Studies in Ancient Civilizations vol.1

Japanese Contributions to the Studies of Mesoamerican Civilizations

: the 40th Anniversary of La Entrada Archaeological Project

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2023

Institute for the Study of Ancient Civilizations and Cultural Resources

Kanazawa University

Editing Note:
The volume is published for the 40th anniversary of the *La Entrada* archaeological project. Furthermore, it commemorates Prof. Seiichi Nakamura's retirement from Kanazawa University. The two commemorated events coincided this year. However, Prof. Nakamura WILL continue to do work in archaeology in the future.

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First published on March 15th, 2023
Editors: Seiichi Nakamura, Takuro Adachi, and Masahiro Ogawa
Layout and Design: Takuro Adachi
Publisher: Institute for the Study of Ancient Civilizations and Cultural Resources,
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Printed by MAEDA PRINTING CO., LTD

ISBN 978-4-944014-37-8

Printed in Japan

Importante aporte del Sr. Seiichi Nakamura para salvaguardar el patrimonio cultural de Mesoamérica

Yuji Seki

Creo que conocí al Sr. Seiichi Nakamura en el Departamento de Antropología Cultural del Campus Hongo de la Universidad de Tokio. Por aquel entonces yo era profesor asistente, y el profesor Yoshio Onuki me presentó al Sr. Nakamura, que acababa de graduarse en la Universidad de Kanazawa y al Sr. Takeshi Inomata, que era estudiante en la Universidad de Tokio (actualmente profesor en la Universidad de Arizona). En aquel momento, ambos estaban a punto de embarcarse en un proyecto de investigación y conservación en el sitio arqueológico de La Entrada, en Honduras. En el Departamento de Antropología Cultural, el profesor Yoshiro Masuda y el profesor Onuki habían estado apoyando el Programa de Voluntarios Japoneses para la Cooperación con el Extranjero de la JICA al que fueron enviados el Sr. Nakamura y el Sr. Inomata, por lo que creo que la reunión con ambos estaba concertada.

Debo confesar que sentí envidia. Por supuesto, yo había visitado Perú en Sudamérica cinco años antes que ellos para excavar sitios arqueológicos. La Universidad de Tokio tiene una larga historia de expediciones arqueológicas a civilizaciones andinas, que se iniciaron en 1958, y yo fui uno de los últimos en salir de allí. Sin embargo, por encima mío había destacados profesores, y en aquel momento casi me aplastaba la presión. Por eso anhelaba verlos desplegar sus alas hacia tierras desconocidas sin la guía directa de nadie.

Sin embargo, cuando pienso en ello, no creo que la presión que sintieron estos jovenes arqueólogos fuera comparable a la mía. Ellos tuvieron que enfrentarse de repente a una civilización desconocida, sin una brújula a la que remitirse. Tengo que quitarme el sombrero ante sus esfuerzos por superarlo y convertirse en la base de la investigación actual en Japón.

Hasta entonces, la arqueología en Mesoamérica se había centrado principalmente en México y Guatemala, donde habían trabajado varios arqueólogos japoneses, entre ellos los doctores Eiichiro Ishida, Tomohiro Takayama y Kuniaki Oi, pero los resultados de la investigación andina en Sudamérica eran aún más destacados. En este contexto, el Sr. Nakamura y sus colegas trabajaron en el proyecto arqueológico La Entrada (1984-1994), en Honduras. El núcleo del proyecto era la excavación y conservación del sitio arqueológico de El Puente. Posteriormente, el proyecto contó con la participación de varios arqueólogos jóvenes y dio lugar a algunas de las figuras más destacadas de los estudios mayas actuales. Es posible que algunos de los colaboradores de esta publicación también sientan que se han beneficiado del Sr. Nakamura.

Al principio del proyecto, Guatemala, centro de la arqueología maya, estaba sumida en una guerra civil que dificultaba la investigación arqueológica. El interés se centró en los alrededores de los mayas, incluso por parte de investigadores occidentales, lo que a su vez fomentó una visión global de la arqueología maya. El proyecto arqueológico de La Entrada estuvo realmente a la vanguardia de la arqueología mesoamericana. Sin embargo, el Sr. Nakamura y sus jóvenes compañeros investigadores no solo fueron pioneros en la región maya oriental desde el punto de vista académico, sino que también participaron en la formación de sus sucesores.

Otro de los logros del Sr. Nakamura para la comunidad arqueológica latinoamericana fue la creación de una sociedad académica en Japón (la Sociedad Japonesa de Estudios sobre la América Antigua). Aunque debería haber sido iniciada por un investigador andino con una larga historia de investigación, fue el Sr. Nakamura quien propuso por primera vez la necesidad de una organización de investigadores para la arqueología latinoamericana en Japón. Su clarividencia al ver la necesidad de una organización de este tipo, que ahora cuenta con un centenar de miembros y celebra cada año una exitosa conferencia de investigación, merece un reconocimiento mucho mayor.

Al examinar los logros del Sr. Nakamura hasta la fecha, uno de los más notables es su activa participación en la conservación del patrimonio cultural. Tras el proyecto de La Entrada, el Sr. Nakamura promovió el Proyecto Integral para la Conservación del Parque Arqueológico de Copán (1999-2002), inscrito como Patrimonio Mundial por la UNESCO. Allí trabajó en la conservación de zonas excavadas que habían quedado desatendidas tras las investigaciones realizadas por los arqueólogos extranjeros, aprovechando el marco del envío de expertos y subvenciones culturales de la Fundación Japón. Le siguió el Proyecto Arque-

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ológico Copán (2003-2009), apoyado por la Fundación Japón, la Fundación Sumitomo y la Universidad de Waseda. Además, en 2017 se inauguró el Centro de Formación y Conservación del Patrimonio Cultural en Copán Ruinas, que también fue posible gracias a que el Sr. Nakamura pudo obtener financiación del Fondo Contravalor Honduras-Japón a través de la Cooperación No Reembolsable Non-Project.

Esto por sí solo demuestra cómo el Sr. Nakamura no solo se ha integrado en la sociedad local y ha sacado a relucir las necesidades locales, sino que también ha recaudado fondos de diversas organizaciones internacionales. La cooperación internacional en materia de patrimonio cultural abarca una amplia gama de ámbitos, entre ellos la conservación y utilización del patrimonio en cuestión y la formación de los expertos. Normalmente se necesita una gran organización para llevar a cabo una amplia gama de proyectos de patrimonio cultural, incluida la investigación, pero el Sr. Nakamura se las ha arreglado para hacerlo todo él solo. El alto nivel de su capacidad merece una mención especial.

El Sr. Nakamura también dirige otro proyecto en Guatemala. Gracias a la cooperación del Gobierno japonés, en 2012 se completó la construcción del Centro de Conservación e Investigación de Tikal ubicado en el Parque Nacional de Tikal. Además, este centro no se ocupa solo de Tikal, sino que toda la zona de la civilización maya está en el centro de sus actividades. En concreto, ha desarrollado y puesto en marcha un programa de formación para especialistas en la civilización maya fuera de Guatemala. Se está convirtiendo en un modelo de la llamada cooperación Sur-Sur, con el establecimiento de vínculos con los Parques del Patrimonio Mundial de la UNESCO en Guatemala, Honduras y El Salvador. Además, con el apoyo del Fondo Fiduciario UNESCO/Japón, se ha iniciado un estudio en mediciones 3D del complejo arquitectónico conocido como la “Acrópolis Norte” del sitio de Tikal.

El Sr. Nakamura se va a jubilar de la Universidad de Kanazawa. Es una gran pérdida, pero no cabe duda de que la red que estableció en Mesoamérica es un tesoro para la Universidad de Kanazawa. Hasta ahora, los proyectos han dependido en gran medida del Sr. Nakamura personalmente para su ejecución y obtención de resultados, pero será misión de sus sucesores continuar su legado y herencia, y seguir desarrollando esta red como organización permanente.

Con el Sr. Seiichi Nakamura (derecha) en el sitio arqueológico de Copán (2007)

Japanese Contributions to the Studies of Mesoamerican Civilizations

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S. Nakamura, T. Adachi, and M. Ogawa (eds.), *Japanese Contributions to the Studies of Mesoamerican Civilizations*, pp. 1-7, Institute for the Study of Ancient Civilizations and Cultural Resources, Kanazawa University, Japan, 2023, ISBN 978-4-944014-37-8.

Reseña del Proyecto Arqueológico La Entrada (Primera Fase 1984-1989, Segunda Fase 1990-1994)

Seiichi Nakamura

INTRODUCCIÓN

Hace 40 años, en julio de 1983, Takeshi Inomata (actualmente profesor de la Universidad de Arizona) y el autor de este resumen fueron enviados a Honduras como arqueólogos voluntarios del Servicio de Voluntarios Japoneses para la Cooperación con el Extranjero (JOCV) de la Agencia de Cooperación Internacional de Japón (JICA). El JOCV de JICA y la Embajada de Japón en Honduras estaban considerando en aquel momento formar un nuevo proyecto arqueológico de parte de Japón desde el marco de la cooperación internacional para Honduras. Después de un año de realizar varios preparativos, en julio de 1984 inició la primera fase del Proyecto Arqueológico La Entrada, un proyecto conjunto entre el Instituto Hondureño de Antropología e Historia (IHAH) y el JOCV de JICA en Honduras con el propósito de investigar y conservar los sitios arqueológicos en la región de La Entrada y llevar a Honduras nuevas tecnologías en arqueología para la formación y capacitación de personal técnico hondureños. Esta primera fase fue financiada por el JOCV de JICA (1984-1989) y la Fundación Mitsubishi (1984-1986). En esta fase participaron 10 arqueólogos japoneses, entre ellos Etsuo Sato (actualmente profesor de la Universidad Internacional de Toyama) y Kazuo Aoyama (actualmente profesor de la Universidad de Ibaraki). A través de las actividades que se realizaron como parte del proyecto se obtuvieron abundantes y notables resultados.

LA REGIÓN DE ESTUDIO

La región de estudio de este proyecto está localizada en el área occidental de la República de Honduras que está formada por los valles de La Venta y Florida y sus corredores naturales y cubre una extensión aproximada de 150 km². La mayor parte del área de investigación la comprenden los departamentos de Copán y la parte noroeste del departamento de Santa Bárbara. Dentro de lo que fue el territorio Maya, esta área es de mucha importancia arqueológica y en ella no se había ejecutado ninguna investigación sistemática hasta el comienzo de este proyecto. El inicio de las investigaciones de la Primera Fase del proyecto se orientó conforme al deseo del IHAH de ampliar los datos obtenidos de Copán y de las regiones que supuestamente estuvieron bajo su dominio para conectarlos con los datos de los proyectos arqueológicos de Sula, Santa Bárbara y El Cajón que fueron realizados en la segunda mitad de la década de 1970 y en la primera mitad de la década 1980.

ACTIVIDADES Y RESULTADOS DE LA PRIMERA FASE DEL PROYECTO (1984-1989)

1. Reconocimiento

Se realizó un trabajo de exploración y reconocimiento que cubrió la totalidad del área de investigación, fue posible localizar y registrar 689 sitios arqueológicos.

2. Levantamiento topográfico y mapeo

Se realizó la labor sistemática de mapeo y levantamiento topográfico de aquellos sitios arqueológicos registrados con montículos visibles (aproximadamente 400 sitios, el 60% del total de sitios registrados) y se elaboraron planos a escala 1/500 y 1/1000.

3. Programa extensivo de pozos de prueba.

Se llevó a cabo un programa extensivo de pozos de prueba en 35 sitios arqueológicos seleccionados al azar con el fin de buscar una muestra representativa de la cultura prehispánica del área y de recolectar datos sobre la cronología de la región de La Entrada. Fue posible confirmar una ocupación humana desde el periodo Preclásico Medio hasta el periodo Clásico Tardío Terminal (900 A.C. - 900 D.C.). Esta región era de mucho interés porque está situada en una frontera Maya-No Maya que recibió una influencia cultural muy fuerte de Copán durante el último periodo antes mencionado.

4. Análisis de artefactos y ecofactos recolectados

Todo material arqueológico recolectado (artefactos y ecofactos) –piezas de cerámica, lítica, piedra esculpida, barro quemado, huesos de animales, entierros– fue registrado y analiza-

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do en el laboratorio del proyecto.

5. Publicación del informe final

Los resultados de las investigaciones y de los estudios arriba mencionados se publicaron en español en revistas del IHAH. El Informe final de las investigaciones de la primera fase de este proyecto, *Investigaciones arqueológicas en la región de La Entrada. Tomo I, II y III* [Nakamura et al. eds. 1991], fue publicado por la editorial Sonapa en San Pedro Sula y contiene el conjunto de mapas y el levantamiento topográfico realizado.

6. Fundación del Museo Arqueológico La Entrada.

Con el propósito de divulgar los resultados de las investigaciones y estudios del proyecto, mediante la asistencia técnica y financiera del JOCV de JICA y la colaboración de la Municipalidad de La Entrada, el IHAH fundó el 1 de agosto de 1987 el primer museo de La Entrada. Cabe destacar que en este museo están en exhibición no solamente piezas arqueológicas de Honduras sino también artefactos arqueológicos de Japón que fueron donados por el Museo Regional de Akita, Japón, como un símbolo de amistad entre el pueblo hondureño y el pueblo japonés. Posteriormente, este museo fue remodelado y el contenido de sus exposiciones fue actualizado con el fin de exhibir los hallazgos realizados en el sitio arqueológico El Puente durante la segunda fase de este proyecto. Con la asistencia financiera del gobierno de Japón, este museo fue reinstalado en 2014 en el Centro de Visitantes del parque arqueológico El Puente para servir como museo del sitio.

7. Conferencias arqueológicas

Numerosas conferencias han sido presentadas por los investigadores de este proyecto en los seminarios y simposios de arqueología hondureña organizados por el IHAH y la Universidad Nacional Autónoma de Honduras o por instituciones educativas como la Alianza Francesa con el fin de divulgar los resultados de las actividades del proyecto, hacer un aporte al conocimiento del patrimonio arqueológico de Honduras y

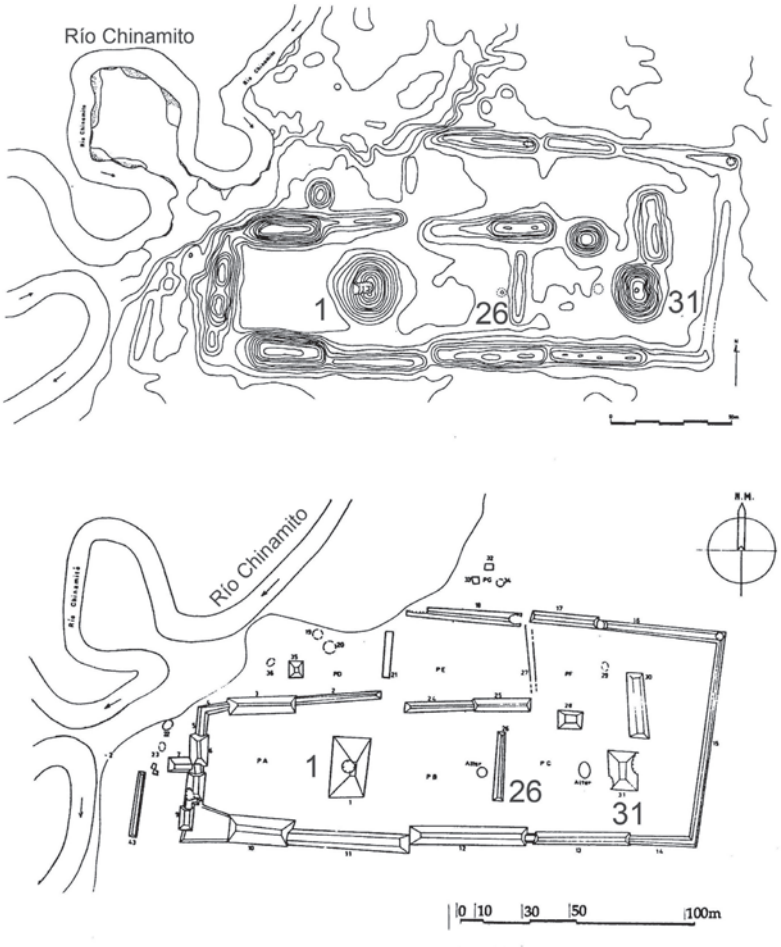

Fig. 1. Arriba: Mapa con curva de nivel del grupo principal de El Puente, Abajo: Mapa planimétrico del grupo Principal de El Puente

concientizar a las personas sobre la necesidad de preservarlo y utilizarlo como un recurso cultural propio.

ACTIVIDADES Y RESULTADOS DE LA SEGUNDA FASE DEL PROYECTO (1990-1994)

La segunda fase de este proyecto fue diseñada y presentada por el autor a las autoridades de ambos países. La aprobación se obtuvo finalmente a finales de 1989 y se firmó un convenio bilateral entre el gobierno de Honduras y el de Japón. En la segunda fase del proyecto, además de cumplir con objetivos de carácter científico, se decidió concentrar las investigaciones arqueológicas y la posterior restauración de las estructuras en el sitio El Puente con el fin de crear en ese entonces el segundo parque arqueológico nacional de Honduras después de Copán. Se esperaba que ese parque fuera un disparador y un estímulo para el desarrollo regional.

El sitio El Puente (Fig. 1) fue elegido para esas investigaciones porque está situado en el Municipio de La Jigua, Copán, aproximadamente 2 km al norte de la confluencia de los ríos Chamelecón y Chinamito. Este sitio fue sin duda un centro regional importante en el valle de Florida durante el periodo Clásico tardío (600-900 D.C) y posee una impresionante estructura piramidal de 12 metros de altura (Estructura 1; Foto 1), dos altares, varias esculturas, un monolito zoomorfo de un jaguar y, según [Yde 1938:56], esculturas mosaicas posiblemente con fragmentos jeroglíficos y con una señal de ahau. En marzo de 1989 esta zona arqueológica fue declarada Patrimonio Cultural de la Nación por el entonces Presidente de la República Ing. José Azcona Hoyo. Excavaciones extensivas e intensivas en las principales estructuras de este sitio fueron llevadas a cabo (Foto. 2). En 9 de ellas se concluyeron las investigaciones (Estructuras 1, 3, 4, 5, 10, 26, 31, 204 y 205) y se terminaron también sus respectivos trabajos de restauración (Fotos 3 y 4). Asimismo, se investigaron y se restauraron dos pequeños altares: el Altar I de la Estructura 26 y el Altar II de la Estructura 31.

Los resultados más importantes del trabajo fueron el descubrimiento de dos estelas sin inscripciones, entierros importantes de las élites con ofrendas de jade y vasijas de cerámica. En las excavaciones de salvamento llevadas a cabo en el lugar donde se construyó el Centro de Visitantes se encontraron, además, cuatro

Foto 1. La Estructura 1 en estado de montículo antes de la excavación (Enero de 1985)

Foto 2. La Estructura 1 en proceso de excavación y restauración (1992)

Foto 3. La Estructura 1, Estructura 26, Altar II, Estela II después de restauración (1995)

Foto 4. La Estructura 26 y Estructura 31 después de restauración (1995)

Foto 5. Centro de Visitante del Parque Arqueológico

entierros en muy buen estado de conservación, dos de ellos con ofrendas que consistían en vasijas de cerámica, una de las cuales tenía inscripciones jeroglíficas de la secuencia normal primaria.

Entre otras actividades que se llevaron a cabo por los miembros japoneses del JOCV de JICA y sus contrapartes hondureñas se pueden mencionar el diseño de instalaciones y facilidades para el parque arqueológico (siembra de árboles, diseño de señalización, habilitación de senderos, etc), la construcción del Centro de Visitantes (Foto 5) y la de un edificio de 216 m² para almacenar el material arqueológico proveniente de las excavaciones. Los encargados de la sección de educación audiovisual del proyecto se encargaron de hacer un registro filmado de éstas y de otras actividades del proyecto. Los resultados de las investigaciones de esta segunda fase se publicaron en conferencias, simposios, tesis y artículos en la prensa y en revistas especializadas.

Medidas preventivas para la protección y conservación de las estructuras de este parque arqueológico y de sus monumentos que buscaban evitar que las crecidas de los ríos las dañaran o las deterioraran se han implementado –especialmente para aquellas cercanas al Río Chinamito (ver Fig. 1). De igual manera se tomaron medidas para proteger la bolsa que forma el curso de este río para que fuera un lugar de descanso, recreación y esparcimiento para el visitante.

Para el desarrollo de la segunda fase y de las actividades de cooperación, los gobiernos de ambos países acordaron la siguiente distribución del trabajo y de las responsabilidades:

De parte de JICA:

1) Dirección de actividades y cooperación técnica durante el desarrollo de la investigación arqueológica y la restauración y conservación de las estructuras excavadas en el sitio arqueológico El Puente; diseño y construcción del segundo parque arqueológico nacional en el mismo sitio; investigaciones ecológicas, geológicas y botánicas; análisis de laboratorio, registro y filmación de las actividades arriba mencionadas. Entre los arqueólogos enviados de parte del JOCV de JICA en esta fase se encuentran Kazuo Aoyama, Etsuo Hasegawa (actualmente profesor de tiempo parcial de la Universidad de Saitama) y Shuichiro Terasaki (actualmente profesor de la Universidad Waseda). El autor de este resumen ha sido el director de dos fases del proyecto.

2) Apoyo a las actividades de concientización del pueblo en general sobre la necesidad de conservar y preservar los bienes culturales y utilizarlos como recursos culturales propios para su desarrollo.

3) Elaboración de informes periódicos y finales sobre las investigaciones del proyecto.

4) Proporcionar todos los equipos y materiales necesarios para las actividades arriba mencionadas.

Por su parte, a través del IHAH, el gobierno de Honduras adquirió los siguientes compromisos:

1) Asignación de una contraparte para cada técnico japonés del JOCV de JICA.

2) Coordinación con las universidades nacionales y privadas para que profesores y estudiantes de carreras afines participen en las actividades del proyecto.

3) Sufragar los gastos locales necesarios para la realización del proyecto tales como mano de obra, salarios del personal técnico hondureño, combustible, etc.

4) Proveer gastos de vivienda para los técnicos japoneses asignados al proyecto.

El parque arqueológico El Puente abrió sus puertas al público en enero de 1994, está en este momento cumpliendo 29 años. Durante todo este tiempo, este parque arqueológico ha sido un centro de recreación familiar, un importante centro educativo de la historia prehispánica para los estudiantes hondureños y también un atractivo turístico de esta región en las rutas terminales del proyecto turístico multinacional del Mundo Maya. Este parque ha sido además un foco de intercambio cultural y académico entre estudiantes universitarios hondureños y japoneses. El gobierno de Japón ha continuado con su apoyo durante los años que siguieron al proyecto y ha colaborado en la remodelación del Centro de Visitantes, así como en la de la sala de exposiciones del museo del sitio con una sala de realidad virtual. Las investigaciones arqueológicas en este sitio las continuarán

los arqueólogos de la siguiente generación.

CONTRIBUCÍON DEL PROYECTO ARQUEOLÓGICO LA ENTRADA

Hace 40 años, cuando Takeshi Inomata y el autor de este resumen fueron enviados a Honduras, no existía en ninguna universidad en Japón una tradición académica de arqueología mesoamericana. Existían pocos arqueólogos japoneses –Saburo Suguiyama, Akira Kaneko y Kuniaki Ohi, por ejemplo– que realizaban investigaciones arqueológicas en México, pero todos habían cruzado el océano Pacífico por sí mismos de manera individual e independiente. En contraste con las investigaciones andinas de Sudamérica que contaban ya con una tradición académica establecida por los profesores de la Universidad de Tokio, en el área maya no existía ningún fundamento para realizar ninguna investigación. Por esa razón, pienso que combinar la arqueología con la cooperación técnica internacional fue la única y la mejor manera para poder realizar lo que hicimos en el área maya. El Proyecto Arqueológico La Entrada se convirtió literalmente en "la entrada" de los arqueólogos japoneses a la arqueología maya. Su contribución a la formación de los investigadores mayistas japoneses es muy grande. Para este momento, la siguiente generación de arqueólogos mayistas japoneses ya ha sido formada en alguna universidad en Japón.

Cabe mencionar que en cuanto a la formación de los técnicos hondureños del IHAH, el proyecto arqueológico La Entrada también ha hecho una contribución importante. Salvador Varela, Mélvin Fuentes, Norman Martínez, Carlos Carbajal, Santiago Escobar, Enrique Sanabria, etc. –todos ellos del IHAH– fueron formados en este proyecto.

Hace 40 –años y aún ahora– en el mundo académico mayista todavía existe una duda para admitir que la arqueología puede contribuir significativamente al desarrollo de un país a través de la utilización de sus recursos culturales. Un sitio arqueológico es un recurso cultural muy importante para un país que está en vías de desarrollo. Utilizarlo apropiadamente puede contribuir enormemente con el desarrollo regional. En este sentido, el Proyecto Arqueológico La Entrada nos enseñó lo que podemos dejar como legado en el país receptor tal como Honduras en un plan de mutuo beneficio si la arqueología se une a la cooperación económica internacional. La historia de la cooperación japonesa luego de este proyecto continuó y continúa aún bajo este con-

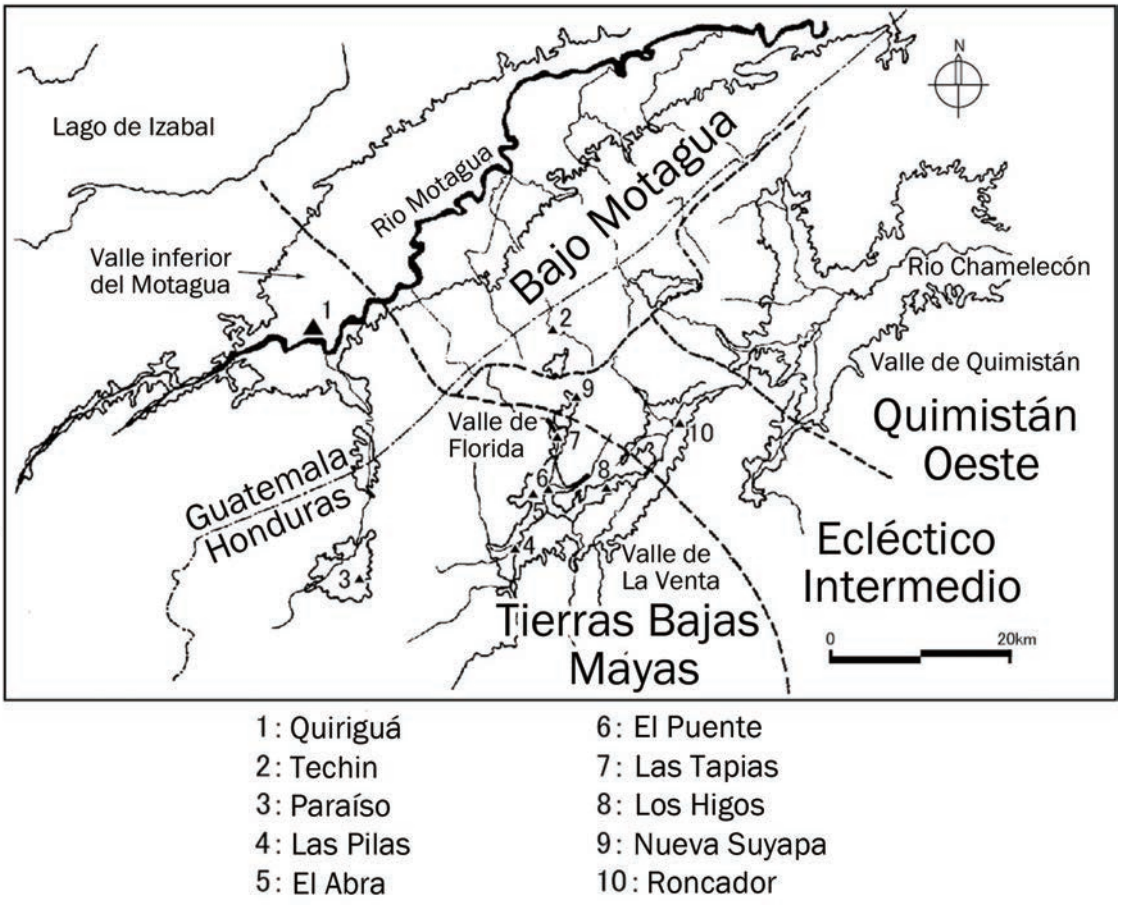

Fig. 2. Patrones de la cultura material en la región de La Entrada y sus áreas adyacentes

Foto 6. Las esculturas mosaicas del posible gobernante local que adornaban la estructura principal de Las Pilas, centro secundario en el valle de Florida

cepto en Copán, el sitio de Patrimonio Mundial, con la creación de una nueva área de visita dentro del parque, la restauración y conservación de las estructuras, el equipamiento de las salas de exhibiciones de los museos. Toda esta labor se ha ejecutado con el fondo para el desarrollo socioeconómico de la cooperación internacional y con el fondo de beca para la investigación científica. Ya que se necesitan muchos fondos para los proyectos arqueológicos de restauración y conservación, esta nueva modalidad de financiación en conjunto con la cooperación económica será seguramente la tendencia en la siguiente generación.

Finalmente, ¿qué sugerencias académicas obtuvo el proyecto arqueológico La Entrada en cuanto a la intención inicial de IHAH de ampliar y conectar los datos de Copán con los de Sula, Santa Bárbara y El Cajón? Voy a dejar los detalles para los artículos publicados por los investigadores participantes, sin embargo, puedo sostener que nuestra investigación arqueológica demostró que esta zona fue una encrucijada de varias culturas prehispánicas [Nakamura 1992; Fig. 2]. Debido a esa condición, esta región es un área de investigación con una historia muy compleja y fluctuante. Los gobernantes de los centros secundarios copanecos en la región de La Entrada actuaron quizás muy inteligentemente acomodándose y lidiando con la particular situación política de cada momento en esta área del sureste maya.

El origen de la ocupación humana en esta zona se remonta al período preclásico medio o antes, en las fases cerámicas Uir y Rayo de Copán. Los sitios arqueológicos CP-PLE-16 y CP-PLE-126 son los sitios más representativos de este período, aunque los centros secundarios del período Clásico Tardío tales como CP-PLE-30 (Las Pilas) y CP-PLE-50 (Los Higos) ya estaban también ocupados durante esta época.

Antes de la fundación de la dinastía copaneca en las fases Chabij y Bijac de Copán, se encontraba en esa área el sitio arqueológico Florida (CP-PLE-29), el primer centro importante en la región de La Entrada. Cabe mencionar que este sitio tenía una relación con la tradición cultural de El Salvador y no fue sino hasta después de la fundación de la dinastía maya en el valle de Copán, a 50 km en línea recta, que los sitios de la región de La Entrada fueron gradualmente tragados por la influencia de la cultura maya. Aunque un nuevo estudio interdisciplinario basado en análisis de isótopos estables y paleo-genomas está en progreso, creo que ha habido mucha migración a esta área desde Copán y mucha también de esta área a Copán. Seguramente algunos centros secundarios del valle de Florida fueron fundados directamente por miembros de la élite de la dinastía de Copán.

El periodo en el que los gobernantes de estos centros secundarios de la región de La Entrada fueron más activos duró hasta el período Clásico Tardío, en la segunda mitad de la fase Coner (Coner II), después de 738 d. C. cuando el 13er gobernante de la dinastía copaneca fue capturado y decapitado por K'ak Tiliw de Quiriguá. El proceso de la debilitación del poder centralizado del gobernante copaneco había sido observado en esta área también por los gobernantes de los centros secundarios que adornaban sus edificios igual al palacio del gobernante y al de las élites de Copán (Foto 6). Esto quiere decir que el proceso de descentralización del poder político que W. Fash demostró en el valle de Copán [Fash 2001] fue observado también en la periferia del Estado copaneco y esta periferia contribuyó también al colapso de la dinastía.

Aunque se necesita hacer una nueva evaluación de la cronología de la región de La Entrada con base en fechamientos de C14 en una gran escala, puede en general decirse que los sitios de la región de La Entrada decayeron después del colapso de la dinastía copaneca y no tuvieron una ocupación hasta el período Posclásico Temprano [Nakamura 1994].

Ya que el autor de este resumen está actualmente enfocado en la investigación y restauración de los templos 7 y 11 del grupo principal de Copán, la mirada desde el centro hacia la periferia dará una nueva luz a la historia de la región de La Entrada en un futuro.

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El Puente and Copan: From the seventh to the eighth century of the Southeastern Maya Periphery

Etsuo Hasegawa

El Puente is one of the largest pre-Columbian sites in the La Entrada region in the Copan Department, Western Honduras (Figure 1). From the Copan Valley eastward, crossing a watershed, one enters the Florida Valley. El Puente is about 50 km from the famous Copan ruins, the capital of an important kingdom of Classic Maya. About 2 km north of the confluence of the Chamelecon and Chinamito Rivers, more than 150 structures have been confirmed in an area 850 m east to west and 790 m north to south. The site's Main Group is roughly 200 m east to west and 100 m north to south, with many square and long rectangular structures surrounding some plazas (Figure 2). Among them, a 15-meter-high pyramid, Structure 1, and another 5.5-meter-high pyramid, Structure 31, are outstanding. Intensive excavations and restoration work were conducted from 1991 to 1995. The site has been converted into the second national archaeological park in Honduras.

The La Entrada region comprises the Florida Valley and the adjacent La Venta Valley. The former extends northward, and the latter eastward. Further north of the Florida Valley, the route crosses the watershed that is now the Honduras–Guatemala border and reaches the Lower Motagua Valley. Further east from the La Venta Valley, it goes through the Quimistan Valley, Naco Valley, Sula Plain, and Comayagua Valley in Central Honduras. The Florida and La Venta Valleys together have an area of about 140 square kilometers, which is large compared to the Copan Valley, which has an area of 26 square kilometers.

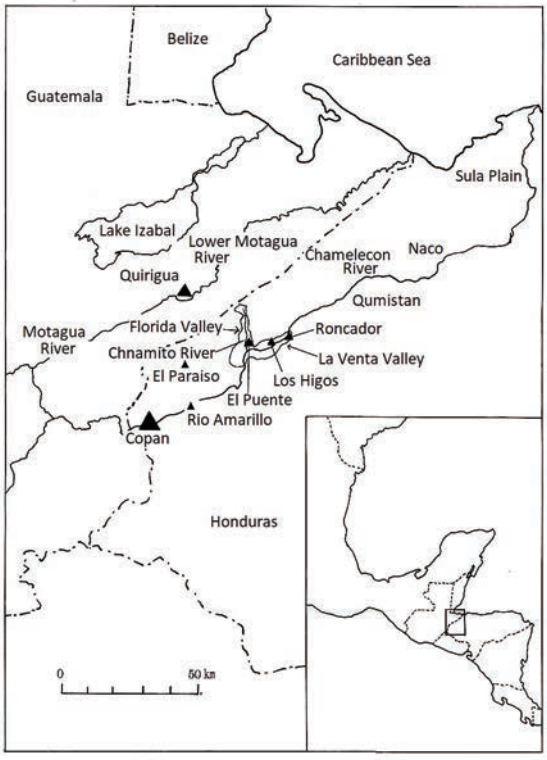

Figure 1 Southeastern Maya Periphery

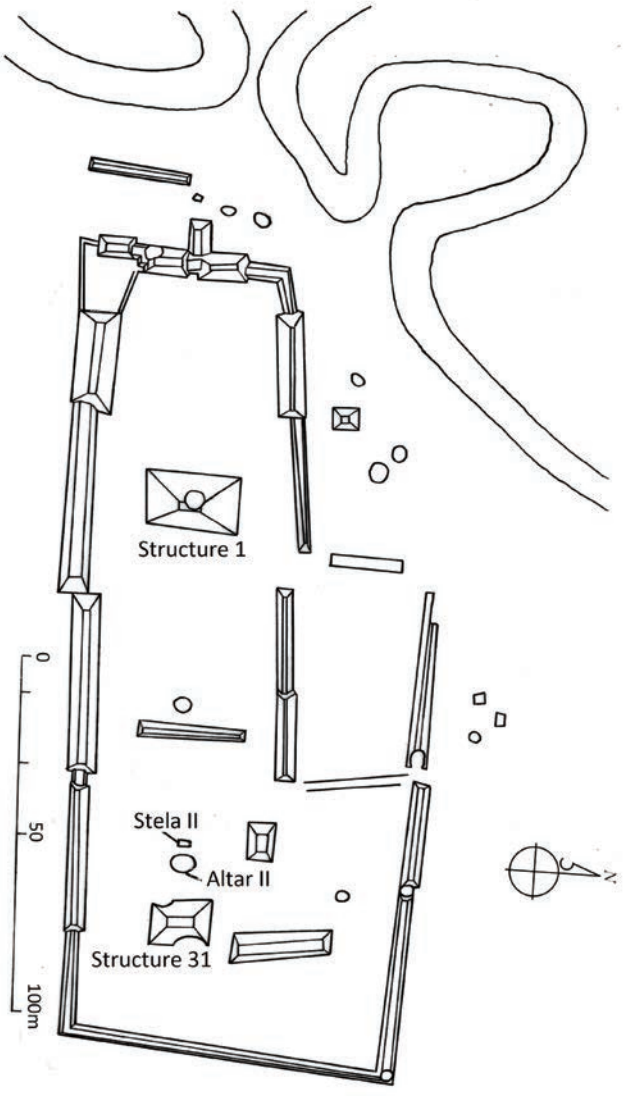

Figure 2 Main Group, El Puente

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In the La Venta Valley, Los Higos and Roncador are the two most prominent archaeological sites along the Chamelecon River. At Los Higos, a stela with Maya inscriptions dated 781 was discovered in the early 20th century [Nakamura 1991:208; Schele 1991]. No stone monuments with Maya inscriptions are reported east from this point. The other principal site, Roncador, is located on the La Venta Valley's eastern edge and has the only known ball court in the La Entrada region [Nakamura et al. 1991:35].

Further east from La Venta Valley, down the Chamelecon River, the sites consist of mounds, at best, 2–3 m high. The architecture is piled-up cobbles and other natural materials. The structures do not surround a square plaza but are irregularly arranged or in a linear pattern.

Only 50 kilometers eastward from Copan, the Maya cultural elements, such as inscriptions, disappear. Furthermore, 10 kilometers east of there, the Mesoamerican elements, such as the cut stone masonry and the site plan in which structures surround the square plaza, also fade out.

In Copan, Yax Kuk Mo founded a dynasty in AD 427, which lasted for about 400 years until its collapse in the early 9th century. In the 7th and 8th centuries, Copan reached its apogee but then suffered defeats and the demise of its king. What were the interests of the Copan kingdom in the land of the east in this period? Who were the people who built El Puente? What kind of interaction did Copan and their eastern neighbors have? This paper focuses mainly on the excavation results at El Puente and considers the relationship between Copan and the Florida Valley.

EXCAVATIONS OF STRUCTURE 31 AND VISITOR CENTER, EL PUENTE

Structure 31 was the second-tallest mound of El Puente [Hasegawa 1993]. After the excavation and restoration, it turned out to be a three-story pyramid with a plan of approximately 18 x 26 m and a height of 5.5 m in its final phase (Figures 3 and 4). In addition, there is a monolith (Stela II) and an altar (Altar II) on its front or west side. The tunnel excavation revealed that its construction sequence could be divided into six phases ("Str. 31-1" the last and "Str. 31-6" the oldest). We also excavated around Altar II and detected two construction stages and the terrace, on top of which the Stela II is erected (Figure5). In the excavation process, we learned about the sequential relationship between each construction phase of Structure 31, Altar II, Stela II, and the terrace (Figure 6).

No diagnostic ceramic type from the Late Classic Period was found in the early phases. So, the construction probably began before AD 700, though this is uncertainly established. The absence of Fine Oranges suggests this structure was abandoned before AD 900.

As to the architectural style, it should be noted that although this structure is a stepped pyramid of cut stones in its final phase, like those of Classic Maya, that was not the case from its beginning. Only after the fourth phase of construction (Str.31-3) is the Copan-Maya-style pyramid built with a stucco floor. Considering that the fifth phase (Str.31-2) is an extension of the first stair of the platform and that the final sixth (Str.31-1) is merely the addition of four small staircases, it can be considered the last one of the four phases. The older structures inside were pulled down, probably to reuse the stone material. Only a few inferior courses of masonry remained, there was no plaster floor trace, and the scale and overall appearance of Structure 31 at early phases are unknown.

Notably, even in the final phase, when the structure had achieved the Copan-Maya architectural style, the building on top of the pyramid was not entirely made of stone. It was far from having wall decorations like stone carvings. We could confirm that the masonry is only up to about 70 cm. Corbel stones, a characteristic of Maya architecture, were not found, suggesting that the upper part of the walls and the roof were made of organic materials. Much burned clay with a flat surface on one side and imprints of plant stems or grass on the opposite side was

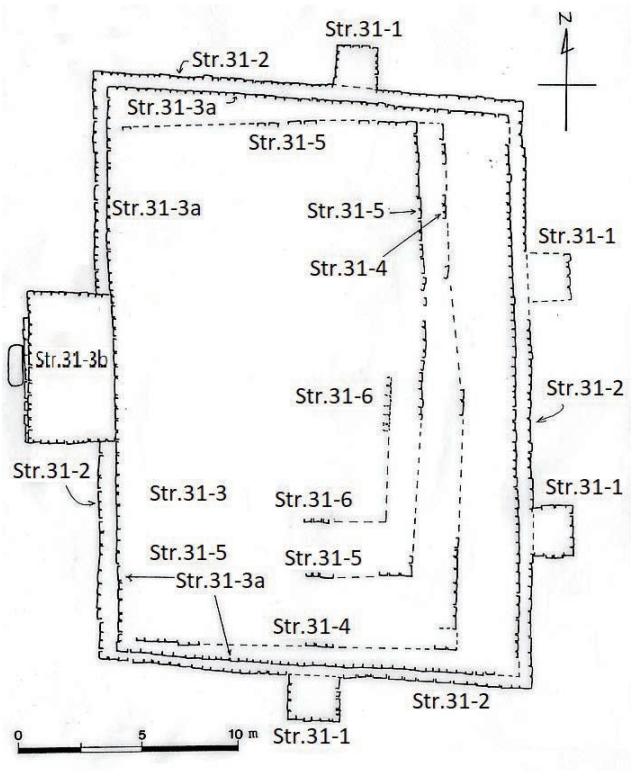

Figure 3 Plan, Structure 31, El Puente

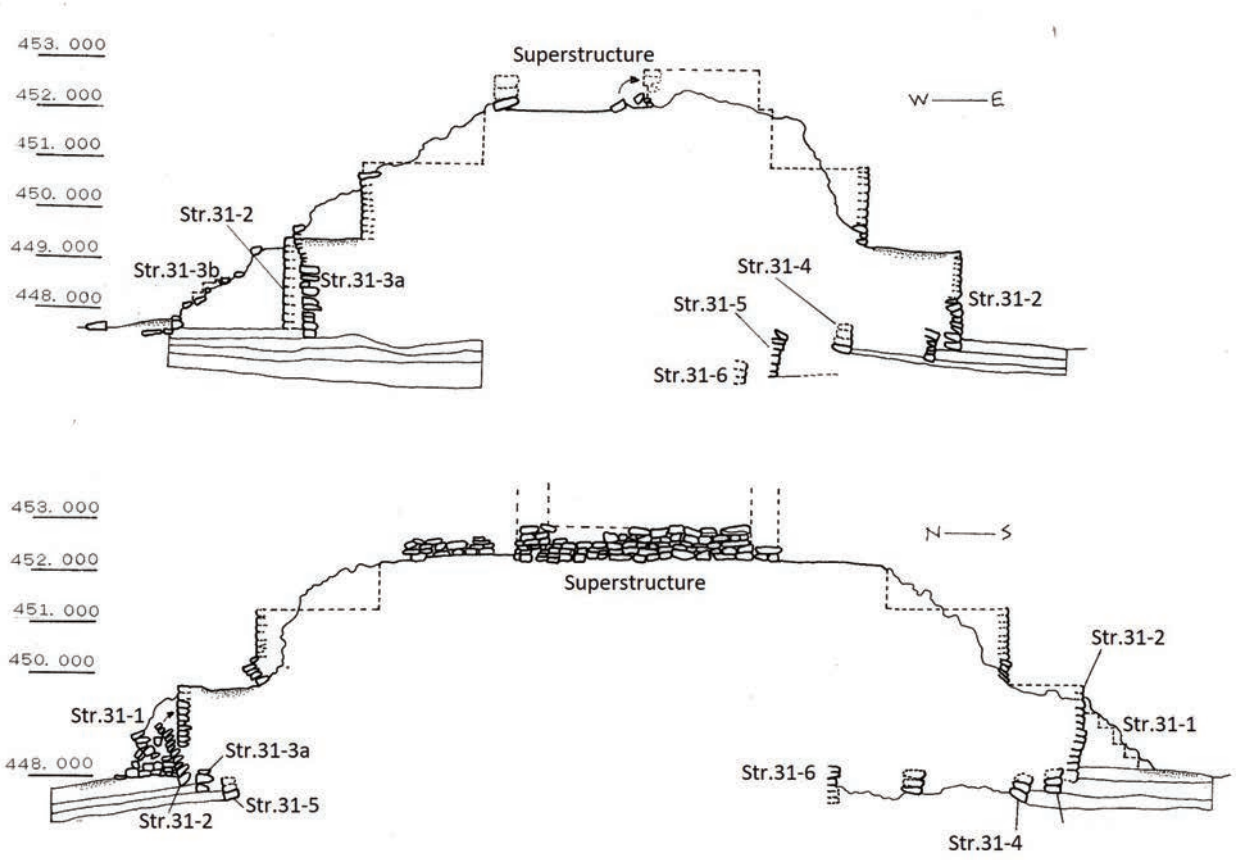

Figure 4 Cross Sections, Structure 31, El Puente

scattered in the area surrounding Structure 31. The wattle and daub building above the structure had been burned off for some reason, and its debris had accumulated.

As mentioned above, Structure 31 has accompanying Stela II and Altar II (Figures 5). These stone monuments are Classic Maya elements. However, Stela II has no carvings except for faint red pigment traces on the surface. So, actually, it should be called a monolith built on a terrace. Altar II is not carved out of a large stone like those of Copan but is a masonry of cut stones. Such an altar or terrace is found at Cerro Palenque in the Sula Plain, far east of the Maya area [Joyce 1991:48–51]. Moreover, these monuments were built in sequence, and Altar II has two building stages. It should be noted that this type of stone monument is quite different from the altars of Copan.

Around Structure 31, good stratigraphical data on ceramics has been obtained due to the overlapping layers formed by floor renewals. These materials show that the lower layers are dominated by local potteries of the Florida Valley, while in the upper layers, Copan-Maya types increase. Also, many incense burner fragments with thorn-shaped prongs were recovered, which, together with the "stela"-altar complex, suggests this structure's function. The pottery will be discussed more later.

Finally, test pit excavations were conducted before constructing the archaeological park's visitor center located some 500 meters southeast of the Main Group of El Puente [Hasegawa and Varela 1993]. Some ceramic sherds of mammiform support recovered in this survey can date from Late Preclassic to Early Classic Period, indicating human occupation at El Puente before AD 400, which is long before the construction of Structure 31 began. Their descendants, local people of the Florida Valley with different cultural affiliation from the Maya, possibly started to build the Main Group of the site.

EXCAVATION OF STRUCTURE 1, EL PUENTE

Here we overview the excavation of Structure 1, El Puente's largest pyramid [Terasaki 1996]. In keeping with the purpose of this paper, to discuss the beginning of Main Group's construction, the following description focuses on the oldest phase of this structure.

Structure 1, the largest mound of El Puente with 15-meter height, turned out to be a six-story pyramid with a plan of about 27 x 19 m and a height of 12 m with the debris of its superstruc-

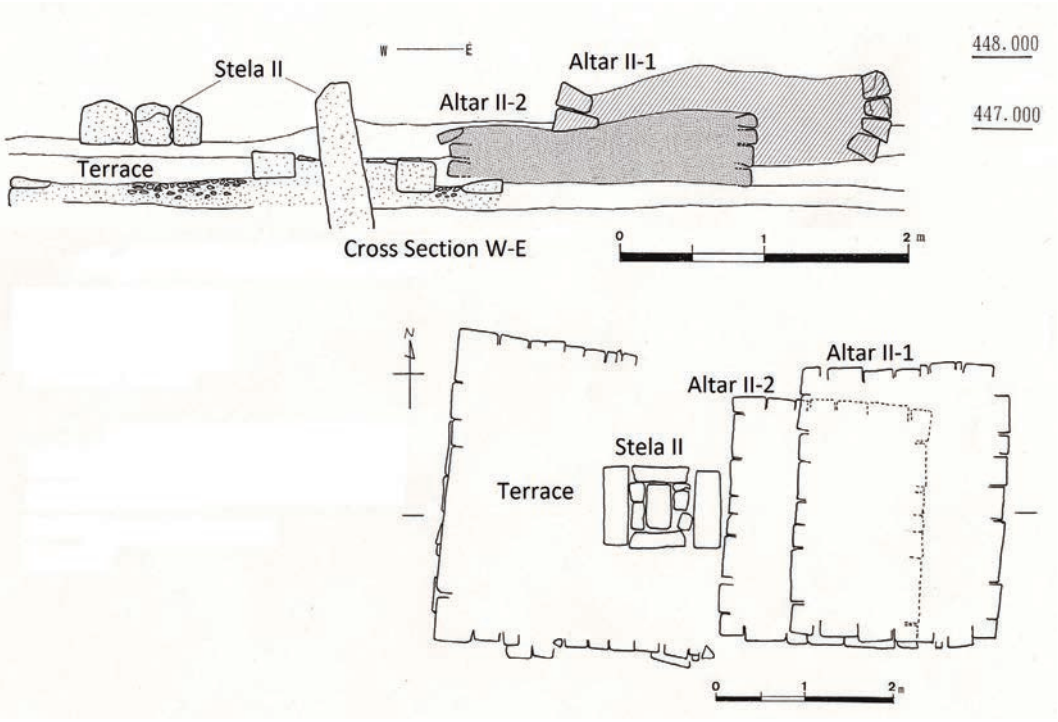

Figure 5 Cross Section and Plan, Stela II, Altar II and Terrace, Structure 31, El Puente

ture, including corbel stones. The structure's interior was also investigated to search for its earliest phase (hereafter abbreviated as "Phase 6"), and a burial ("Tomb 3") was found inside. It has a plan of about 16 x 8 m and is characterized by the coarsely worked stone, hard fine construction fill, and clay overlay on the exterior wall surfaces. The superstructure is surrounded by walls on all sides and has two entrances. According to the investigators, this platform is similar to Chorcha, the 7th century Copan architecture.

Around Tomb 3, some funerary goods possibly associated with it were found. Among them, the lid of an incense burner with human effigy is impressively similar to those recovered from Burial XXXVII-4, a royal tomb discovered inside Chorcha [Fash 2001: 109]. In addition to the architectural resemblance, the ceramic sherds collected from the fill of this earliest structure include a certain amount of Copan-polychromes.

Based on these findings, Nakamura [1995:4, 8] suggests that the sudden appearance of Copan-like architecture at El Puente in the 7th century was not an imitation by the locals. Instead, this reflects the Copan dynasty's colonial policy for dominating the Florida Valley through the enclave. In charge of the investigation, Terasaki [1998:76] states that Phase 6 was constructed by a group strongly affiliated with Copan.

EL PUENTE AND COPAN

The investigation of Structures 1 and 31 generated two conflicting hypotheses. One says a long-established indigenous group initiated El Puente's construction. The other says this was due to Copan's direct intervention.

Did Copan-Maya-like architecture "suddenly" appear?

No traces corresponding to the old occupation of El Puente's surrounding parts were found in the Main Group. That the earliest phase of Structure 1 has Copan-Maya elements may suggest a disconnect between the beginning of the construction of the Main Group and the older, presumably non-Maya, inhabitants.

A question remains whether Phase 6 is the oldest structure in the Main Group, El Puente. Since this was unearthed at the largest pyramid's deepest part and was built on the river sediment, this structure might be the oldest. However, the possibility of having even earlier structures inside cannot be ignored because the tunnel was not completely excavated [Terasaki 1996: 28–34].

Together with Phase 6, a candidate for the Main Group's earliest construction is Str. 31-6 (Figures 3 and 4). In this case, it must be the oldest of Structure 31 because the tunnel was bored through Str. 31-6 in the east-west direction along its central axis, and no traces of construction were found inside. The chronological relationship between Phase 6 and Str. 31-6 is unknown. We could not find the sequential relationship between both pyramids stratigraphically. They are more than 100 m apart, and the soil layers between them are very shallow and unclear.

Notably, while some pottery sherds were recovered in the Phase 6 fill, none were found inside Str.31-6. Their presence in-

dicates human activity before Phase 6 that resulted in depositing these artifacts. In this regard, Str.31-6 may be older.

The author once saw Phase 6 when visiting El Puente in 1994. It can be said that, at first glance, the stones of Phase 6 have faces, though roughly worked. On the other hand, Str.31-6 is the masonry of rubbles with no processing trace, indicating different architectural techniques. In addition, Phase 6's fill is made of "fine and compact clay" with no gravel mixed in [Terasaki 1998:75]. In contrast, the fill of Str.31-6 is also without stones, but it is not particularly refined compared to later construction phases. The fine clay overlaid on the walls of Phase 6 was not detected in Str.31-6. The only similarity between the two constructions may be the pavement stone slabs around the structure.

In fact, Phase 6 is similar to Copan's 7th century architecture. However, Str.31-6, which is as old or possibly older, has different architectural features. We can not conclude that Copan-like architecture suddenly appeared at El Puente. Perhaps diverse architectural styles existed early in the Main Group's construction sequence.

Ceramics from the early phases of Structure 1 and Structure 31

Among the 4,505 sherds collected from Phase 6's construction fill, 383 were fine ceramics, and 88 were Copan-type painted potteries [Terasaki 1996: 50–61]. This could suggest that the Main Group's construction was abruptly initiated by Copan migrants.

Meanwhile, the potteries collected from the area surrounding Structure 31 present different aspects. Two ceramic types drew our attention. These are Colinas Brown and Entrada Micaceous, both with distinctive pastes. Colinas Brown comprises large jars and bowls with thick walls of a sandy but compact orange-to-brown paste with inclusions of 2–3 mm pebbles [Sato 1991a: 4, 1993:23]. This pottery is abundant in the northeastern La Venta Valley and the northern Florida Valley. It is also present in the Lower Motagua Valley and is called Vitales Thick-Walled [Schortman 1984:476–478]. The other type, Entrada Micaceous, is jars with brown paste with a high amount of mica fragments [Sato 1991a: 4–5, 1993:23–24]. It is found throughout the Florida Valley and is called Mojanal Micaceous in the Lower Motagua Valley [Schortman 1984:464–474]. They both date from the Late Classic Period in the La Entrada area.

According to the preliminary analysis of the ceramic samples recovered around Stela II and Altar II by the author, Vitales Thick-Wall is abundant in Levels 6 to 8, accounting for over 10% of the rim sherds. These layers correspond to Str. 31-3, Str. 31-4, the early construction of Altar II, Stela II, and its terrace (Figure 6). Later, its percentage goes decreasing at the upper layers. Meanwhile, the polychromes, many of which are Copan types like Copador or Gualpopa, also begin to appear from Level 6, but they account for less than 5% of the rim sherds. Later, in Level 3, the construction fill under the floor surface of the final phase, they reach over 5% of the rim sherds and arrive at the

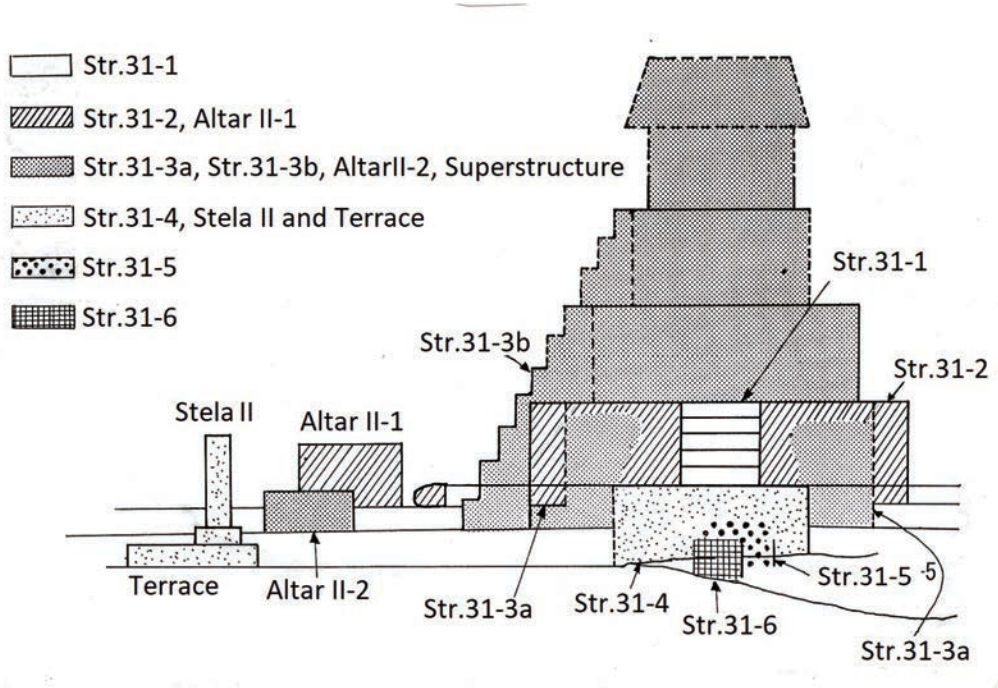

Figure 6 Construction Sequence, Structure 31, Stela II, Altar II and Terrace, El Puente

highest rate, more than 10%, in Level 1, the soil deposited above the last floor surface. In addition, Entrada Micaceous continues to be found from the lower to the upper levels consistently in constant quantity.

It is important to note that Colinas Brown and Entrada Micaceous are non-Maya ceramic types. The former is distributed somewhat exclusively with Tango Brown, which is similar to Zico, a domestic ceramic type of Copan [Sato 1991a:13]. The latter, a common type in the Florida Valley, represents more than half of the ceramics collected in the Lower Motagua Valley [Schortman 1984:464–474].

In the same El Puente Main Group, while Copan-polychromes are found in the earliest Structure 1 construction, non-Maya local potteries are dominant in the early stages of Structure 31. The following hypotheses are possible for this inconsistency: 1) A chronological difference exists. Structure 31's early stages predate Phase 6. 2) The people who built Structures 1 and 31 belonged to two groups with different cultural affiliations. 3) Different socioeconomic groups occupied Structures 1 and 31. Therefore, the potteries' differences reflect the groups' activities, economic wealth, or both. Before we discuss this further, let us look at another issue.

Phase 6 and Chorcha

The earliest construction of Structure 1, Phase 6, is reportedly similar to Corcha, the temple interred in Temple 10L-26 of Copan, in which Burial XXXVII-4 of the twelfth king was discovered [Fash 2001:111].

Again, these are the similarities: the relatively rough stonework, the fine and compact construction fill, and the walls overlain with clay. In particular, a ceramic effigy, the lid of a censer with a human figure with a turban headdress, possibly associated with Tomb 3, is impressively similar to those of Burial XXXVII-4.

Nevertheless, comparing Phase 6, Chorcha, and the burials made in them, there are also some differences. Phase 6 has a plan of 8 x 16 m. Chorcha is 11 x 30 m on the top surface, and its base shape is unknown but is likely much larger. Regarding their superstructures, Phase 6 has a touring wall, while Chorcha has 16 columns. Moreover, the contrast becomes even more significant when we compare the burials. They are entirely different in shape and scale. Tomb 3 is a direct interment within the structure. On the other hand, Burial XXXVII-4 is a masonry chamber covered with 11 massive capstones. Moreover, there is a stark disparity in the burial offerings' quality and quantity. Tomb 3 has two vessels, a shell necklace, and a ceramic effigy figure. Burial XXXVII-4 is much more sumptuous, associated with more than 60 vessels, 25 strombus shells, 25 jades, and many censers, including 11 with human effigies.

Even though building techniques were introduced from Copan to El Puente in the 7th century, Phase 6 and Chorcha are strikingly different.

COMPARING THE LA VENTA VALLEY AND FLORIDA VALLEY

In Copan, rapid population growth began around AD 600–650 in the reign of the eleventh king or his successor [Webster and Freter 1990:53]. Therefore, the Copan might have sought new colonies in the Florida Valley, the La Venta Valley, or both to decrease population pressure and secure trade routes to the east. Copan's Stela P of AD 623, erected by the eleventh king, has a glyph that appears to be Los Higos [Schele 1991:210]. It is speculated that Copan and the La Venta Valley could have already had a close relationship in the 7th century.

On the other hand, in the Florida Valley, we have repeatedly observed Copan-Maya elements at El Puente, such as the architectural techniques, effigy figure, and painted ceramics of Phase 6. All these similarities are between Phase 6 and Chorcha. Buried in the latter is the twelfth king, who reigned for more than 60 years, under whom the Copan Kingdom increased its power enormously. It is possible that during his reign, Copan expanded its influence to the Florida Valley and established an enclave.

Nevertheless, there are other aspects like the different architectural styles of Str. 31-6, a monolith (Stela II), and Altar II, similar to those of the non-Maya region, and indigenous ceramic types of the Florida Valley. If we only consider Structure 31 and its surroundings, we see the possibility that the local people of the Florida Valley began to build the Main Group of El Puente in the 7th century, adopting cultural elements of the growing powerful kingdom to reinforce their authority.

Site Plan

Even if Stela P of the eleventh king tells about Copan's expansion to the La Entrada region, it was in the La Venta Valley, and the situation was not necessarily the same in the Florida Valley. Although two valleys are often treated as one under the name of the La Entrada, they could have distinct meanings for the Copan Kingdom. As the first step to discuss the difference between them, we will compare the two valleys in two aspects.

First, we will focus on the non-Maya site plan found widely in the Lower Motagua Valley, and here we called it "Motagua Quadrangle." It consists of four long, narrow platforms sur-

rounding the court or plaza, which are often joined together to form closed corners, and its elaborate versions consited of two to four adjoining court complexes shareing a structure(s) between them [Schortman and Nakamura 1991: 319], differing from that of Mayan construction, in which independent structures surround a square space.

Figure 7 shows the distribution of this site plan in the La Entrada region. In the La Venta Valley, this site plan is scattered among medium-sized sites in the southern part, but this is not the case for the two largest sites, Los Higos and Roncador (Figure 8). In the northern part of the valley, there is no Motagua Quadrangle, including in small- and medium-scale sites.

On the other hand, in the Florida Valley, Motagua Quadrangle is found in almost all the largest sites. This pattern is evident in Techin and Nueva Suyapa in the northern part of the valley (Figure 9). Also, in El Puente (Figure 2), El Abra, and Las Pilas (Figure 10), we can see this arrangement of structures, but as Schortman and Nakamura mention [1991: 317], it is different in that there are independent pyramids, such as Structures 1 and 31 of El Puente, manifesting a compromise of "Lowland Maya" and "Lower Motagua" patterns.

Naturally, what the site shows today is the final stage of its occupation. At all these sites, ceramics of the Late Classic Period have been confirmed via excavation or surface survey. At the time of their abandonment, non-Maya cultural element, Motagua Quadrangle was distributed all over the Florida Valley and the southern part of the La Venta Valley. If Copan had strengthened its "influence" on these areas with remnants of this non-Maya site plan, perhaps this occurred late in the period and had a brief duration. As a result, this might not have been enough time to change or shift the site plan to that of Copan-Maya.

Copan-Painted Pottery

In the La Entrada region, four Copan-painted ceramics are present: Copador Polychrome (Figure 11), Gualpopa Polychrome, Caterpillar Polychrome, and Chilanga Red. According to the conventional chronology by Viel at Copan [Viel 1983], Copador is mainly 8th century pottery, while Gualpopa, Caterpillar, and Chilanga are 7th century or earlier. Besides, large quantities of Copador have been confirmed in the Southeast Maya region, and

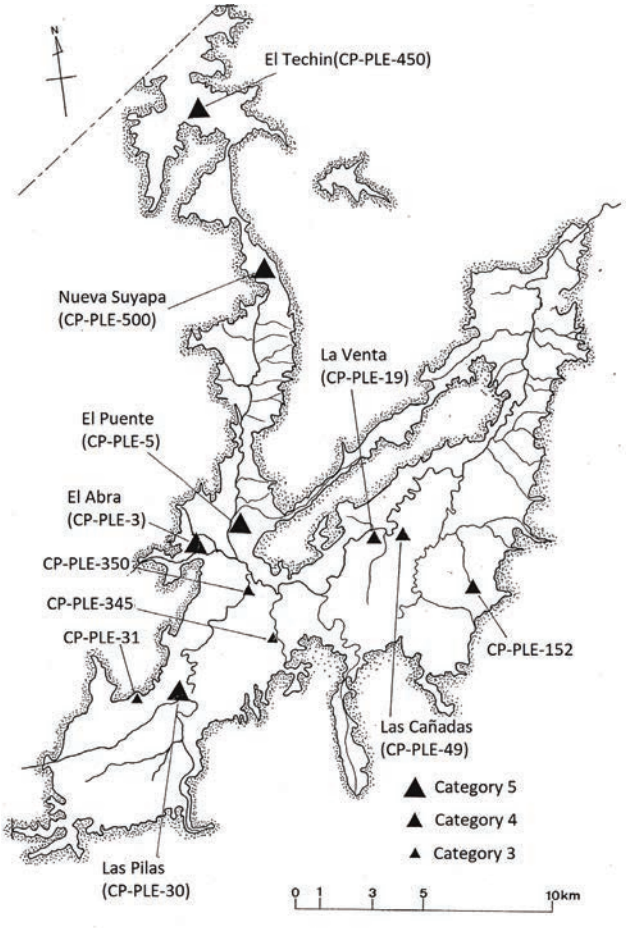

Fig.7 Distribution of Motagua Quadrangle in the La Entrada Region

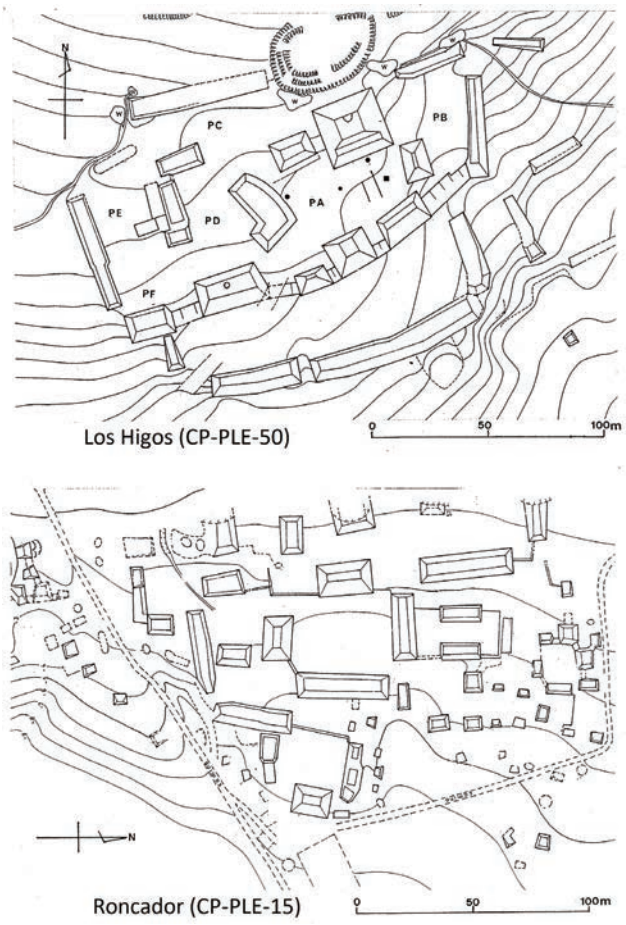

Fig.8 Sites in the La Venta Valley (from Nakamura et al. 1991, Appendix map)

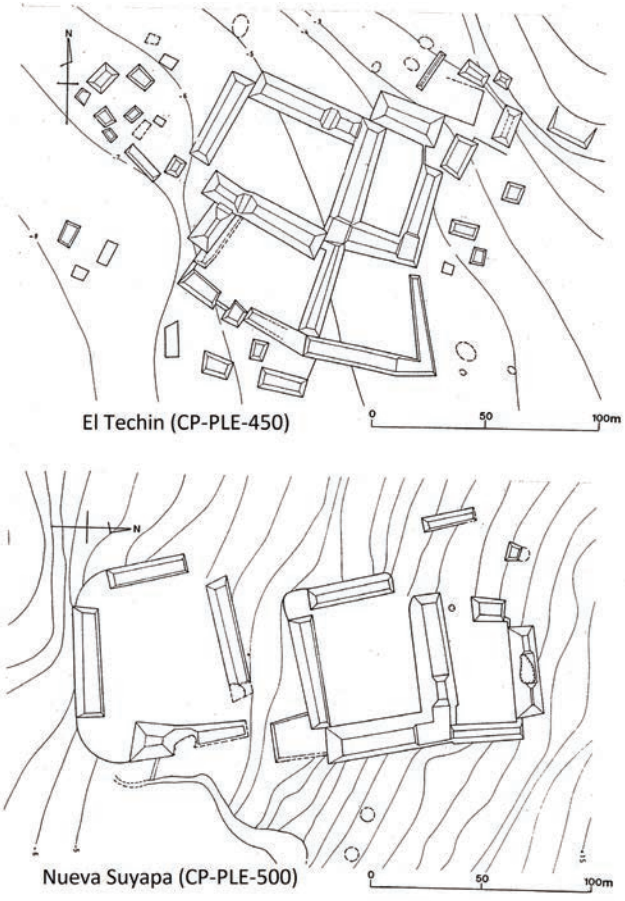

Figure 9 Sites in the Northern Florida Valley (from Nakamura et al. 1991, Appendix map)

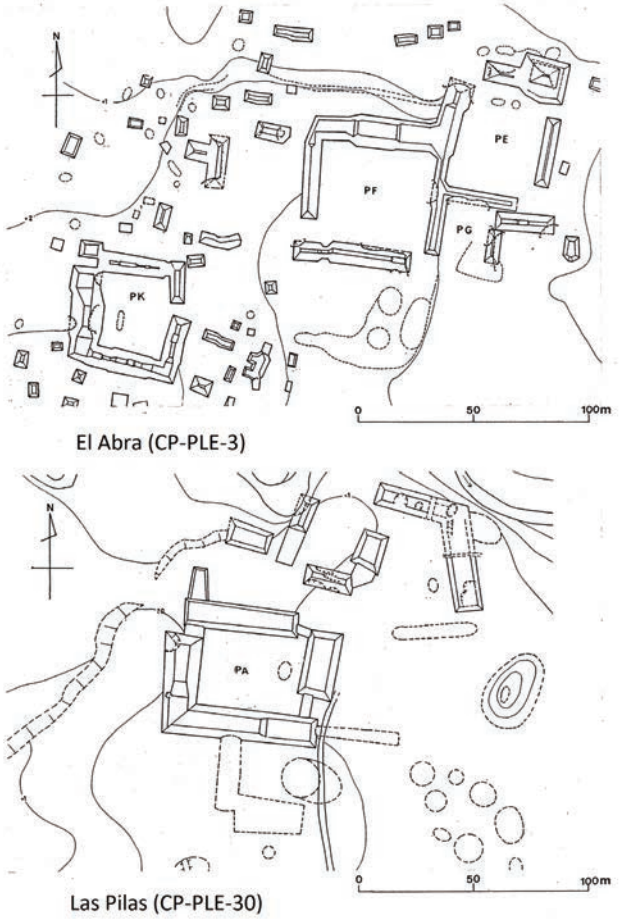

Figure 10 Sites in the Southern Florida Valley (from Nakamura et al. 1991, Appendix map)

the distribution is comparable to the sum of the other painted potteries.

The new ceramic chronology proposed the early 7th century as the possible beginning of Copador [Bill 1997:13–14, 325]. However, this fine pottery likely began being distributed widely in the Southeast Maya periphery, including the La Entrada region, sometime in the first half of the 8th century, as will be discussed.

As to Copador, there have been discussions about its origin and production place based on compositional analysis of the characteristic cream paste. At various sites in Southeast Mesoamerica, the clay of this fine ceramic shows similar chemical compositions. There was a hypothesis that this pottery was produced in the Copan Valley [Bishop et al. 1986], and later Neff et al. suggested it was made in Western El Salvador and exported to Copan in huge quantities [Neff et al. 1999]. Wherever the production site was, there has been no significant objection to the point until today that Copan controlled the distribution of Copador. Interestingly, even though this ceramic is widely diffused in Southeastern Mesoamerica, it is virtually nonexistent in Quirigua, another large classic center in Southeast Maya [Sharer 1978]. The only logical explanation for this phenomenon is that Copador "began to circulate outside the Copan Valley after AD 738" [Leventhal 1986: 140-142; Nakamura 1994:79], later than other painted ceramics such as Gualpopa, Chilanga, or Caterpillar. In that year, the ruler of Quirigua, which had previously been under the subordination of the Copan Kingdom, murdered the thirteenth Copan's king. Consequently, the two kingdoms entered into hostile relations. The assemblages of painted potteries from the early Coner period at Copan are mainly Gualpopa and Chilanga, with little Copador mixed in [Bill 1997:401]. It also confirms that the Copador is later than other painted ceramics.

Table 1 shows the results of the test pit excavations carried out during the first phase of the La Entrada archaeological project [Sato 1991b], from which only Copan-painted potteries are extracted. Strictly speaking, the excavations are inadequate to offer comparable data because the test pits' size and locations at each site were not standardized. However, a clear pattern can be discerned from this table. Copador, the later ceramic type, is more abundant in the Florida Valley, while other earlier painted

Table 1 Frecuency of Copan Painted Ceramics Types in the La Entrada Region (From Sato 1991b: Figures 58, 59, 61, 78)

Zone Site No.(Site Category)	Copador	Gualpopa (A)	Chilanga (B)	Caterpillar (C)	(A)+(B)+(C)
Northern Florida Valley					
14(5) Techin	17	14	0	0	14
500(5) Nueva Suyapa	18	0	0	0	0
540(3)	3	0	0	0	0
522(2)	4	0	0	0	0
Central-Southern Florida Valley					
3(5) El Abra	19	9	9	1	19
31(3)	7	1	1	0	2
Central-Southern La Venta Valley					
50(5) Los Higos	2	0	3	0	3
17(4) La Meca	5	0	3	0	3
53(4) La Jagua	47	0	2	0	2
283(3)	8	2	17	0	19
Northern La Venta Valley					
26(4) Diablo	20	12	21	1	34
150(4)	0	1	4	0	5
40(3)	8	1	0	0	1
203(3)	24	0	0	0	0
219(2)	1	0	0	0	0

Site Category: Larger the number, larger the site scale

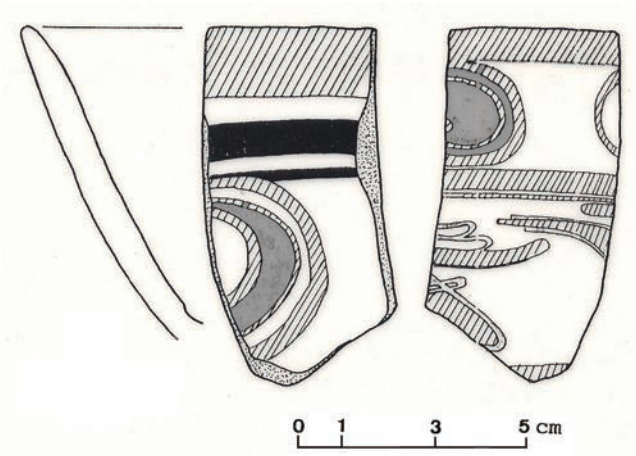

Figure 11 Copador Polychrome recovered from Layer 1, Structure 31, El Puente

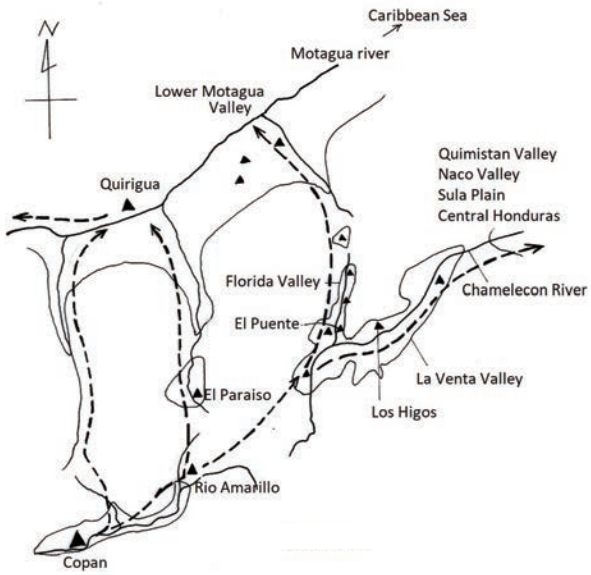

Figure 12 Trade Routes from Copan

ceramics are frequent in the La Venta Valley. At three of the four sites in the northern Florida Valley, only Copador was collected. Meanwhile, in the south-central part of La Venta Valley, an opposite trend is observed. There are several sites, such as Los Higos (CP-PLE-50), CP-PLE-283, CP-PLE-26, and CP-PLE -150, where the amount of Gualpopa, Chilanga, and Caterpillar exceeded that of Copador. Such sites do not exist in the Florida Valley.

The prevalence of Copador suggests that the Florida Valley strengthened its relationship with the Copan dynasty later than the La Venta Valley. It was probably after AD 738 and maybe only for a brief period before the dynastic collapse of Copan in

the 9th century.

Aoyama [1994] has already pointed out that the distribution range of the Ixtepeque obsidian is limited to the Florida Valley and the southern La Venta Valley, which overlaps with that of Copador, and that Copan's economic policies are behind this.

Background of the Copan Dynasty's Expansion Eastward

Regardless of when it was and how firmly it was, Copan expanded to the La Entrada region, and it will be an important question what the kingdom "sought" there.

For the Copan Kingdom, the La Venta Valley was a transit point of the long-distance trade route leading eastward down the Chamelecon River to the Naco Valley, to the Sula Plain, to Central Honduras, or even further to Lower Central America (Figure 12). If the emblem glyph inscribed on Copan's Stela P of AD 623 is that of Los Higos, it may reflect the arrival of Copan to the La Venta Valley in the early 7th century to secure its path to Western/Central Honduras.

On the other hand, in the 7th century, the Florida Valley had little importance for Copan with regards to extending the trade route. From Copan, going east through Rio Amarillo, one of its secondary centers, and passing a divide, it reaches the Florida Valley. From there, going up the Chinamito River, there is another watershed, and further on, it goes down to the Lower Motagua Valley. Downstream, the Motagua River leads to the Caribbean Sea, and upstream, the way proceeds to Upper and Middle Valley, containing jade sources. However, in the 7th century, at least by AD 652, Copan controlled Quirigua as its satellite center on the Motagua River [Martin and Grube 2008:201], and the route via Florida Valley to the Lower Motagua Valley was unimportant. To reach the Motagua River from Copan, one could go to Quirigua without taking the detour route that crossed watersheds twice.

Thus, if Copan established an enclave in the Florida Valley in the 7th century, it had to be for the land itself rather than to go somewhere via it. Canuto and Bell suppose that the El Paraiso Valley, some 30 km to the east, was a "maize baskets" for Copan residents in the 8th century, when the arable land of their homeland was blanketed with dense settlement [Canuto and Bell 2013:6]. However, it is questionable whether Copan extended its rule over remote lands and crops as early as the 7th century.

In the 8th century, the situation changed drastically. After AD 738, Copan had to find a route to the Motagua River, bypassing Quirigua, which had become a hostile force. The Florida Valley, which had been unimportant as a trade route, suddenly became essential to Copan after its defeat against Quirigua.

Perhaps the Copan dynasty bolstered its presence in the Florida Valley after AD 738, which lasted only shortly until its collapse in the early 9th century. If so, the distribution of the non-Maya site plan, the Motagua Quadrangle in the Florida Valley, and the southern La Venta Valley is understandable. Furthermore, Copador, which seems to have begun to circulate in large quantities after AD 738, may be evidence that the Copan dynasty strengthened ties with the Florida Valley, especially in the northern part at that time.

HUMAN MOBILITY BETWEEN COPAN AND ITS PERIPHERY

What, then, was the "influence," "expansion," or "entry" event to which we have been referring? Underlying the diffusion of archaeological culture is the movement of people, goods, and ideas. Of these, the movement of people has been the subject of much scientific research in recent years.

One of the themes discussed in the paper was whether migrants from Copan started the construction of the Main Group of El Puente or whether the local people imitated the architectural style of Copan. In this regard, a biological study has revealed the possibility of immigration.

Genetic research was realized with the teeth of two buried individuals excavated at El Puente and twelve from Copan [Shinoda 2003]. The primary purpose was to compare them to those of contemporary people living in that area and other places of Central America. However, this analysis of DNA presented another interesting fact as a byproduct. Two samples of El Puente and three of Copan demonstrated some possibility of matrilineal linkage among them. It is a small sample size study that presents one probability, but another stimulating biochemical research has been conducted in Copan.

Suzuki et al. [2020] measured strontium, oxygen, and carbon isotopes in human tooth enamel from 66 burials in 9L-22 and 9L-23 residential groups at Copan to detect these individuals' provenience. According to this analysis, the burials of local Copanecans and foreign-born peoples are distributed mixedly in the same residential complexes, exhibiting simultaneity in some cases. The data also show that in addition to the newcomers from central or northern Maya Lowlands, the non-Maya immigrants from Western/Central Honduras were sufficiently integrated into the Maya society, demonstrated by some burial of non-Maya immigrants with Maya-style funerary treatment. Furthermore, Suzuki et al. suppose that it probably became more pronounced during the twelfth king's reign and climaxed when the thirteenth king invited non-Maya elites to the royal capital to ensure his in-

fluence on Western/Central Honduras. However, it was probably brought to a halt by the king's unexpected death in 738.

Reconsidering the first question about the starting of massive construction at El Puente with this information, the possibility that Copan built an enclave in the Florida Valley during the reign of the twelfth king, who had a strong interest in the eastern region, seems to fit the trend of the time. In Rio Amarillo [McNeil et al. 2022], a center located in the middle of the route from Copan to Florida valley, Altar 1, with a possible date of AD 643, was erected by a junior member of the Copan royal family, and his father may have been the twelfth king. Then, under the Copan's control, structures of river cobbles and wattle-and-daub were replaced with cut stone façades of a pyramidal platform and an impressive stairway, appearing consistent with the phenomenon seen at El Puente, whether there is a strict parallel.

However, if non-Maya people enjoyed the material culture of Copan and were buried in the Maya-style, as is the case in Copan, it does not seem impossible that this happened in El Puente as well. Therefore, the Tomb 3 interment does not necessarily mean that the person is from Copan, despite being buried inside a Copan-style structure with the Copan-type grave goods. Furthermore, since Copan was a multi-ethnic city, diverse interpretations can be made of the possible maternal kinship between the buried individuals of Copan and El Puente. Of course, it is not necessary to think that people moved from Copan to El Puente. The reverse is also possible.

The migration from Western/Central Honduras to Copan is being discussed. However, if we look at the long-term scale from the Preclassic to the Postclassic, even in the Copan Valley, home of the dynasty, the Maya themselves can be seen as outsiders. It has been argued that the reason for the similarities of archaeological cultures between the Late Preclassic and Early Postclassic Periods at Copan is that the people who carried them were of the same ethnicity [Manahan and Cantuto 2009]. Copan, the eastern capital of the Classic Maya, was inhabited and reigned by the Maya only during the Classic Period. The Maya of Copan, who built their dynasty on land originally inhabited by a non-Maya group, were intrusive in nature. We often forget this when blinded by the splendor and prosperity of the Classic Period.

CONCLUSION

From the author's perspective, based on the excavation of Structure 31, it seems that the construction of El Puente began and developed as a result of the growth of local power. On the other hand, Structure 1, probably constructed around the same time, shows substantial similarity to Copan-Maya architecture and artifacts. However, the author is skeptical that this means the presence of the Copan royal family and that Copanecan migrants built El Puente and controlled the Florida Valley. Indeed, the trajectory of development of El Puente and El Amarillo, which became an outpost of Copan in the 7th century, is similar, but there is no clear evidence that tells Copan's direct control at El Puente such as the inscription of Altar 1 of El Amarillo. Moreover, El Amarillo is located only 20 km from Copan and is a transit point that must be passed through when heading east. El Puente's geographical importance was minor before AD 738, as stated above.

However, the possibility of a migration of human populations from the Copan Valley to the Florida Basin is not entirely ruled out. Canuto and Bell [2009], who compared two contemporaneous centers, El Paraiso and El Cafetal, in the El Paraiso Valley, explain that Copan adopted a strategy of founding its own administrative center of similar size close to the local autochthonous center. This "duplication strategy" of building paired centers at critical nodes on long-distance trading routes was used by Copan to accomplish their control by maintaining and emphasizing the cultural differences rather than completely assimilating the inhabitants of the surrounding regions into the kingdom.

Canuto and Bell identify El Puente as the local center and El Abra, 1.4 km from the former across the Chinamito River, as the center inaugurated by Copan in the Florida Valley. The author hesitates to agree with this hypothesis, but the contrast between Structures 1 and 31 at El Puente suggests that this situation may have existed within a single site. It is possible that the presence of Copan-painted ceramics in Structure 1 and the abundance of non-Maya local potteries in Structure 31 in their early stage might be caused by the chronological difference, with Str. 31-6 being slightly earlier than Phase 6, the cultural affiliations of the people who built and occupied the two structures, the activities that took place, and the economic disparities all combined.

If Copan made its outpost at El Puente in the 7th century, as discussed above, its purpose would be the land and crops, though Florida Valley seems too far to be a food supply area. But in any case, the situation changed after AD 738. While the thirteenth king's death weakened the ties with Western/Central Honduras, and the relative importance of the La Venta Valley seems to have declined, as seen in the relative scarcity of Copador Polychrome, the Florida Valley became an important trade route for Copan. The people of the Florida Valley increased close interaction with Copan, and the Copan-Maya style became more potent in the material culture. In the final phase of El Puente, in Structure 31

as well as in Structure 1, which has some stone sculptures, the stucco floor was laid on and around the platform, which had not been seen before. Also, stoneworking techniques were much more advanced than in the earlier phases. Copan-painted pottery, including Copadors, increased. And not only elite culture but even domestic ceramics such as Tango Brown, which bears similarities to Copan, were abundant.

However, it did not last long. At the beginning of the 9th century, the collapse of the Copan dynasty brought this prosperity to an end as it engulfed the surrounding region.

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Source Analysis of Obsidian Artifacts from the Southeastern Maya Region: Focusing Particularly on the La Entrada Region and the Outer Periphery

Masahiro Ogawa

Introduction

Common cultural elements in the Maya civilization and in other Mesoamerican civilizations include writing systems and calendars, pyramidal temples, advanced astronomy, corn-based diet, and human offerings [e.g., Kirchoff 1992]. These common cultural elements were instated and established as people, goods, and knowledge spread about through trade networks. As such, interregional exchanges played a vital role in the political and economic development of the Maya civilization.

Obsidian, the subject of this paper, was also supplied to the Maya through such trade networks. Although obsidian is produced by volcanic activity and its sources are limited, obsidian stone tools have been found in excavations throughout the Maya region. This fact suggests that obsidian must have been acquired through trade. For the Maya, a civilization that did not use metals to manufacture tools and relied on stone as their primary working material, obsidian —besides being limited in its sources— was a resource as valuable as iron, oil, or natural gas in modern times since it could be used to manufacture sharp blades. The obsidian they acquired was used for many purposes and played a significant role in various situations --weapons included, but also everyday tools.

This paper focuses on this essential stone material used by the Maya. It discusses obsidian artifacts excavated in the southeastern Maya region —including the La Entrada region and the Azacualpa site— and presents the results of the x-ray fluorescence analyses used to determine the source of the stone and the associated interregional exchanges implied.

Overview of the Southeastern Maya Region and the Outer Periphery

The area where the Maya civilization flourished is what is now southern Mexico, Guatemala, Belize, western Honduras, and western El Salvador (Fig.1). The area extending from eastern Guatemala to west Honduras and western El Salvador is called the southeastern Maya region. It is located at the southeast

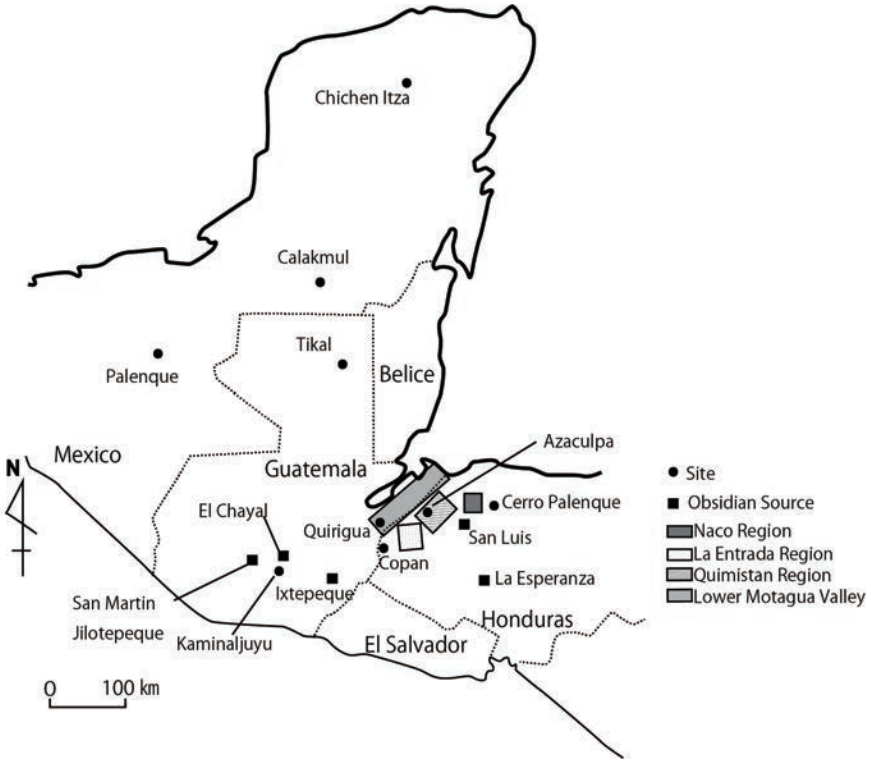

Fig.1: Southeastern Maya region and primary obsidian sources

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border of the area where the Maya civilization thrived. Compared to sites in other areas, the southeastern Maya region is in a geographical environment that is relatively close to obsidian, jade, and other resources. In addition, as mentioned above, it is located at the southeastern border of the Maya civilization area and as such corresponds to the frontier with non-Maya societies. It is, therefore, an area where trade and cultural contact between Maya and other people must have been conducted. Within the Maya civilization, this region must have definitely functioned as a node of their trade network.

Located in western Honduras, Copan was the region's most powerful and prosperous city. From 426/427 AD, when the Copan dynasty was founded, to around 820 AD, when the dynasty is believed to have collapsed, Copan exerted its political, economic, and cultural influence on the La Entrada region—its immediately surrounding area (Fig.2) — as well as on eastern Guatemala. Evidence of the trade network established across the frontiers in this area was found in the La Entrada region, located about 50 km northeast of Copan. Analyses of artifacts excavated during the La Entrada Archaeological Project revealed a mixture of Maya and non-Maya material culture [Nakamura et al. 1991a; 1991b].

Further northeast of the La Entrada region is the Quimistan region, the Naco region, and the lower Motagua Valley. For this paper's purpose, these regions in northwestern Honduras will be defined as the outer periphery. While this outer periphery corresponds to a non-Maya region, however, it is not absent Lowland Maya cultural elements. Ulua-Yojoa Polychrome, for example, a type of pottery produced primarily in the area east and adjacent to the southeastern Maya region, has been found to imitate Maya script in its painted motifs [Hirth 1988: 314]. It is currently believed that the Maya and non-Maya peoples influenced each other, creating a unique society and culture along this borderline of different civilizations.

Primary Sources of Obsidian in the Southeastern Maya and Methods for Source Analysis

A great amount of information on obsidian sources, obsidian outcrops, and the various uses of obsidian has been obtained through the synthesis of previous studies [e.g., Aoyama et al. 1999; Braswell et al. 2000]. Since obsidian is produced by volcanic activity —a condition that otherwise limits its sources—

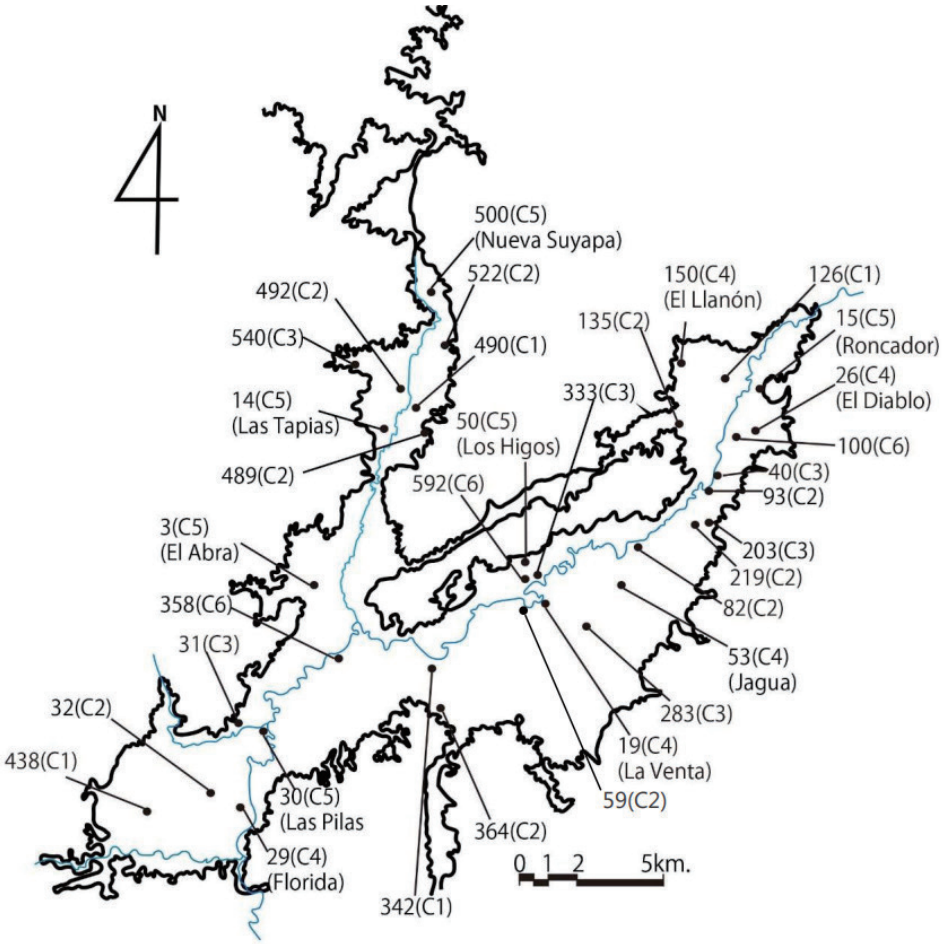

Fig.2: the La Entrada region (Fukui 2015: 115 Figure 17)

several obsidian sources can be precisely located in the southeastern Maya region. The primary obsidian sources used in the past include San Martín Jilotepeque, El Chayal, and Ixtepeque (in Guatemala); and La Esperanza and San Luis (in Honduras) (Fig.1). Obsidian, however, was also acquired from far-flung places. Obsidian from the central Mexican Highlands was also used at Copan during the Classic Period[1] and the Early Postclassic Period [e.g., Aoyama 1999:95, 131, 187]. In order to obtain this obsidian, various exchange networks, including intraregional, interregional, and long-distance networks must have had to be established.

The chemical composition of obsidian sourced from different places varies according to the chemical composition of the magma in the terrain and to physical conditions such as temperature and pressure at the time of its formation. Each source area imprints unique characteristics to the obsidian it produces. By identifying such aspects in stone samples quarried from the source areas and comparing them with the features of obsidian artifacts found in archaeological excavations, it is possible to give an estimate location of its provenance. This could be a vital clue for inferring the movement of people and the interregional exchanges brought about by stone trade in the past.

Obsidian source analyses in the Maya region have been carried out before, and they can be categorized according to two main methods: the first, a subjective visual analysis; the second, a chemical analysis.

In a visual analysis, the source is estimated by observing and comparing the characteristics of samples from each area in terms of color, transparency, brightness, inclusions, etc. [e.g., Aoyama 1999; Braswell et al. 2000]. Visual analysis is a rapid and inexpensive method, but it retains the disadvantage of relying heavily on the analyst's subjective vision, experience, and skill.

In contrast, in the other category, chemical analyses boast scientific objectivity. The most common methods among this category include neutron activation [e.g., Vogt et al. 1982] and x-ray fluorescence analyses [Glascock et al. 1998]. These analyses are not as rapid and inexpensive as a visual analysis, but they have the highly regarded advantage of being objective and disprovable. Although in archaeological literature visual analysis has been the most common method, chemical analytical techniques —including x-ray fluorescence analysis— have become increasingly more common in recent years. In particular, there has been a marked tendency towards using portable x-ray fluorescence analyzers that can be taken to archaeological sites for on-site analysis.

A Study of Obsidian Source Analysis and Interregional Exchange in the Southeast Maya Region

Many studies have been conducted in the southeastern Maya region on obsidian sourcing and interregional exchange based on either of the methods just explained [e.g., Aoyama 1991; Aoyama 1999; Fukui 2015; Harbottle et al. 1994]. For example, in Aoyama's study, the source was estimated by visual analysis. In Copan, the largest city in the southeastern Maya region, 98.5% of the obsidian was reported as excavated from Ixtepeque [Aoyama 1999:24]. Neutron activation analysis has also been conducted on obsidian excavated from Las Sepulturas site in Copan, the site of an aristocratic residential area. The results indicated that 95% was Ixtepeque obsidian, and the remaining 5% was from El Chayal [Harbottle et al. 1994:446]. From these previous studies, the source analysis results based on visual examination and chemical analyses clearly indicate that Ixtepeque was the majoritarian source of obsidian for Copan. In particular, the currently held theory is that the ruling class of Copan during the Late Classic period had a privileged access to Ixtepeque obsidian and redistributed it from the urban center out to the periphery [Aoyama 1999:134-135].

It has also been pointed out that during the Late Classic period in the La Entrada region the percentage of obsidian from Ixtepeque was higher in the more significant sites, suggesting that the Kingdom of Copan controlled the Ixtepeque obsidian and supplied it to the surrounding La Entrada region [Aoyama et al. 1999:240]. However, it has been reported that although the proportion of Ixtepeque obsidian is highest in the south of the La Entrada region, the balance shifts in its northernmost areas where Ixtepeque obsidian sharply decreases as San Luis obsidian increases [Aoyama 1999:145]. This has been interpreted as an indicator of the boundary of the Ixtepeque obsidian distribution zone controlled by the Kingdom of Copan in the Late Classic period, the boundary lying between Los Higos and Roncador political areas of La Venta Valley, or both [Aoyama et al. 1999:247].

On the other hand, Fukui conducted a source analysis using x-ray fluorescence of obsidian artifacts excavated from the La Entrada region [Fukui 2015]. Fukui reported that while obsidian from Ixtepeque could account for a high proportion of obsidian in the northernmost part of the La Entrada region, such as in the Diablo site, San Luis obsidian might have also been majoritarian at places that were thought to be strongly related to Copan, such as the Los Higos site. Fukui also reports that obsidian from San Luis was sometimes found at sites that were thought to be strongly associated with Copan such as the Los Higos site [Fukui 2015:80-82]. This finding points to a more complex obsidian

trading network than what was previously assumed.

The distance from Copan to Ixtepeque, its primary obsidian source, is about 80 kilometers in a straight line. The distance from Copan to San Luis and La Esperanza is almost 80 and 120 kilometers, respectively. This is the extent of the control and distribution zone of Ixtepeque obsidian by Copan during the Late Classic Period. It is noteworthy that despite this slight difference in length, obsidian from Ixtepeque was widely used.

Regarding connections across the Maya frontier, from the stand of the results of the obsidian studies, the relationship with central Honduras has been interpreted as rather weak[2] [Aoyama 1993:115]. However, studies of migration dynamics based on stable isotope analysis [Suzuki et al. 2020] have, in opposition, reiterated the connection to central Honduras and to other areas. It is, therefore, necessary to reconsider the reality of interregional exchange in the southeastern Maya region and examine once again the possibility that more obsidian was acquired from sources other than Ixtepeque, especially from San Luis and La Esperanza, which are located in a non-Maya area. As part of this research's process, it is most important to conduct a study of previously unanalyzed obsidian artifacts based on a chemical analysis and cross-check their sources. This paper will focus on obsidian excavated from the Azacualpa site which is located in the La Entrada region, outside of the Ixtepeque obsidian distribution zone of the Copan Kingdom in the Late Classic Period.

Overview of the La Entrada Region and Analytical Artifacts

The La Entrada region is located in northwestern Honduras. It consists mainly of the La Venta and the Florida Valleys and occupies a total area of about 150 km² [Nakamura et al. 1991a:5]. It lies at about 50 km from Copan as measured in a straight line. Although brief sporadic investigations were conducted in this area and several archaeological sites were known, no organized archaeological research was performed until the 1980s. In 1984 the Japan Overseas Cooperation Volunteers (JOCV) Secretariat of the Japan International Cooperation Agency and the Honduran Institute of Anthropology and History (IHAH) jointly conducted a project to study the archaeological sites of Honduras. This was the first archaeological project in the region, and it continued until 1994 with a second term with Seiichi Nakamura as project director [See Nakamura's paper].

The La Entrada Archaeological Project has revealed traces of diachronic habitation and intercity interaction throughout its study area [Nakamura et al. 1991a; Nakamura et al. 1991b]. This area has been inhabited since the Preclassic period and was most developed during the Late Classic period [Aoyama et al. 1999:239]. Many archaeological sites —including the Los Higos site discussed below— have characteristics of the Maya lowlands (stone monuments carved with Maya script, urban structures, pottery, and stone materials for construction) and a notable deep connection with Copan [e.g., Nakamura et al. 1991a]. As part of the research and studies carried out during this archaeological project, 714 sites were identified and registered [Nakamura et al. 1991a:13]; 37 have been partially excavated [Nakamura et al. 1991a:20-22] , including the outer periphery of the La Entrada region. Aoyama has determined by visual analysis the source of obsidian artifacts unearthed during this project [Aoyama 1991], and, in this paper, his results will be cross-checked using x-ray fluorescence. In particular, the scope of this paper is limited to a sample of 358 obsidian artifacts, most of them excavated from Category 5 sites[3] in the La Entrada region, but some from Category 4 sites were also included.

Overview of Azacualpa Site and Analytical Artifacts

The Quimistan Valley is located in the northeastern part of the La Venta Valley in the La Entrada region. The Azacualpa site is located in the western part of this valley. The Quimistan Valley is adjacent to the La Entrada region and to the Naco Valley. The lower Motagua Valley is thus held as a critical area for examining the relationship between regional interactions with such adjacent regions and between the Maya and non-Maya areas [Abe 1992:1]. As part of the second phase of the La Entrada Archaeological Project, research began at the Azacualpa site in 1991 and has continued since.

The Azacualpa site was categorized as a large site; 107 mounds were identified in it. It is thought to have functioned as a regional center serving bygone times [Nakamura 1991c:130-131]. The center of this site has a non-Maya cultural pattern due to the double enclosure arrangement of the plaza and the settlement pattern where buildings are placed in the plaza's center [Abe 1992:2]. Five exploratory pits were excavated as part of the survey conducted during the La Entrada Archaeological Project [Abe 1992:3-15]. Most of the pottery excavated corresponded to the Late Classic period. The surface collection also revealed pottery corresponding to the Preclassic period, evidence that occupation at this site began between the Preclassic and the Late Classic periods. In addition to pottery, obsidian artifacts —the focus of this paper— were also excavated, 115 of which were subjected to a preliminary analysis by Aoyama to determine their source through a visual analysis [Aoyama 1992]. In this paper, 178 obsidian artifacts[4] are treated as the object of study.

Analysis Method

As mentioned above, it is necessary to perform a source analysis by means of a chemical analysis for artifacts for which a source analysis has already been made by visual examination in order to cross-check the results. It is also required to include unanalyzed materials and present these new results. I will endeavor in the following to establish the source of such obsidian artifacts from the La Entrada and Azacualpa areas by means of x-ray fluorescence analysis to the unanalyzed materials. In addition, A discussion of the situation of the acquisition of obsidian materials and the associated interregional exchanges will complement the results of the x-ray analyses.

Fluorescent x-ray analysis is a technique that uses fluorescent x-rays produced by the transfer of electrons between atomic nuclei when a sample is irradiated with x-rays. Since each element has its own characteristic wavelength in the fluorescent x-rays spectrum, a detailed list of elements contained in the sample and their relative amounts can be determined by measuring them. Unlike neutron activation analysis, also a method of chemical analysis, this is a non-destructive method suitable for the handling of archaeological artifacts. Fluorescent x-ray analyzers also have the advantage of being reasonably easy to operate.

A ZSX Primus II wavelength-dispersive x-ray fluorescence analyzer manufactured by Rigaku and property of the Mineralogy and Crystallography Laboratory of Kanazawa University was used for the analysis. The measurement conditions were as follows: voltage: 50 kV, current: 50 mA, irradiation diameter: 10 mm, measurement time: 480 s, atmosphere: vacuum. The specimens were placed in a sample holder and subjected under such parameters to an x-ray fluorescence analysis. Obsidian specimens less than 3 cm in diameter were placed in a polyethylene sample container covered with a polypropylene film to fix the surface and then placed in a sample holder for analysis. A quantitative analysis was performed to calculate the proportions of the nine major constituent elements of obsidian —aluminum (Al), magnesium (Mg), silicon (Si), chlorine (Cl), potassium (K), calcium (Ca), titanium (Ti), manganese (Mn), and iron (Fe)— along with other elements considered helpful in source analysis —rubidium (Rb), strontium (Sr), yttrium (Y), and zirconium (Zr)— for a total of 13 elements analyzed.

Before working with the obsidian artifacts excavated from the site, samples from each obsidian source [Fukui 2015] that Fukui quarried during his fieldwork in the area were subjected to x-ray fluorescence analysis. When the analysis stage was finished, the obtained values were exported as Excel data. Scatter plots[5] were then created using the values for rubidium and strontium, elements suitable for a source analysis that will be able to distinguish obsidian from Ixtepeque, San Martin Jilotepeque, and San Luis (Fig. 3). It is, however, difficult to discriminate La Esperanza obsidian from El Chayal because they show almost identical analytical values. For these two types of obsidians, another step in their discrimination was taken: a scatter plot with the analysis values of iron and rubidium was also generated (Fig. 4). Once the source sample analysis is complete, the results of a preliminary source analysis of the obsidian artifacts excavated from the archaeological sites can be visualized by plotting their values in these scatter plots.

Source Analysis Results - the La Entrada Region and the Outer Periphery

The results of the source analyses of the obsidian artifacts from the La Entrada region and the Azacualpa site based on the obtained analytical values and the discriminant diagrams are shown in Table 1. As reported in previous studies, the overall trend is that obsidian from Ixtepeque is found in large quantities. However, at the Azacualpa and Los Higos sites, the proportion of obsidian from San Luis is also significant.

Focusing on the balance of Ixtepeque obsidian, two patterns

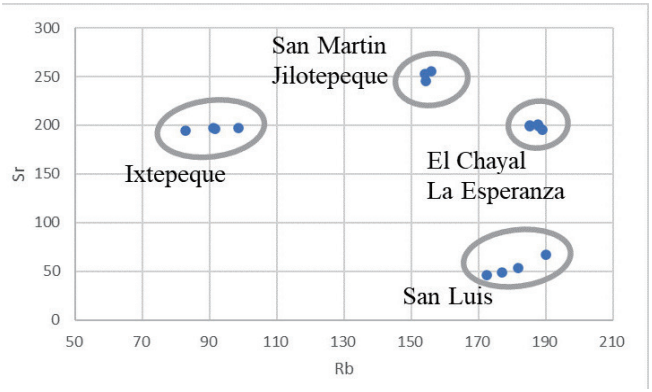

Fig.3: Diagram of Rb-Sr discrimination for obsidian samples (unit: ppm)

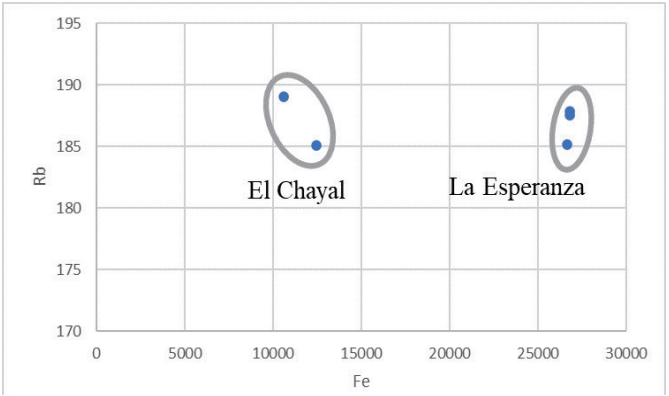

Fig.4: Diagram of Fe-Rb discrimination for obsidian samples (only La Esperanza and El Chayal / unit: ppm)

Table 1: Results of source analysis (the La Entrada region and Azacualpa)

Region	Outer Periphery	La Venta Valley (C5)		La Venta Valley (C4 and below)			Florida Valley (C5)				Florida Valley (C4 and below)	
Site	Azacualpa	Los Higos	Roncador	Diablo	Chalmeca	PLE-203	Nueva Suyapa	Las Tapias	Las Pilas	El Abra	Florida	PLE-32
Ixtepeque	66	46	1	72	21	46	6	35	8	28	20	12
San Luis	99	45	1	0	2	1	0	0	0	0	1	0
San Martin Jilotepeque	0	0	0	0	1	1	0	0	0	1	0	0
El Chayal	9	2	0	1	0	0	0	0	0	1	2	0
La Esperanza	4	0	0	2	0	0	1	0	0	0	1	0
Total	178	93	2	75	24	48	7	35	8	30	24	12
Percentage of Ixtepeque Source (%)	37.1	49.5	50	96	87.5	95.8	85.7	100	100	93.3	83.3	100

can be seen in the obsidian artifacts from the La Entrada region and from the outer periphery. The first pattern shows a trend towards a category that lacking a better name will be tagged "mostly Ixtepeque obsidian". This is seen in much of the La Entrada region, including Category 5 sites in the Florida Valley, Category 4 or smaller sites in the Florida Valley, and Category 4 or smaller sites in the La Venta Valley. The percentage of Ixtepeque obsidian present at these sites is over 80%. The second pattern shows a tendency towards a "high proportion of San Luis obsidian in addition to Ixtepeque obsidian". This applies to Category 5 sites in the outer periphery and in the La Venta Valley. The percentage of Ixtepeque obsidian present at these sites is less than 50%. Thus, there is a marked difference in the source of the obsidian acquired in the La Entrada area and in the outer periphery.

The reason for these different patterns is again related to the distance from the source. In the Florida Valley, which is relatively close to Copan and Ixtepeque, Ixtepeque obsidian is abundant. The La Venta Valley is relatively close to San Luis and consequently has a higher proportion of San Luis obsidian. However, the fact that a certain number of Ixtepeque obsidian was obtained from a source relatively far away in the La Venta Valley also points to the value and the importance of the Ixtepeque obsidian. Category 5 sites such as Los Higos and Roncador have a high percentage of San Luis obsidian. In contrast, Category 4 and smaller sites that were probably under their influence have a high percentage of Ixtepeque obsidian. While previous studies have shown that more significant sites in the La Entrada region have a higher percentage of Ixtepeque obsidian [Aoyama et al. 1999:240], this is not necessarily true in the La Venta Valley. This may indicate a complex obsidian trading network in this region between Maya and non-Maya peoples.

Source Analysis Results - Los Higos and Azacualpa

Up to this point, this paper has focused on the La Entrada area and on the outer periphery to discuss the obsidian source analysis results from a macro perspective. It shall now shift the attention to the Los Higos and Azacualpa sites where obsidian has been excavated and shall take into account previously published studies. Los Higos is located in the La Venta Valley in the La Entrada region. It served as the valley's economic and political center [Nakamura 1991a:59]. Inscriptions and altar complexes with Maya scripts and pyramidal temple architecture have been identified at this site that present lowland Maya characteristics similar to those of Copan [Schortman and Nakamura 1991:317]. Based on these archaeological findings, it is possible to sustain that Los Higos was closely related to Copan.

Firstly, a comparison with previous studies regarding the obsidian artifacts from Los Higos could also serve as an overview of the results. Aoyama reported that out of the 97 obsidian artifacts excavated from strata corresponding to the Late Classic period, Ixtepeque accounted for 93% (90 pieces), San Luis for 6% (6 pieces), and El Chayal for 1% (1 piece) [Aoyama 1991:160]. On the other hand, the results of the analysis carried out for this paper indicate that out of the 64 Obsidian artifacts excavated from strata corresponding to the Late Classic Period, 59% (38

pieces) were from Ixtepeque, 38% (24 pieces) from San Luis, and 3% (2 pieces) from El Chayal. It is noteworthy that obsidian from Ixtepeque resulted in a smaller portion than what was reported in previous studies. Obsidian from San Luis might have been acquired more present at the Los Higos site during the Late Classic period than what was previously thought. This trend may also indicate the need to reconsider Aoyama's proposed "boundaries of the Ixtepeque obsidian distribution zone by the Kingdom of Copan in the Late Classic Period" and "the boundaries of the political domains of Los Higos and Roncador in the La Venta Valley" [Aoyama et al. 1999:247].

Next, the Azacualpa Obsidian artifact percentages show that San Luis accounts for 56% (99 pieces), followed by Ixtepeque with 37% (66 pieces). This result is similar to Aoyama's source analysis in previous studies [Aoyama 1992:6-7]. Aoyama estimated that 56.5% (65 pieces) of the 115 pieces were of unknown origin [Aoyama 1992:6]. These pieces were then awaiting the results of the neutron activation analysis at the time and correspond to San Luis. On the other hand, 43.5% (50 pieces) of the 115 samples were estimated to correspond to the Ixtepeque locality [Aoyama 1992:7]. Thus, it can be pointed out that Azaqualpa obtained a large amount of obsidian from San Luis, its closest source. The analysis of the obsidian material from the Azacualpa site also points to the possibility that obsidian was acquired from other previously mentioned sources. The analysis results indicate the presence of obsidian brought from El Chayal and La Esperanza, although in a small quantity (7% of the total). In other words, the people of Azacualpa acquired obsidian not only from San Luis and Ixtepeque, but from other sources as well. This implies that their acquisition patterns were more diverse than what was previously assumed.

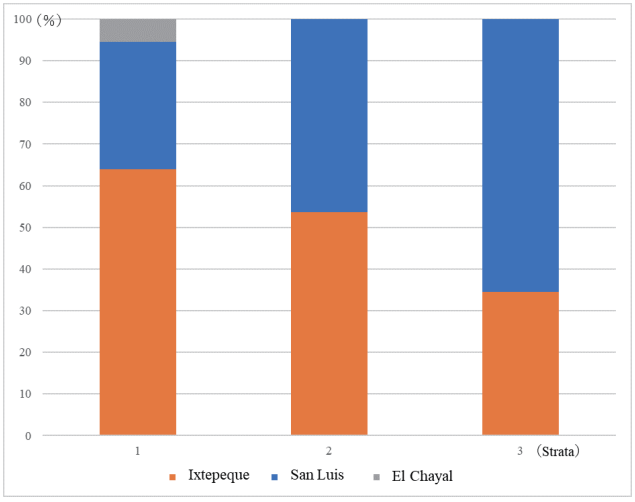

Fig.5: Proportion change of obsidian source by strata (Los Higos)

Diachronic Changes in the Obsidian Sources

Whether such trends in obsidian proportions have changed over time or not needs to be determined. Following the previous section, the focus will now shift to the Los Higos and Azacualpa sites. Since there are no radiocarbon dating results for excavation materials from the same strata, it is quite challenging to follow diachronic changes in a sufficiently precise manner. However, in the following, graphs and tables that show the changes in the distribution of obsidian according to its source for each stratum from which obsidian was excavated will be presented and this should confirm if changes in the obsidian source can be seen from a diachronic perspective.

First, at the Los Higos site, the proportion of Ixtepeque obsidian gradually increased during the Late Classic period (strata 1 and 2) while the ratio of San Luis obsidian was higher before the Late Classic period (strata 3) (Fig. 5, Table 2). This suggests that the Ixtepeque obsidian may have become the predominant type of obsidian as time went by.

As for the Azacualpa site, San Luis obsidian was found to be dominant in strata older than strata 1 and 2, which correspond to the period of the last occupation (Late Classic Period) (Fig. 6, Table 3). Although obsidian from San Luis can be found in the last inhabited period, the number of obsidian samples is drastically reduced to 3 out of 33. In contrast, the proportion of Ixtepeque obsidian has augmented since that last occupation period. Although it can also be found in the previous occupation, it increases in the final occupation period and replaces San Luis obsidian. This is similar to the case of the Los Higos site mentioned earlier and, as pointed out in a previous study [Aoyama 1992], it indicates an evident diachronic change in the obsidian source.

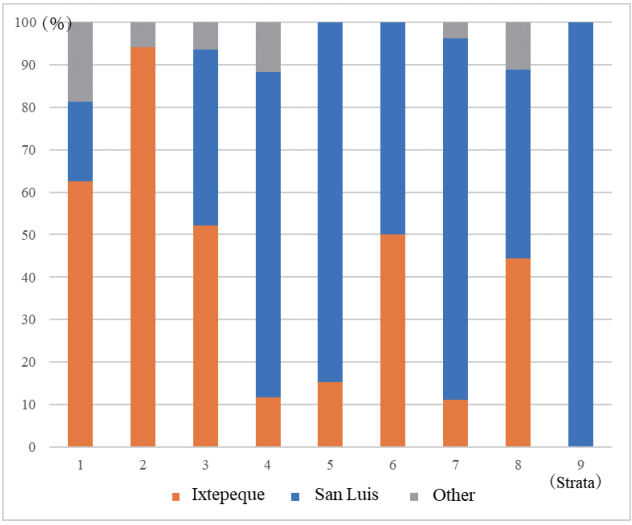

Fig.6: Proportion change of obsidian source by strata (Azacualpa)

Table 2: Obsidian numbers by strata and results of source analysis (Los Higos)

Strata	Ixtepeque	San Luis	El Chayal	Total
1	23	11	2	36
2	15	13	0	28
3	10	19	0	29
Total	48	43	2	93

Table 3: Obsidian numbers by strata and results of source analysis (Azacualpa)

Strata	San Martin Jilotepeque	El Chayal	Ixtepeque	La Esperanza	San Luis	Total
1	0	0	10	3	3	16
2	0	1	16	0	0	17
3	0	3	24	0	19	46
4	0	3	4	1	26	34
5	0	0	4	0	22	26
6	0	0	1	0	1	2
7	0	1	3	0	23	27
8	0	1	4	0	4	9
9	0	0	0	0	1	1
Total	0	9	66	4	99	178

As presented in the previous section, while Category 5 sites in the outer periphery and the La Venta Valley tend to have more San Luis obsidian, the acquisition of Ixtepeque obsidian increased with time. This indicates that obsidian acquisition strategies and the nature of regional exchange may have correspondingly changed in the La Venta Valley and in the outer periphery. The period that saw the weakening of the Copan dynasty is the most significant in the examination of the factors that changed the strategy for acquiring obsidian and the nature of interregional exchange during the Late Classic Period. Copan, which had been one of the largest cities in the southeastern Maya region, began to show signs of a decline in its prosperity after the 738 AD incident in which Quirigua overthrew Copan. The interpretation of the increase in the proportion of Ixtepeque obsidian at Los Higos and Azacualpa differs greatly depending on whether it happened before or after this period.

However, as noted above, a radiocarbon dating analysis is needed in order to put forth a single firm interpretation. Since such dating analysis is yet to be done, two possibilities are presented below. The first: the acquisition of Ixtepeque obsidian may have increased as Copan expanded its sphere of influence and Los Higos and Azacualpa were finally incorporated into the Ixtepeque obsidian distribution zone. The second: the decline of the Copan dynasty and the consequent collapse of the distribution system (change of trade routes) enabled a more stable acquisition of Ixtepeque obsidian. Although it is impossible to reach a conclusion based only on the relationship with Copan at this present moment, it is still possible to see that Azacualpa, and Los Higos clearly show different characteristics.

Azacualpa, as noted above, exhibits a non-Maya cultural pattern [Nakamura 1992:136-137] and lacks the lowland Maya cultural pattern [Schortman and Nakamura 1991:317] found in the southern the La Entrada region; its relationship with Copan is still vague. As shown in Figure 5, Azacualpa was already acquiring Ixtepeque obsidian before the Late Classic period. Considering these cultural patterns, the decline of the Copan dynasty likely facilitated the turning point for the source shift when Ixtepeque obsidian became more readily available.

In contrast, the Los Higos site does present lowland Maya characteristics. Furthermore, among the figures carved on Stela

1 at the Los Higos site, one is dressed with a turban [Schele 1991:209-211]. This is the same attire seen in depictions of kings in stone carvings and in incense burner lids belonging to the Classic period and found at Copan. This suggests that Copan exerted a strong influence on the city. Thus, the acquisition of Ixtepeque obsidian increased in the La Entrada region —Los Higos included— as Copan expanded its sphere of influence and Los Higos was incorporated into the Ixtepeque obsidian distribution zone. Nonetheless, it is not yet possible to dismiss the possibility that the decline of the Copan dynasty could have been the trigger for the increase in the acquisition of Ixtepeque obsidian.

Aoyama indeed mentions that the distribution of Ixtepeque obsidian expanded along the Caribbean coast after the collapse of the Copan dynasty [Aoyama 2017:227]. In fact, in the area surrounding Azacualpa, occupation during the Late Classic and Postclassic periods have been confirmed, at least in the Cerro Palenque site in the lower Ulua River Valley, east of the Quimistan Valley. Results obtained after analyzing 439 pieces of obsidian from that area through x-ray fluorescence [Hendon 2004] support what Aoyama mentions. Results indicate that 90% of the obsidian recovered during the Late Classic Period and approximately 80% of that from the Terminal Classic Period came from Ixtepeque [Hendon 2004:19]. This demonstrates again an increase in the acquisition of Ixtepeque obsidian in the outer periphery after the Late Classic period.

Hence, there are cases where Ixtepeque obsidian is distributed even in areas that lie outside of its distribution zone. It is necessary to pay particular attention to the timing of Ixtepeque obsidian rather than just consider it a straightforward indicator of the extent of Copan's influence.

Summary and Prospects

As described above, I have conducted an x-ray fluorescence analysis of obsidian artifacts excavated from the La Entrada region and the Azacualpa site, artifacts that had either not been analyzed or had previously been analyzed just by a visual analysis in order to investigate their source. Results are presented in this paper. As a summary, the following five points should be clear.

(i)Ixtepeque obsidian is majoritarian in most Category 5 sites in the Florida Valley, Category 4 and smaller sites in the Florida Valley, and Category 4 and smaller sites in the La Venta Valley.

(ii) In addition to Ixtepeque obsidian, San Luis obsidian is abundant in Category 5 sites, in the outer periphery, and in the La Venta Valley.

(iii) San Luis obsidian was also abundant at Los Higos during the Late Classic period.

(iv) As time went by, Ixtepeque obsidian increased its share in the proportion of obsidian found at the Los Higos and Azacualpa sites—evidence supporting a diachronic change in obsidian sources.

(v) Azacualpa acquired more obsidian from El Chayal and La Esperanza than what was previously thought.

The results of the analyses strengthen the conventional theory that Ixtepeque was the primary obsidian source for the La Entrada region. At the same time, they provide new evidence that shows that obsidian from San Luis was also abundant at Los Higos during the Late Classic Period and that obsidian from El Chayal and La Esperanza was certainly acquired at Azacualpa.
Kanazawa University is currently in the process of archiving some of the obsidian artifacts excavated during the La Entrada Archaeological Project and the Copan Archaeological Project. Since understanding the obsidian source ratio of obsidian found in each archaeological site will help to establish interregional exchange routes, research and source analyses of unanalyzed materials from the La Entrada area using x-ray fluorescence should continue.

Several new obsidian artifacts have recently been excavated in Copan. Based on the analysis of obsidian excavated from Groups 9L-22 and 9L-23, which the Copan Archaeological Project investigated, and from Structures 10L-7 and 10L-11, which are currently under investigation, further research should aim at clarifying the interregional exchange between Copan and the surrounding area. In particular, focusing on the connections with Central Honduras and Northwestern Honduras, their objective should be to present a new picture of the obsidian trade network in the southeastern Maya region.

Acknowledgments

I would like to express my gratitude to my supervisor, Professor Seiichi Nakamura, for his support in many ways, including the permissions he granted to be able to access certain obsidian artifacts and his advice for this research. I sincerely acknowledge Professor Nakamura for his pioneering cooperation with local institutions and for the working network he continues to maintain in order to facilitate research.

I received a grant from the Chozen Project, Kanazawa University, to conduct this research. I express my deepest gratitude to Dr. Takuro Adachi and all the professors and institutions for their help in making this research project advance.

Notes

1 Although the chronology of the Maya civilization differs slightly between researchers, it can be divided into three significant periods: the Preclassic Period (2000 BC~250 AD), the Classic Period (ca. 250-900 AD), and the Postclassic Period (900 ~ 16th century) [Sharer and Traxler 2006:155]. The Classic Period —the main focus of this paper— is further subdivided into the Early Classic Period (250-600 AD), the Late Classic Period (600-800 AD), and the Terminal Classic Period (800-900 AD).

2 However, from the perspective of pottery research, etc., points have been made concerning exchange relationship between Copan and Central Honduras [e.g., Gerstle 1987]; this does not imply that exchange between the two had not been pointed out at all in previous research.

3 The La Entrada Archaeological Project classified sites into six categories based on the size of the mounds, the complexity of the settlement pattern, the extension of the site, and its presumed function [Nakamura 1991b:12-14]. Excluding the "special" category, categories 1~5 are based on the correlation of numerals with size: the larger the class, the larger the site. Azacualpa corresponds to Category 5.

4 There is a difference between the number of artifacts included in this investigation and the number of artifacts that Aoyama included in his preliminary report of 1992, but this is due to some artifacts that were still unscreened at the time of publication of such report.

5 However, the plots concentrated in San Luis within this discriminant map may include those that initially correspond to a still undetermined Source Y that may exist in the vicinity of San Luis [Aoyama 1999:243]. San Luis and Source Y should be considered separately, but since there are no source stone samples to determine such Source Y objectively, they are treated here as one and the same. Discrimination between the two should be a future issue.

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Cosmic Ray Imaging at the Copan Archaeological Site

Kunihiro Morishima

This short report describes the interior survey of Temple 11 at the Copan archaeological site using cosmic ray imaging, which has been conducted with Prof. Seiichi Nakamura of Kanazawa University since 2018.

First, a brief explanation of cosmic ray imaging is explained. Cosmic rays are high-energy radiation that travels through space. Its main components are nuclei of proton and helium. When protons and other particles collide with the Earth's atmosphere, new particles are generated in the upper layers of the atmosphere. These particles include subatomic particles called muon, which have extremely high penetrating power due to their properties. Muons are falling at a rate of one per square centimeter per minute from all directions toward the earth's surface, and can penetrate materials up to several kilometers in length. These properties can be used to visualize structures above and below ground as with X-ray radiography.

So far, the authors have used cosmic ray imaging to visualize the interior of the Fukushima Daiichi Nuclear Power Plant and the Pyramid of Khufu (Fig.1). At the Fukushima Daiichi Nuclear Power Plant, the author succeeded in visualizing the core meltdown inside the nuclear reactor damaged by the Great East Japan Earthquake by observing from the structure next to the reactor building, called the turbine building. In the visualization of the interior of the Pyramid of Khufu, we discovered an unknown huge void in the center of the pyramid by observing from the Queen's Chamber in the pyramid [Morishima 2017]. Furthermore, by visualizing the upper part from what we call the descending corridor, we also discovered a corridor-like cavity behind the gabled structure called the Chevron on the north face of the pyramid. Thus, this technology has achieved results such

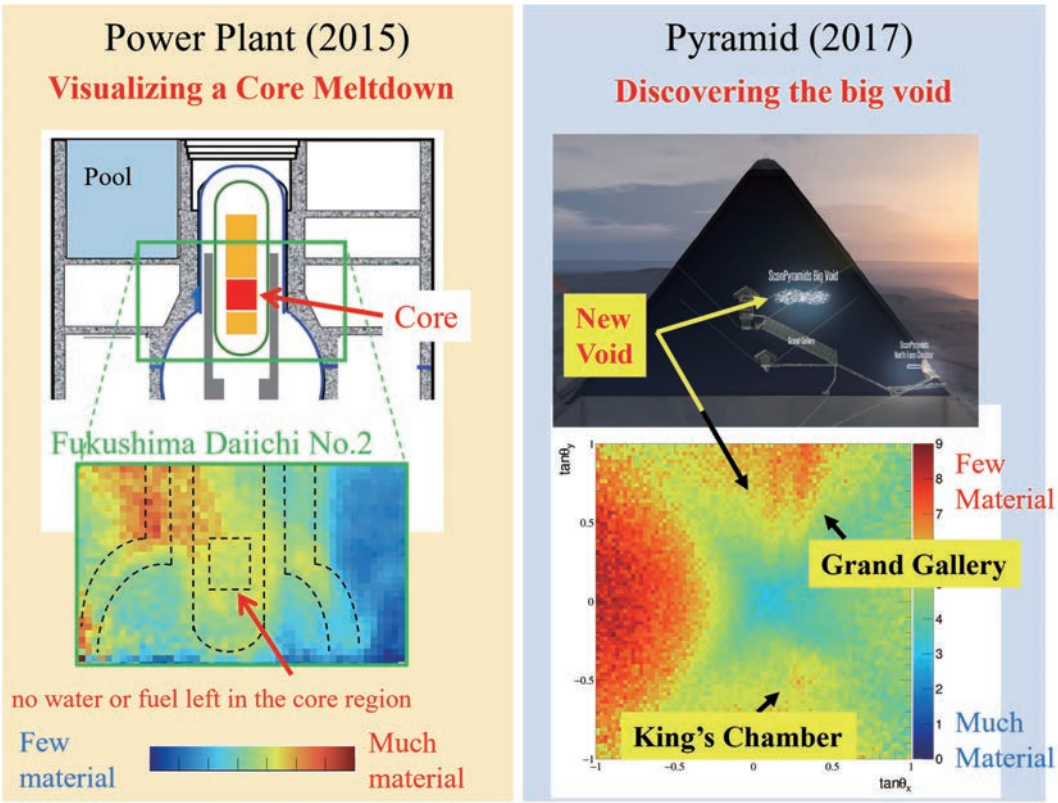

Figure 1 Examples of visualization by cosmic ray imaging. Left: Fukushima Daiichi Nuclear Power Plant Unit 2. Right: Pyramid of Khufu.

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Figure 2 Temple 11 at Copan Ruins

as the discovery of two unknown structures inside the Pyramid of Khufu in Egypt by cosmic ray imaging.

The Copan archaeological site survey conducted in 2018 and 2019 is the first study to be applied in earnest to the Mayan archaeological site survey. During the Copan site survey, several nuclear emulsion plates [Morishima 2022] were installed in the tunnels inside Temple 11 (Fig.2). Nuclear emulsion plates are photographic film-type radiation detectors (Fig.3). By photo-developing and fixing the radiation trajectories recorded in the nuclear emulsion plates, it is possible to analyze three-dimensional trajectories with submicron precision. After development, the nuclear emulsion plates are analyzed using an optical microscope to take advantage of their resolution. For the analysis of nuclear emulsion plates, an automated nuclear emulsion scanning system called Hyper Track Selector (HTS) developed at Nagoya University based on an optical microscope is used to digitize the cosmic-ray muon tracks recorded on the nuclear emulsion plates. Using the databased track information, an internal image of the target was obtained by cosmic rays transmitted through Temple 11.

The detectors installed inside Temple 11 are shown in Figure 4 and 5. The nuclear emulsion plate is fixed between aluminum plates facing in the direction to be visualized. The compactness of the detector, which requires no power source, makes it very suitable for measurements inside the archaeological site. After a measurement period of one to two months, the detector was collected and brought back to Japan to be developed. The nuclear emulsion plates were then read by the HTS to produce a cosmic ray image. An example of a cosmic ray image obtained from nuclear emulsion plates placed inside the tunnel of Temple 11 is shown in Figure 6. This image shows the directional distribution of cosmic rays, with the center of the image perpendicular to the nuclear emulsion plate. The vertical and horizontal axes indicate tanθ, where 1 corresponds to 45 degrees. The red color indicates the direction in which more cosmic rays were detected, and the blue color indicates the opposite, that fewer were detected. The non-uniformity of the directional distribution of cosmic rays indicates the density distribution of the material comprising Temple 11 integrated in each direction from the location of the detector.

The obtained image of the cosmic rays clearly identified a structure containing a passageway in the upper part of Temple 11 (Fig.7). When viewed from the center of the site, the upper passage-like structure was recognized as a depression of about 2 meters in relation to the walls on both sides of the structure, so that more cosmic rays were visualized as coming from the area of that passage than from the surrounding area. Thus, using the known structure, we were able to confirm the extent to which a structure of about 2 meters could be visualized. Next, the central region of Temple 11 was examined to see if there were any regions where more cosmic rays came from compared to the

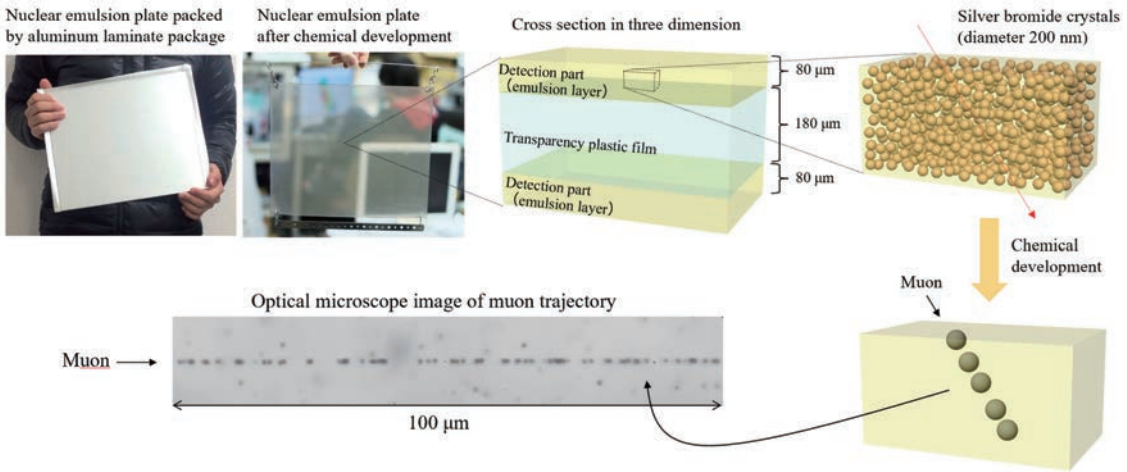

Figure 3 Nuclear emulsion plate. A latent image is generated and recorded on a 200 nm silver bromide crystal in the path of the charged particles in radiation. By developing the latent image into silver particle, muon tracks are fixed in the nuclear emulsion plate. The trajectory can be measured by observation with a optical microscope.

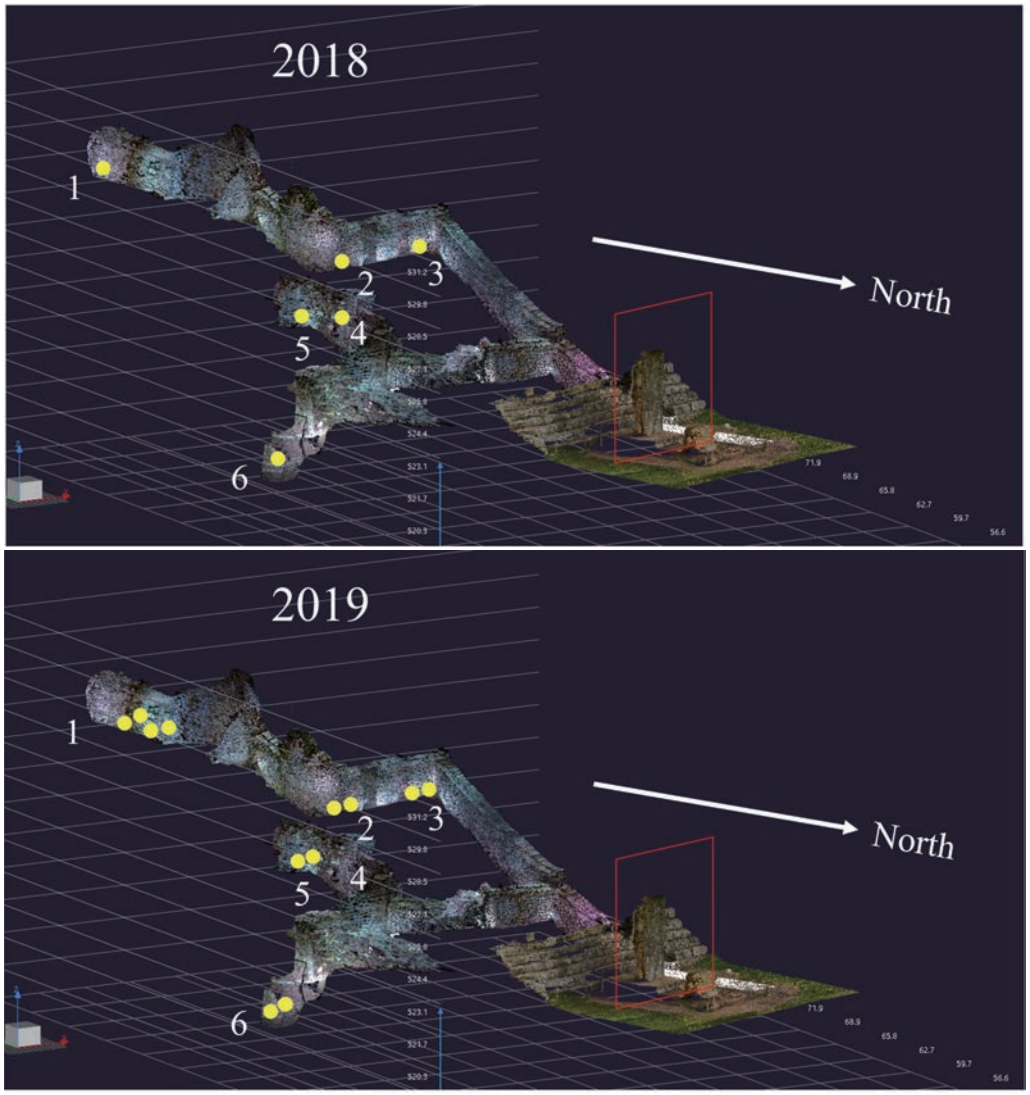

Figure 4 Inner tunnel of Temple 11 pyramid and location of detectors in 2018 and 2019.

Figure 5 Aluminum plate detectors installed in the tunnel of Temple 11 Pyramid in 2018 and 2019.

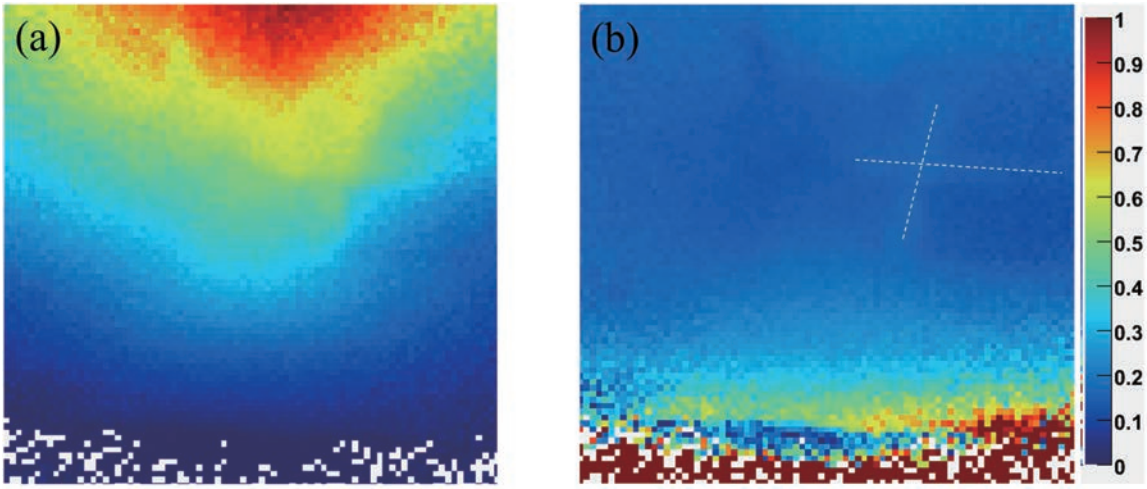

Figure 6 Cosmic ray image obtained from Detector 1 of Temple 11 installed in 2018. (a) Distribution of cosmic ray muon flux, (b) Distribution of transmission rate obtained from cosmic ray muon flux. The structure of the passage was confirmed along the dotted line.

Figure 7 Structure of the upper passageway of Temple 11

surrounding area, but as in the above, no structure was identified that could be recognized as a cavity of about 2 meters. Based on these results, a cavity of about 2 meters in length left in a hollow state was not detected within the confirmed region, but the possibility remains that the space was not detected because it had collapsed, a point that requires attention in the cosmic ray survey. The cosmic ray imaging cannot distinguish between a cavity that did not exist at the time of construction and a cavity that collapsed and filled in later, so it can only be detected as a clear image if it remains as a cavity.

During the measurement of Temple 11, some technical problems arose due to the tuff which is the main stone material that make up the Copan archaeological site. Specifically, the trajectory of radiation from the tuff was recorded on the nuclear emulsion plate during the measurement, and this affected the analysis of cosmic ray muons, which we wanted to capture as a signal, as noise. As a countermeasure, we shortened the observation period from 60 days for the first observation to 44 days for the second observation. Such measures are necessary when observing sites composed of sedimentary rocks of volcanic origin such as tuff, so care must be taken in future measurements. On the other hand, for sites composed of limestone, such as the Egyptian pyramids, long-term observations over a period of several months are possible. For example, among Maya sites, the Tikal archaeological site is composed of limestone, and therefore, cosmic ray imaging under better conditions is considered possible.

In the future, we expect that cosmic ray imaging will be actively applied not only to the additional survey of the Copan archaeological site targeted in this study, but also to other Maya sites such as the Tikal archaeological site, and that interesting new findings will be obtained as Maya archaeology.

Acknowledgments

I am very grateful to my collaborators, Prof. Seiichi Nakamura and Masahiro Ogawa of Kanazawa University, for their great cooperation in conducting this research in Honduras. I also thank the Honduran Institute of Anthropology and History for their full support. This work was supported by JSPS KAKENHI Grant Numbers JP18H03470, JP20KK0008 and JST, PRESTO Grant Number JP18069661, Japan.

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A Study on Cultural Resource Management in Copán Ruinas, Honduras

Makiha Gokita

Introduction

Local communities' role in international cultural heritage conservation strategy is expanding, as community participation in the planning stage is expected to enhance local identity and raise awareness of cultural heritage conservation, while also promoting local development through the use of cultural heritage. Many researchers from around the world have studied the Maya site of Copán in Copán Ruinas, Honduras, since the 1880s, and as one of the centers of research on the Maya civilization, it has provided many important theories. At the same time, as one of the earliest sites in the Maya area to be registered as a World Heritage site, it is expected to play a pioneering role in cultural heritage conservation and utilization. This paper considers the museum to be a nexus between cultural heritage and the local community and examines the ideal form of cultural resource management in Copán Ruinas.

Cultural Resources and Cultural Resource Management

The terms "cultural resources" and "cultural resource management" emerged in the 1970s in the U.S. archaeological field as a counter term to "natural resource management" [King 2002]. In Japan, several universities and research institutions have established departments and institutes that use the term "cultural resources" in their name, beginning with the establishment of the Department of Cultural Resources Studies at the University of Tokyo in 2000. In Japan, however, the terms "cultural resources" and "cultural resources management," as well as the academic field of "cultural resources studies," are still under discussion as each institution defines them. In this paper, the term "cultural resource" is used to mean "all kinds of tangible or intangible, human-made or natural elements that create the diversity and complexity of culture in the world," and "cultural resource management" is considered to be "an attempt to maintain cultural resources to make our lives and society better." These definitions were agreed upon by the International Network for Cultural Resources (CRM-IN) comprising alumni of the Cultural Resource Management Program within the Program for Leading Graduate Schools, Kanazawa University.

Cultural Heritage and Local Communities

The importance of local communities' involvement in the conservation and sustainable use of cultural heritage has been pointed out many times in documents related to World Heritage and in international charters on cultural heritage [UNESCO 1976; ICOMOS National Committees of the Americas 1996; ICOMOS 1999; UNESCO 2003; UNESCO World Heritage Committee 2007: 193; UNESCO World Heritage Centre 2012, etc.]. Similarly, museums have, from the outset, emphasized social relations, mainly from an educational perspective. From the perspective that museums deal with local culture and nature as the constituents of their collections, more emphasis has been placed on consideration of local communities and creating opportunities for participation in museum activities [UNESCO 1960, 2015; ICOM 2004, 2010; etc.].

Regarding museums' commitment to local communities, there exist various concepts and formats such as regional, local, and community museums, as well as eco-museums. This paper focuses on the regional museum, a term that is narrowly defined in Japan, as one method of cultural resource management.

The International Committee for Regional Museums (ICOM-ICR), one of the international committees of the International Council of Museums (ICOM), defines "regional museum" broadly as referring to "museums that collect, research and display objects and other relevant contents from a region" [ICOM-ICR 2013]. In Japan, however, regional museums are often discussed in a more limited sense as museums that seek to solve local issues through local residents' active learning, as Ito Toshiro theorized. Based on Takeuchi Junichi's discourse, Ito summarized a chronological flow of postwar museums, encompassing the first generation that focused on collection and conservation, the second generation that focused on public access to materials, and the third generation that focused on participatory experiences for the public. He also proposed regional museum theory, which divides museums into three broad categories based on differences in purpose, rather than based on a chronological sequence; each of the categories—central-oriented, tourism-oriented, and region-oriented—represents a unique mode [Ito 1993: 155-160].

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Based on Ito's classification, this paper considers the regional museum in the narrow sense, that is, a museum that (1) targets a specific region, (2) is led by local residents, (3) responds to regional issues through museum activities, and (4) fosters local residents' self-education skills through museum activities.

Museums in Copán Ruinas

The Copán site, located in Copán Ruinas, Honduras, is one of the centers of research on the Maya civilization; it is a locus where researchers from around the world have conducted research since the 1880s and put forward many important theories. Moreover, as one of the earliest sites in the Maya area to be registered as a World Heritage site, Copán is expected to play a pioneering role in cultural heritage conservation and utilization. To examine cultural resource management in the Maya area, this paper presents a case study of the museum activities in the nearby community of Copán Ruinas, which has a history of development as a base for visiting Copán site.

The city houses four museums: the Sculpture Museum located in the Archaeological Park, the Regional Archaeological Museum (hereinafter called "Archaeological Museum"), the Copán Digital Museum (hereinafter called "Digital Museum") facing the city's central park, and the Casa K'inich Children's Museum (hereinafter called "Children's Museum"), which is located on a hill overlooking the city center.

The Archaeological Museum was established in 1939 and is managed and operated by the Honduran Institute of Anthropology and History (Instituto Hondureño de Antropología e Historia, IHAH). The museum exhibits major archaeological artifacts such as ceramics, stone tools, and altars excavated from the Copán site (Fig. 1). The Sculpture Museum was established in 1996 and is managed and operated by the IHAH. The museum exhibits typical stone monuments such as stelas, altars, architectural decorations, and reconstructed structures from the Copán site (Fig. 2). The Children's Museum, established in 2002, is managed and operated by the Copán Association, a non-profit organization. The museum offers visitors a chance to learn about typical Mayan culture, such as letters, numbers, and ball games, through hands-on exhibitions such as moving panels (Fig. 3). The newest museum is the Digital Museum, which opened in 2015. The museum has introduced virtual reality (VR) technology from a Japanese company, and visitors can view a VR movie in a large VR theater. The museum also displays old photographs and official documents from the 19th and 20th centuries, allowing visitors to learn about the community's history (Figs. 4 and 5).

In the following paragraphs, the situation and issues of museums in Copán Ruinas are discussed, based on three surveys conducted prior to the opening of the Digital Museum in 2015 regarding the activities of the three museums that existed in Copán Ruinas at the time, specifically: (1) the actual situation of museum activities, (2) local residents' actual use and awareness of the museums and the Archaeological Park, and (3) educational use of the museums.

(1) Actual situation of museum activities

I visited three museums (the Archaeological Museum, the Sculpture Museum, and the Children's Museum) to interview museum staff about their roles and the museums' activities. The survey used a semi-structured interview format, in which the main questions were prepared in advance and additional questions were asked based on the respondents' answers. The three main questions concerned 1) a museum-specific vision and role, 2) exhibition plans, and 3) other museum activities.

Fig. 1 An exhibition at the Regional Archaeological Museum

Fig. 2 A stela and sculptures displayed at the Sculpture Museum

Fig. 3 Exterior view of Casa K'inich Children's Museum

Fig. 5 An exhibition about the community's history at Copán Digital Museum

The Archaeological Museum has no permanent staff specializing in archaeology or museology, and fixed-term employees employed by the IHAH work as ticket sellers and monitors, rotating days of the week with the ticket office of the Archaeological Park under IHAH's jurisdiction and other cultural facilities managed by the IHAH. The Sculpture Museum, like the Archaeological Museum, has a staff of ticket takers working on different days of the week, as well as a full-time museum manager. Given that the Children's Museum is managed and operated by the non-profit Copan Association, it is difficult to obtain accurate information about the museum's opening prior to visiting, as the museum is sometimes closed on an irregular basis. Even when the museum is open, there is only a receptionist but no staff specialized in archaeology or museology.

Interviews conducted at the three existing museums revealed that the two museums under the jurisdiction of IHAH, namely the Archaeological Museum and the Sculpture Museum, have a common national vision set by the IHAH but have not defined a museum-specific vision or role. Although the director of the

Fig. 4 Exterior view of Copán Digital Museum

Sculpture Museum has a personal view of the museum's role and vision as well as a personal vision for the museum's exhibitions, he said that because the exhibition plan is overseen by a single IHAH staff member domiciled in the capital, exhibitions cannot be easily changed onsite. The Children's Museum has its own objectives, but the exhibitions are fixed and have not changed since the 2012 renovation. As for projects with schools and programs other than exhibitions, the Archaeological Museum and the Sculpture Museum do not offer them, and the Children's Museum used to offer school invitation programs, etc., but no longer does. In other words, it is evident that fixed exhibitions and a lack of museum activities other than exhibitions, such as educational outreach programs, are common issues among museums in Copán Ruinas.

(2) Local residents' actual use and recognition of cultural facilities

Based on the situation and issues of the museums in Copán Ruinas, interviews were conducted to clarify how local residents actually use cultural facilities such as museums and the Archaeological Park and how they perceive those facilities. As with the survey of museum staff, a face-to-face semi-structured interview format was used. The main questions concerned 1) years of residence in Copán, 2) experience and frequency of visits to archaeological sites, 3) recognition of museums, 4) experience and frequency of visits to museums and motives for visiting/not visiting, 5) awareness of the new museum and related information sources, 6) interest in the new museum, and 7) functional expectations of the museums.

We interviewed 15 local residents, comprising nine males and six females, who ranged in age from their teens to their 50s. Respondents were selected via convenience sampling in the central park, and their ages and genders were distributed.

First, regarding Questions 1 and 2, all 15 respondents had

visited the Copán site, regardless of the number of years they had lived in Copán Ruinas. Regarding Questions 3 and 4, of the three museums, the Sculpture Museum attached to the site had the best visit experience, followed by the Archaeological Museum facing the central park, and the Children's Museum, which is slightly farther from the city center. The most common motive for visiting the archaeological site was "to learn about history," followed by "to enjoy nature." The most frequently cited motive for visiting a museum was "to learn about history." As for Questions 5 and 6 regarding the 2015 opening of the new museum, although most respondents had heard about the new museum from their acquaintances, they did not have detailed information. The most popular response to Question 7 was "collaboration with schools," followed by "cheaper price," "more interesting exhibits," and "holding events."

The interviews with local residents regarding their use and recognition of the museums and archaeological sites indicated that residents recognize the significance of the sites and the museums as places to learn about history, and they do visit them. However, mothers who are responsible for running their households frequently reported being preoccupied with their daily lives and having little interest in revisiting the sites. They also expect the museums to cooperate with schools. In other words, they would like their children to learn about history and nature through visits to archaeological sites and museums, but they are too busy to take them, so they want them to visit as part of their school education.

However, as the interviews with museum staff revealed, the museums are not currently engaged in any collaborative projects with schools nor are they conducting educational programs and producing guide materials for children. Taken together, the interviews with museum staff and local residents revealed that, despite the residents' desire for museum–school cooperation, the museums do not have a system in place to accept such cooperation.

(3) Schoolteachers' educational use of museums

What are the opinions of the schools that are expected to collaborate with the museums? The following analysis is based on interviews conducted during the author's stay in Copán Ruinas. Interviews were held at the library with four local public elementary school teachers who the host families personally approached. The interviews comprised three questions concerning 1) whether the teachers had incorporated the museums into their education program and why or why not, 2) how the museums responded to their classes' visits, and 3) what effects they expected from the students' museum visits.

Regarding Question 1 concerning the teachers' experience of using the museums, the Sculpture Museum was the most frequently used, followed by the Children's Museum; use of the Archaeological Museum was not mentioned. The fact that the teachers' experience of using the Archaeological Museum and the Children's Museum is reversed compared to usage trends in the general population indicates school personnel's familiarity with the Children's Museum. The majority of the respondents indicated that their reason for not using the Archaeological Museum was the cramped exhibition rooms, making it impossible for a single teacher to manage a class of 30–40 children in the museum at a time. Regarding Question 2, there were no specialized staff or guides to provide explanations, and the teachers had to explain the exhibitions to the children. For Question 3, "learning about our own culture" was a common response.

Interviews with teachers revealed that schoolteachers recognize that museums are facilities that can be used in school education as a place for students to learn about their culture. However, it was also revealed that they do not actually use the museums frequently because the museums do not have staff who can provide explanations during school visits. The interviews with museum staff also revealed that one of the barriers to teachers' use of the museums is the lack of educational programs and staff who can facilitate the delivery of such program content. To encourage elementary schoolteachers to use the museums in the context of school education, the museums must be able to accommodate large numbers of children in exhibition rooms and have staff available to divide the children into groups and provide explanations and other program features in order to deepen the students' understanding of the exhibitions.

Issues affecting museums in Copán Ruinas

A survey of local residents' use of the museums in Copán Ruinas prior to the opening of the Digital Museum revealed the following. First, the museums do not have their own vision or purpose, and because the staff are not experts in museology or archaeology but are mainly administrative staff, the museums do not have a system to voluntarily conduct museum activities such as exhibition planning and educational outreach. Regarding the actual situation of local residents' museum use, residents recognize the museums as places to learn about the history and have visited, but the return visit rate is low due to the fixed exhibitions, an issue that museum staff interviewees also raised. Another of the residents' expectation of museums is collaboration with schools. The correlation between the low return visit rate and the fact that

local residents do not take their children to the museums, as well as the absence of a system to conduct educational activities such as school collaboration, were also highlighted as issues facing the museums.

The situation of the Copán Digital Museum

(1) Schoolteachers' actual use of cultural facilities

In the previous section, lack of cooperation with schools was pointed out as an issue facing museums in Copán Ruinas prior to the opening of the Digital Museum. Based on this, this section examines the relationship between teachers and local cultural facilities, including the Digital Museum, based on a survey conducted among teachers at elementary, middle, and high schools located in the urban area of Copán Ruinas. The questionnaire survey was administered in October 2018 to identify trends regarding teachers' experiences visiting archaeological sites and museums and their use of these sites within the framework of school education, as well as their plans for future visits and use and the reasons for non-visitation.

According to the Honduran social studies curriculum guidelines for basic education, history education, including community history and the protection of cultural properties, begins in Grade 2 (for ages 7–8 years) in October, and considerable time every year thereafter is devoted to history education up to Grade 6. For example, the Grade 4 basic education schedule includes a daily social studies period, alongside Spanish, math, and science. Additionally, in a unit slated for Grade 4 in June concerning studying the importance of history and historical research methods, museums are mentioned as one of the resources for learning history, and it is expected that museums will be used as part of school education [SEDUC 2009: 21].

According to 2018 data from the Honduran National Institute of Statistics (Instituto Nacional de Estadística Honduras, INE), the population of Copán Ruinas is 41,684, among whom 9,151 people live in the urban area, which is the center of tourism to the archaeological site [INE 2018: 1-3]. In the urban area, there are two public schools and two private schools (Fig. 6), with 72 teachers and 1,149 students ranging from age 4 years (pre-school education) to age 18 years (students who have completed their secondary education and are preparing to enter university). A private school is located slightly outside the urban area in the administrative division and is attended by many urban residents; their teachers number 25, while enrollment totals 408 students between the ages of 3 years and 18 years (as of November 2018). This research administered a questionnaire survey to 97 teachers in these five schools on the way cultural heritage is addressed in school education, such as references to archaeological sites and their contents, as well as on the actual use of cultural facilities such as archaeological sites and museums. We visited each school and distributed the questionnaires to the teachers through their principals. When we revisited the schools a few days later, we collected 56 questionnaires (57.7% collection rate).

Fig. 6 A public school in Copán Ruinas

Regarding the teachers' age distribution and gender ratio, 75% were female, the majority of female teachers were in their 40s or younger, and approximately 78% of all the teachers were in their 20s to 40s. Regarding the teachers' social studies teaching experience, given that the subject is closely related to cultural heritage, 75% of the respondents indicated that they had experience. Many basic educational schools in Honduras have a homeroom teacher system similar to that in Japan, except for certain subjects such as English and information technology. In private schools that offer both basic and secondary education, teachers usually cycle through the grades. This is thought to be the reason for the sampled teachers' relatively high level of experience in social studies education.

Crosstabulation of the results regarding experience teaching social studies and in-class mention of archaeological sites and museums showed that 97.6% of the teachers with social studies teaching experience indicated mentioning the Copán site. On the other hand, those with no experience and those who did not respond to the question showed a 20–30-point difference, at 60% and 66.7%, respectively, suggesting a correlation between social studies teaching experience and references to the Copán site. History (including ancient civilizations) was the most frequently mentioned subject and was reported by more than half of the respondents, which is consistent with the results showing a high mention rate among teachers with social studies teaching experience. Other subjects mentioned included ethnic groups, tourism, and mathematics (numbers). The 60% of teachers with no social studies teaching experience who mentioned archaeological sites

in their classes were upper basic education teachers teaching Grade 5 and above; they mentioned sports, language, writing, mythology, economics, etc., in relation to the Copán site. High school teachers also indicated referencing the site in relation to ethnic groups. No significant correlation was found between social studies teaching experience and level of personal experience visiting archaeological sites and museums.

Compared to the percentage (69.6%) that visited (including plans to visit) the Children's Museum, which had the highest use rate among the museums, a large portion (94.6%) of the sampled teachers visited or plan to visit the Copán site as part of their classes. A difference of 26 percentage points was noted, indicating that educational use of the site is higher than that of the museum. The reason for this is the availability of guides at the site; that is, while trained tour guides are always available at the Copán site, the museum does not have professional staff to explain the exhibitions, which can be inferred to be the reason for poor educational use.

Regarding the experience of teaching social studies, teachers with social studies education experience tended to have more experience using all facilities than those without social studies education experience. This finding suggests that the experience of teaching social studies affects educational use of cultural facilities.

The difference between the proportion of the sample with experience of educational use and the proportion with plans for future use can be regarded as indicative of whether the site will be reused, i.e., the revisit rate (Table 1). The revisit rates for all cultural facilities were negative, lending credence to the inference of a low level of satisfaction with visits to archaeological sites and museums. Among the cultural facilities, the Digital Museum had a lower negative rate than the other facilities and can be expected to be a facility capable of responding to educational use among the cultural facilities in Copán Ruinas in the future. One of the reasons for this is thought to be the unique interpretations of the exhibitions the staff of the Digital Museum have been providing since its opening. The presence of a guide was cited as a reason educational use of the site was higher than that of the museum, and it is thought that the presence or absence of staff who can provide explanations during visits affects the visit rate and the intention to visit.

(2) Staff awareness

In March 2017, an interview survey of four people with experience working in the Digital Museum was conducted to identify changes in their attitudes before and after working in the museum. The survey format was face-to-face and semi-structured. It was found that three of the four respondents had done exhibition interpretation. One respondent, who basically did not provide explanations, indicated that he had learned a set of content so that he could explain it when "important people" visited the museum.

All the respondents indicated not knowing what to say in their exhibition interpretations before they started working at the museum but that they became knowledgeable about the exhibit and how to explain them while working at the museum due to tuition from a colleague.

It was also found that staff members who voluntarily explain the exhibits often learn and deepen the content. As they learn more about the exhibitions, they find it interesting to learn new things; they experience a knowledge-seeking impetus, which forms a learning cycle. They also indicated deriving pleasure from seeing visitors satisfied after viewing the exhibitions complemented by their explanations and that they came to like teaching others. These findings clearly indicate that even if exhibition interpretation was initially an inherited job, visitors' direct positive responses led to a sense of accomplishment and satisfaction, which, in turn, led to behavioral changes such as spontaneous learning and attitudinal changes such as increased interest in and attachment to the history and cultural heritage of the community covered in the exhibition. The results also revealed that this led to a change in consciousness, such as increased interest in and attachment to the community's history and cultural heritage.

The Digital Museum's Regional Museum Potential

The Digital Museum differs from the other museums in Copán

Table 1 Experiences of and plans for educational use of cultural facilities (n=56)

	Educational use experience	Planned educational use	Difference (revisit rate)
Copan site	85.7%	62.5%	-23.2
Sculpture Museum	57.1%	23.2%	-33.9
Archaeological Museum	41.1%	16.1%	-25.0
Digital Museum	51.8%	37.5%	-14.3
Children's Museum	62.5%	35.7%	-26.8

Ruinas because of the way it was established. The Digital Museum's most important feature is that, while the other museums focus on the Copán site and the Maya civilization, the Digital Museum also deals with the Copán site and the Mayan civilization, which are the most important features of Copán Ruinas. Furthermore, it has an historical connection to the city's establishment and development since the 19th century, and it plays the role of a museum where local residents can learn about the community's history, in response to the city's request for such a facility at the time of its establishment. The community history exhibits include items collected from citizens [Nakamura 2019: 27-31]. The museum building was originally constructed as an elementary school, and some of the local residents who attended the elementary school still live in the city. The fact that immediately after its opening, approximately half of the museum's visitors were local residents suggests that local residents were highly interested in the museum. This, in turn, indicates that the Digital Museum can function as a community-oriented museum that is closely connected to the community and is a place of memory for local residents, as described in regional museum theory, rather than as a tourism-oriented museum.

However, a community-oriented museum or regional museum is not only meant to deal with a geographically specific region; it also aims to address the issues of people living in the region through its museum function. In this regard, the current situation as identified in the surveys, namely that the museums in Copán Ruinas do not conduct educational activities or collaborate with schools as the local residents expect them to, can be regarded as representative of one of the issues in Copán Ruinas. Another reason teachers cited for not using museums for educational purposes is the lack of museum staff who can explain the exhibits and facilitate other services during museum visits; this can also be regarded as one of the issues facing Copán Ruinas. How is the Digital Museum responding to these issues? With regard to the latter, we found that the Digital Museum staff voluntarily provide informal interpretation of the exhibits. Regarding the former, the questionnaire survey of schoolteachers on the use of cultural facilities in Copán Ruinas showed that the Digital Museum had the lowest negative intention to revisit rate among teachers, which suggests that the Digital Museum is responding to the desire for cooperation between museums and schools in Copán Ruinas through its exhibition interpretation activities, and the results are being reflected in teachers' intention to return to the museum.

In regional museum theory, it is fundamental that local residents take the initiative to address regional issues, and the regional museum's role is to develop and support local residents through its museum functions. The Digital Museum staff are local residents employed by the IHAH. Since their tasks are related to the daily management of the museum, they are not professionals with expertise in museology or archaeology but rather ordinary citizens, just like the visitors. The interviews with staff revealed that successive generations of museum staff voluntarily took over the role of interpreting the museum's exhibitions from their predecessors and that they not only read from panels but also supplement the expository content with information not included on the panels that they gathered themselves through research. In this respect, it can be said that the Digital Museum encourages the development of self-education skills through its museum function, in which local residents take initiative and undertake learning independently. Based on the above characteristics of the Digital Museum and its situation, it can be pointed out that the Digital Museum is beginning to function partially as a regional museum.

Conclusion

Finally, the Digital Museum's future direction is discussed. Unlike the Archaeological Museum and the Sculpture Museum, the Digital Museum has mainly exhibited panels and reproductions, as it was decided at the planning stage not to place original materials in the museum due to security issues. Additionally, given the nature of its establishment and operation, the Digital Museum is not included in the package ticket with the Archaeological Park. Thus, the Digital Museum has several conditions that are inconducive to its functioning as a tourism-oriented museum. Moreover, in the wake of the unprecedented COVID-19 crisis, the Digital Museum which already had weak tourism content and no professional staff, has weakened further as a museum, as the building was used as a vaccination site and remains closed after the reopening of the Archaeological Park. Analysis of the characteristics of the Digital Museum revealed its potential as a community- rather than tourism-oriented museum, with a focus on local residents. Since it is imagined that it will take some time before the number of tourists to Copán Ruinas returns to its previous level, it may be time to steer the Digital Museum in the direction of wholly becoming a regional museum that caters mainly to local residents.

Acknowledgements

I would like to express my appreciation to the Honduran Institute of Anthropology and History, the municipality of Copán Ruinas, and all the local people of Copán Ruinas for their support and

cooperation in my field research. I am also particularly grateful to Professor Seiichi Nakamura for his thoughtful guidance. The firm relationship that he has built up in Honduras over the years has enabled me to obtain cooperation in the field. This research was partially supported by a research grant from the Konosuke Matsushita Memorial Foundation (No. 16-177), the Takanashi Foundation for Historical Science, and JSPS KAKENHI Grant Number JP18K12572.

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Persiguiendo el sueño de excavar pirámides en Mesoamérica: Las andanzas de Shione

Shione Shibata

Encuentro con el Maestro Kuniaki Ohi:

Dos veces fallé la prueba para entrar a la universidad, por fin aprobé para ingresar a la universidad privada en Kyoto. En esos momentos yo todavía soñaba en ir a Sudamérica y participar en un equipo de expedición que fuera hacia la zona en que se encontraba la evidencia de la civilización Andina. Yo imaginé que durante el trabajo de campo se viviría en la naturaleza y se necesitaría la práctica de montañismo, por lo que, entré al club de montañismo en la Universidad. Un estudiante del club quien iba un año adelante que yo, me preguntó qué iba estudiar en la Universidad, a lo que le contesté que yo quería estudiar a la antigua civilización Andina; a bien tuvo él recomendarme tomar la clase con Maestro Kuniaki Ohi sobre la historia antigua de Mesoamérica.

El primer día de clase el Maestro Ohi apareció en el aula. El Señor no era tan alto, sin embargo, era robusto con barba y lentes. Él fue karateca. Después de la clase yo consulté al Maestro sobre mi deseo de estudiar la antigua civilización Andina. El Maestro Ohi me dijo que el primero yo podría estudiar la antigua civilización mesoamericana, ya que en tiempos antiguos y lejano ambas civilizaciones habrían tenido algunas relaciones. En aquel entonces, el Maestro Kuniaki Ohi fue el primero y único investigador japonés que había tenido la experiencia de participar en las excavaciones en México por más de 10 años bajo la dirección del Dr. Román Piña Chan, un arqueólogo mexicano reconocido de ese país. Es así, como decidí ser su discípulo ese día.

Mochilero japonés en Mesoamérica:

El primero año de la Universidad yo andaba en las montañas. Ya para el segundo año comencé a participar en las excavaciones de sitios arqueológicos y los trabajos de gabinete en el Museo de Heian, actual Museo de Kyoto con el fin de aprender las técnicas relacionadas a la investigación arqueológica.

Además, yo había asistido a la clase del seminario sobre el estudio de la antigua cultura de Mesoamérica impartida por el Maestro Ohi, la cual se daba en el Museo de Heian los días sábados. Después de finalizar el seminario la actividad continuó como la Asociación de Estudios Mesoamericanos que fue representada por el mismo Maestro.

Estudiantes de diversas universidades participaron en dicha asociación, dentro de quienes se encontraba el Sr. Nobuyuki Ito. Él recién se había graduado de la licenciatura en arqueología y su especialidad fue la civilización Olmeca. Cuando el Sr. Ito llegaba a Kyoto para participar en la actividad de la asociación, se quedaba en el pupilaje en donde vivía yo, propiciando que pudiéramos charlar sobre nuestros intereses. En el año de 1986 el Sr. Ito partió de Japón para viajar al continente americano, con el deseo de sentir a las antiguas civilizaciones de América Latina a través de sus cinco sentidos.

Por otro lado, yo también había planificado un viaje a México por un año después de terminar el tercer año de estudio universitario, sin embargo, no fue una forma oficial de estudiar en alguna universidad de México, sino que visitar los sitios arqueológicos de la época prehispánica y, a la vez aprender a conversar en idioma español.

Yo aterricé en el aeropuerto internacional de la Ciudad de México el día 11 de junio del año 1987, momento en el que comenzó mi vida en dicho país por el lapso de 10 meses. La situación económica de México en los 80s estaba muy mal. Al bajar del avión sentí un fuerte olor a gasolina, esto por causa de la severa contaminación del aire en el entonces D.F., recuerdo que en ese momento era tiempo de lluvia. Caminando por la ciudad, encontré en un callejón una taquería en la que se podía observar su foco incandescente y el vapor del agua que caída sobre la plancha, en ese momento me sentí triste y me pregunté si yo podría vivir en ese lugar por 10 meses.

Pero, al poco tiempo este sentimiento desapareció bajo el cálido Sol de México y su gente alegre. Antes del regreso a Japón en el mes abril del año 1988 yo había viajado al Altiplano de México, Michoacán, Costa del Golfo, Chiapas, Oaxaca, Norte de Yucatán, Peten, Altos y Costa Sur de Guatemala, visitando más de 50 sitios arqueológicos. Paralelamente a esto, mi habilidad de hablar español mejoró y fui teniendo menos problemas en la conversación cotidiana.

Al regresar a Japón me inscribí al último año de la licenciatura, graduándome en el año de 1989. En este punto, yo había

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definido el rumbo que debía tomar mi vida, es decir, estudiar una maestría en la Universidad de Kanazawa, de cuya escuela también estudiaba el Sr. Ito, quien ya había comenzado su carrera profesional, él me sugirió entrar a dicho centro académico. En marzo de 1989, se me aprobó la entrada a la escuela de posgrado de la Universidad de Kanazawa.

Proyecto Kaminaljuyú:

Desde el tiempo universitario en Kyoto el Maestro Ohi nos comentaba sobre los proyectos que él tenía como sueño desarrollar. "Se podría llevar a cabo un proyecto arqueológico en Panamá, ya que hay plan de construir el segundo canal de Panamá." "Hay posibilidad de excavar esferas de Costa Rica.", entre otros. Una vez yo le dije al Maestro Kuniaki, "Serían mentiras.", el maestro me regañó diciendo "Que tonto eres! Soñar es muy bueno. Soñar en grande es mejor."

No obstante, la mentira del Maestro Ohi convirtió en realidad. Se formó el Proyecto Interdisciplinario de Guatemala patrocinado por la Tabacalera Japonesa. Se llevaron a cabo las investigaciones académicas en la Zona Sur Maya ubicada entre los altos de Guatemala y la costa del Océano Pacífico desde el mes enero del año 1991 hasta el marzo del 1994. El Proyecto arriba mencionado fue multidisciplinario, ya que abarcó aspectos relacionados con la arqueología, historia, etnología, botánica, estudio vulcanológico, antropología física y sondeo geofísico.

"Bravo! Yo podría participar en la excavación de pirámides de Mesoamérica!" Con tanta alegría al llegar a la Ciudad de Guatemala, nos estaba esperando una dificultad. El Instituto de Antropología e Historia de Guatemala (IDAEH) no nos otorgó inmediatamente la autorización de realizar la investigación arqueológica.

Se había firmado oficialmente el convenio de investigaciones entre el Ministerio de Cultura y Deportes de Guatemala y la Tabacalera Japonesa, no obstante, en dicho convenio no se menciona concretamente el nombre del sitio arqueológico a excavar. Solamente se indicaba la zona de investigación que abarca desde la Ciudad de Guatemala hasta la costa del Océano Pacífico con dimensión de 70 km de Norte a Sur y 20 km de Este a Oeste.

Había razón para esto. Según el Maestro Ohi el sitio arqueológico Kaminaljuyú es un sitio importantísimo en la historia de la época prehispánica [Fig 1], por lo que a los guatemaltecos no les gustaría que el sitio arqueológico fuera excavado por un equipo de extranjeros.

El Maestro Ohi y Sr. Ito visitaban casi diariamente a la sede del IDAEH para resolver el asunto pendiente con el director de la entidad gubernamental. Finalmente, 2 meses después se alcanzó el acuerdo y nos otorgó la autorización para excavar en el Parque Arqueológico Kaminaljuyú. Aunque se realizaron el levantamiento topográfico, sondeo geofísico, fotogrametría por sonda, 2 calas de prueba, al iniciar la excavación en 2 trincheras en un montículo, se nos hizo suspender la investigación dentro del Parque Arqueológico Kaminaljuyú [Foto 1]. La causa podría ser la pelea entre las autoridades, el departamento que administra parques arqueológicos y otro departamento que supervisa investigaciones arqueológicas, los cuales pertenecían al IDAEH.

Es así, que se nos autorizó otra área fuera del Parque Arqueológico Kaminaljuyú, en donde comenzó una nueva excavación. Durante 3 años de investigación arqueológica se excavaron 2 montículos, uno de los cuales se pudo convertir en un pequeño parque arqueológico. Sobre los resultados de la investigación arqueológica en Kaminaljuyú se publicó el informe final en japonés y español en el año de 1994 [Ohi 1994].

Proyecto Chalchuapa:

Después de regresar de Guatemala, volví a la escuela de posgrado de la Universidad de Kanazawa y me gradué de la maestría en

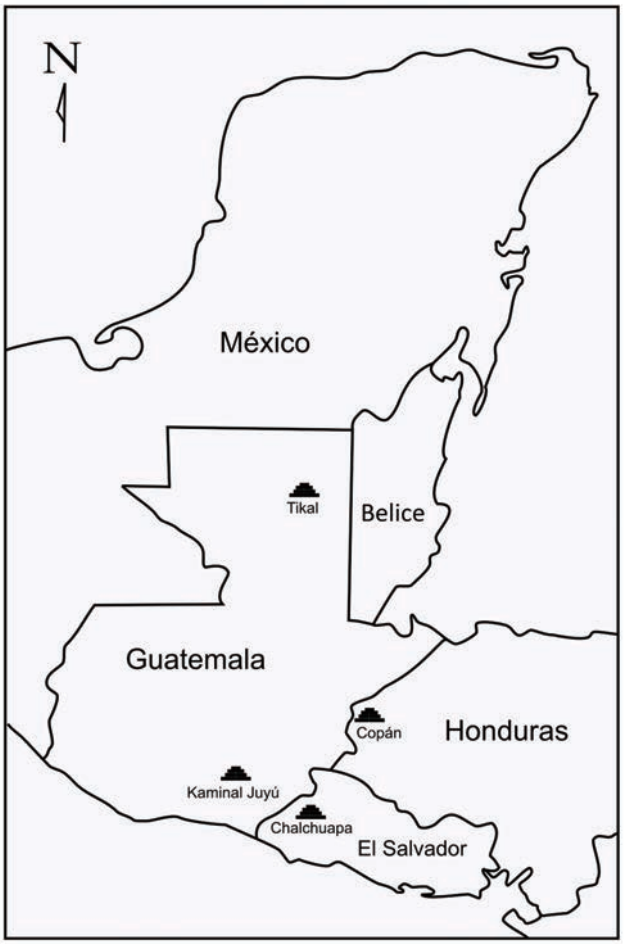

Fig 1: Ubicación de los sitios arqueológicos Kaminaljuyú y Chalchuapa

Foto 1: Estructura de talud- tablero en la Acrópolis del Parque Arqueológico Kaminaljuyú.

el mes marzo del año 1995. La experiencia que había obtenido por 3 años en el Proyecto Kaminaljuyú fue muy valiosa, sin embargo, me parecía que todavía faltaba mucho para ejercer como buen arqueólogo en Mesoamérica.

El Maestro Ohi seleccionó el sitio arqueológico Chalchuapa ubicado en El Salvador [Fig 1], el vecino país de Guatemala para el próximo campo de investigación. Este sitio arqueológico sería ideal para verificar los resultados obtenidos en el Proyecto Kaminaljuyú, ya que ambos se encuentran dentro del mismo complejo cerámico perteneciente al Período Preclásico. Además, el Maestro Ohi tenía estrecha relación con las autoridades del Consejo Nacional para la Cultura y el Arte, CONCULTURA, ellos mismos mostraban el deseo de que el equipo del Maestro Ohi realizara el proyecto arqueológico en El Salvador.

Pero, apareció otro problema para llevarlo a cabo, en este caso relacionado a los fondos para las investigaciones. En la primera mitad de los 90s la economía de Japón se encontraba todavía algo buena, no obstante, al entrar la segunda mitad de los 90s la situación económica del país cayó abruptamente y ya sería difícil contar con empresas que patrocinarían proyectos culturales. Por lo tanto, el Maestro Ohi decidió solicitar el subsidio científico ante el entonces Ministerio de Educación, Ciencia, Deportes y Cultura del Gobierno de Japón.

El Maestro Ohi me dijo "Ve primero a El Salvador. La misión es tener una buena relación con el personal de CONCULTURA y así dialogar acerca de la autorización del Proyecto Chalchuapa, realizar la investigación preliminar en el Parque Arqueológico Casa Blanca y mejorar el estado actual del futuro centro de investigación ubicado en el mismo Parque.", en este sentido yo llegado a El Salvador en el mes de septiembre del año 1995 para cumplir con esta misión.

La Dirección Nacional de Patrimonio Cultural del CONCULTURA emitió la autorización temporal para el Proyecto Chalchuapa. Se realizaron el levantamiento topográfico y 2 calas de prueba, todo esto se ejecutó mientras yo vivía en la casa ubicada dentro del Parque Arqueológico Casa Blanca. Los estudiantes japoneses, quienes vinieron de Japón participaron en el trabajo de campo junto con los estudiantes salvadoreños de la carrera de licenciatura de arqueología. La investigación preliminar en Casa Blanca se logró con gran éxito.

Un año después de mi llegada a El Salvador, otro problema grande sucedió en el lado de Japón. No se aprobó la solicitud del subsidio científico que el Maestro Ohi solicitó en el año 1995 ante el Ministerio de Educación, Ciencia, Deportes y Cultura, en ese momento ya el fondo para poder vivir en El Salvador se estaba agotando. Según lo que me comentaron posteriormente los compañeros de Japón, el Maestro Ohi comenzó a pensar en el regreso de mi persona a Japón y el retiro del Proyecto Chalchuapa de El Salvador, sin embargo, gracias por el caluroso apoyo de los presidentes respectivos de Tanaka Geological Consultant y Kyoto Computer System, las cuales habían colaborado con el Maestro Ohi desde el tiempo del Proyecto Kaminaljuyú, el Proyecto Chalchuapa podría continuar por lo menos un año más. Afortunadamente, se aprobó el subsidio científico del Gobierno de Japón en el año de 1997, por lo tanto, se firmó oficialmente el convenio entre el CONCULTURA y el Maestro Kuniaki Ohi de la Universidad de Estudios Extranjeros de Kyoto. El Proyecto Chalchuapa dio inicio formalmente. El Proyecto consistió siempre en los aspectos relacionados a la arqueología, historia, etnología, lingüística, sondeo geofísico y estudio vulcanológico. Justo Sierra (1848-1912), político y humanista mexicano, manifestó la importancia de la investigación y conservación de vestigios arqueológicos de la época prehispánica (Cámara Baja, 28 de octubre de 1880) y declaró el valor y efecto de la restauración y conservación de los sitios arqueológicos (discurso de apertura del XVII Congreso Internacional de Americanistas en 1910 en México) para la integración de México como un país moderno. Manuel Gamio (1883-1960), gran arqueólogo mexicano, aplicó la idea de Sierra a las investigaciones en la zona arqueológica Teotihuacán a su manera entre 1917 y 1921 [Gamio 1922; León-Portillo 2002]. De esta manera se convirtió el eje central de la arqueología mexicana, la cual aprendió el Maestro Kuniaki Ohi durante su estadía en México.

En el sitio arqueológico Kaminaljuyú no se pudo restaurar la estructura prehispánica hecha de tierra por el mal estado de conservación, no obstante, en el Parque Arqueológico Casa Blanca se pudieron excavar 3 estructuras prehispánicas hechas de tierra, las cuales fueron restauradas y conservadas [Foto 2; Fig 2]. En lo personal me sentí satisfecho de ver las estructuras restauradas

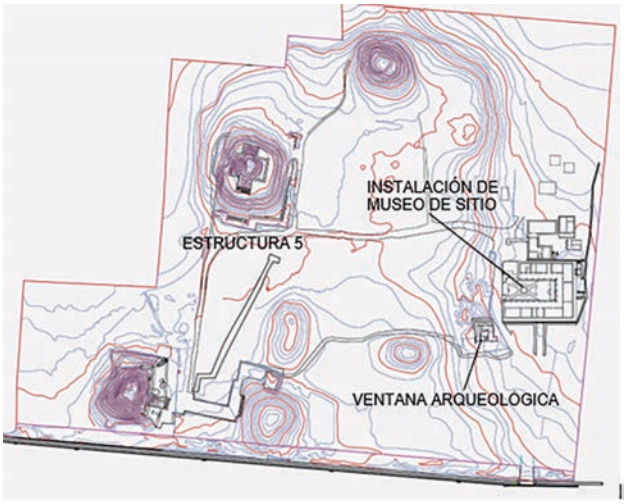

Fig 2: Plano del Parque Arqueológico Casa Blanca.

y conservadas, las cuales son apreciadas hasta la fecha por los visitantes al Parque.

Por otro lado, para llevarse a cabo una investigación arqueológica a largo plazo, es indispensable preparar una vivienda con el mejor ambiente, esto como una de las sugerencias del Dr. Piña Chan. Antes de iniciar oficialmente el Proyecto Chalchuapa se buscó una casa de tipo colonial para ser sede del Proyecto en la ciudad de Chalchuapa, pero esto fue en vano. Con base en esa idea, se hizo la remodelación del centro de investigación construido en la década de los 80s dentro del Parque Arqueológico Casa Blanca. Además, se construyeron una vivienda y un área con ducha y sanitario utilizando adobe, piedra, madera y teja con apoyo de una empresa constructora salvadoreña, la Alcaldía Municipal de Chalchuapa y Tanaka Geological Consultant.

Los 3 estudiantes salvadoreños de la carrera de arqueología quienes participaron en la investigación preliminar, junto con otros 2 estudiantes fueron contratados como investigadores. Ellos trabajaron de lunes a miércoles en la Dirección Nacional de Patrimonio Cultural y de jueves hasta el sábado se hospedaron en el centro de investigación de Casa Blanca, participando en la excavación durante el día y recibiendo por la noche las clases impartidas por el Maestro Ohi y otros investigadores del Proyecto. Estas materias son del marco de la carrera de la licenciatura de arqueología en la Universidad Tecnológica de El Salvador. Finalmente, los 5 estudiantes presentaron respectivamente sus tesis de graduación y se graduaron en el mes diciembre del año 2000.

El Proyecto Chalchuapa finalizó los trabajos en El Salvador en marzo de 2000, cuyos resultados se publicaron como informe final en la versión japonesa y la española a mediados del mismo año [Ohi 2000].

Foto 2: Estructura 5 del Parque Arqueológico Casa Blanca.

Proyecto Arqueológico de El Salvador:

Después de finalizar el Proyecto Chalchuapa, decidí quedarme en El Salvador, ya que me parecía que habría más cosas que hacer en el campo de la arqueología. Tuve una gran oportunidad de obtener un puesto de asesor en la Unidad de Arqueología de la Dirección Nacional de Patrimonio Cultural y pude independizarme del equipo del Maestro Ohi. En el mes septiembre del año 2000 se formó el nuevo proyecto denominado Proyecto Arqueológico de El Salvador junto con el Sr. Nobuyuki Ito.

Lo de siempre fue que había poco fondo para nosotros y cada uno apostaba para que camine el Proyecto. Gracias por el apoyo de la Dirección Nacional de Patrimonio Cultural se pudo obtener la autorización correspondiente, pudiendo ejecutar la excavación bajo nuestra propia dirección de la trinchera 4N del Parque Arqueológico Casa Blanca con el fin de investigar el inicio de la ocupación en dicha área.

Durante el tiempo del Proyecto Teotihuacán (1917-1921), el Arqlgo. Manuel Gamio enfatizó el mejoramiento del ingreso económico de los indígenas que vivían alrededor de la zona arqueológica, capacitándolos para elaborar suvenires de barro y obsidiana [Gamio 1986; León-Portillo 2002]. Tomando en cuenta las actividades sociales dirigidas por Gamio se planificó el resurgimiento de extracción de añil natural y técnicas de teñido con tintes naturales para elaborar suvenires, basado en la sugerencia por el Sr. Hideo Kojima, especialista de teñido y Lic. Lorenzo Amaya, investigador e impulsor del resurgimiento de añil en El Salvador. Por lo tanto, CONCULTURA solicitó el envío de un voluntario japonés de la Agencia de Cooperación Internacional de Japón, JICA y en el año de 1999 la primera voluntaria japonesa llegó a Casa Blanca.

Por otro lado, el Proyecto de la construcción del museo de sitio Casa Blanca y el taller de añil el cual se planificó en el año de 1998, se solicitó dentro del marco de la Asistencia no-reembolsable a la comunidad del Gobierno de Japón, el cual fue

Foto 3: Museo de Sitio Casa Blanca

aprobado. En el mes marzo del año 2000 se firmó el convenio entre el Sr. Saburo Yuzawa, entonces Embajador de Japón en El Salvador y Sr. Roberto Hernández, presidente de la ONG de Chalchuapa. En un inicio se realizaron 4 calas de prueba con el fin de verificar si existía algún patrimonio arqueológico que amerite conservar en el área de construcción, posteriormente comenzó la edificación del museo de sitio. Aunque un fuerte terremoto azotó a nivel nacional y se suspendió temporalmente la construcción, se pudo recibir la inauguración de la obra y la apertura de Casa Blanca al público como parque arqueológico el día 22 de agosto del 2002 [Foto 3].

Mientras que la excavación en la trinchera 4N continuó hasta el año 2003, unos estudiantes japoneses participaron en la investigación arqueológica, sin embargo, el tiempo de estadía para ellos fue en promedio de unos 2 meses nada más. Sería ideal que estudiantes japoneses podrían vivir en El Salvador por más tiempo posible para conocer mejor la tradición y cultura autóctona de El Salvador. Como lo que el Sr. Ito y mi persona tuvimos la oportunidad de hacer durante nuestra participación en el Proyecto Kaminaljuyú, ¿Habría alguna manera para que estudiantes japoneses tengan ese tipo de experiencia? Por lo tanto, se concluyó utilizar el programa de envío de voluntarios japoneses dentro del marco de la cooperación internacional entre JICA y El Salvador.
Al observar la situación actual del Parque Arqueológico Casa Blanca, se necesitaban el mantenimiento de las estructuras prehispánicas restauradas y conservadas y el mejoramiento de la infraestructura del mismo Parque, no obstante, por el escasez del presupuesto y personas del CONCULTURA, sería difícil cubrir esas necesidades, por lo que sería eficaz solicitar al JICA el envío de voluntarios japoneses para el Parque Arqueológico Casa Blanca.

Con base en la discusión sostenida con la Dirección Nacional de Patrimonio Cultural del CONCULTURA, el primero fue el envío de la especialista de teñido. Posteriormente, se solicitó la participación de los voluntarios en arqueología, la ciencia de conservación y la arquitectura de paisaje. En consecuencia, se

Foto 4: Taller-escuela de añil en la instalación del Museo de Sitio Casa Blanca.

enviaron al Parque Arqueológico Casa Blanca 11 voluntarios japoneses de largo plazo de 2 años (cada uno colaboró por 2 años consecutivos) y 6 de corto plazo (colaboración de 2 meses como máximo) entre el año 1999 y el 2013. Se logró transmitir las técnicas de teñido con añil natural para suvenires [Foto 4], las investigaciones arqueológicas y la restauración de las estructuras, el mejoramiento de la entrada principal, la construcción del techo para la trinchera 4N con el objetivo de que funcionara como una ventana arqueológica para los visitantes, la capacitación de los estudiantes salvadoreños de la carrera universitaria de la arqueología, entre otros.

Desde el año 2004 el Proyecto Arqueológico de El Salvador trasladó el campo de investigación hacia el Parque Arqueológico Tazumal, una de las 10 áreas en que consiste la zona arqueológica Chalchuapa finalizando en el año 2012 [Ito 2016]. El Parque Arqueológico Tazumal se inauguró hace más de 70 años como primer parque arqueológico del país y el complejo arquitectónico de Tazumal se utilizó para el diseño del extinto billete de 100 colones. Es decir que Tazumal es un ícono del patrimonio arqueológico de El Salvador [Foto 5].

En los años de 2012 y 2013 a consecuencia de la petición del Proyecto Arqueológico de El Salvador, Tanaka Geological Consultant realizó el sondeo geofísico en las áreas de Casa Blanca y El Trapiche. Actualmente, el Dr. Nobuyuki Ito sigue investigando en la Finca San Antonio ubicada en el área de El Trapiche, Chalchuapa.

Palabras finales:

Ya pasaron 35 años después de mi primera visita a México, persiguiendo el sueño de excavar pirámides en Mesoamérica. En un inicio sentí mucha dificultad de excavar el basamento piramidal hecho de tierra en el sitio arqueológico Kaminaljuyú de Guatemala. En la zona arqueológica Chalchuapa de El Salvador

Foto 5: Complejo arquitectónico del Parque Arqueológico Tazumal.

se excavaron 3 estructuras prehispánicas hechas de tierra, los cuales fueron restauradas y conservadas, logrando abrirlo como parque arqueológico. Además, se pudo resurgir la tradición de tinte natural de añil, cuyos productos se venden como suvenir en cualquier lugar de El Salvador.

Desde el año 2000 comencé a trabajar en el campo del patrimonio cultural de El Salvador, dentro del cual mi interés abarcó no solamente los sitios arqueológicos de la época prehispánica sino también los de las épocas coloniales y republicanas.

A consecuencia de la pobreza y la violencia muchos salvadoreños y centroamericanos escapan de sus países, migrando hacia los Estados Unidos de América en forma legal o ilegal. ¿Cómo pensarían ellos sobre sus países de origen? Para saber la raíz de ese punto, voy a investigar más profundamente la historia de El Salvador y Centroamérica a través de la arqueología, la cual no debe ser vista de forma dividida provocada por la llegada de los españoles al continente americano, ya que es una mezcla entre las culturas prehispánicas, la época de contacto, la colonia, la república y así la historia es continua hasta la fecha, debido a que la temporalidad de la arqueología es desde la aparición de los humanos sobre el planeta hasta la época actual.

Agradecimiento:

Yo expreso mi sincero agradecimiento al Maestro Seiichi Nakamura por darme la oportunidad de escribir este artículo. El inicio de la investigación arqueológica en Mesoamérica por el Maestro Nakamura fue un año antes que yo iniciara mis estudios universitarios. En una reunión nos comentó que el Dr. Takeshi Inomata y él se sintieron como “bala de pistola” al momento de comenzar el proyecto arqueológico “La Entrada” en Honduras (ya que no tenían a sus profesores especialistas en Mesoamérica junto a ellos), dentro del marco de la Cooperación Internacional de Japón. Yo podría imaginar la dificultad increíble de aquel entonces. Cuarenta años después de dicho proyecto, lo interesante es que los arqueólogos graduados de la Universidad de Kanazawa laboran en Guatemala, Honduras y El Salvador, situación que me hace sentir muy orgulloso. Aquí reitero mi sincero agradecimiento al Maestro Nakamura. Espero que siga más investigaciones en Mesoamérica. Gracias.

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Chalchuapa y Kaminaljuyu: Dos Grandes Ciudades de la Costa Sur de Mesoamerica en el periodo Preclásico Tardío

Nobuyuki Ito

1. Introducción

Durante el Período Preclásico Tardío en la Costa Sur de Mesoamérica surgen dos importantes entidades políticas Kaminaljuyú y Chalchuapa (Figura 1), ambas ciudades influirían de manera contundente en los cambios políticos y culturales que, entre muchos otros, habrían sucedido en aquella amplia área geográfica, a pesar de la distancia entre ambas ciudades y posiblemente pertenecer a distintas filiaciones culturales (Kaplan 2011; Love 2016; Sharer et al. 2011). Chalchuapa y Kaminaljuyú alcanzaron un paisaje urbano de sociedades complejas, ejemplo de ello fue Kaminaljuyú que construyó un canal magno de riego para los cultivos alimenticios que funcionó entre el 700 a.C. al 200 d.C. (Barrientos Q. 1997; Popenoe de Hatch et al. 2002). En Chalchuapa, según el análisis del suelo, se logró aclarar que se sembraron cultivos de C4 (Ito et al. 2012, 2018), aunque aún no se sabe con exactitud de qué tipo, debido a que los surcos localizados se encontraron por debajo de la ceniza volcánica del volcán Ilopango (TBJ) que cubrió todo el paisaje en el Occidente de El Salvador en el siglo 5 (e.g. Smith et al. 2020). Por otra parte, en el Antiguo Cuscatlán se encontraron surcos de cultivo con una fecha calibrada entre el 820 a.C., junto con cerámica del complejo Colos, correspondiente al Preclásico Medio. Sobre esa milpa de importante extensión, se evidenciaron restos físicos de maíz (Amaroli y Dull 1999), por lo que se infiere que el cultivo principal de los surcos, debajo de TBJ, fue maíz (Planta de C4, e.g. Martínez 2022).

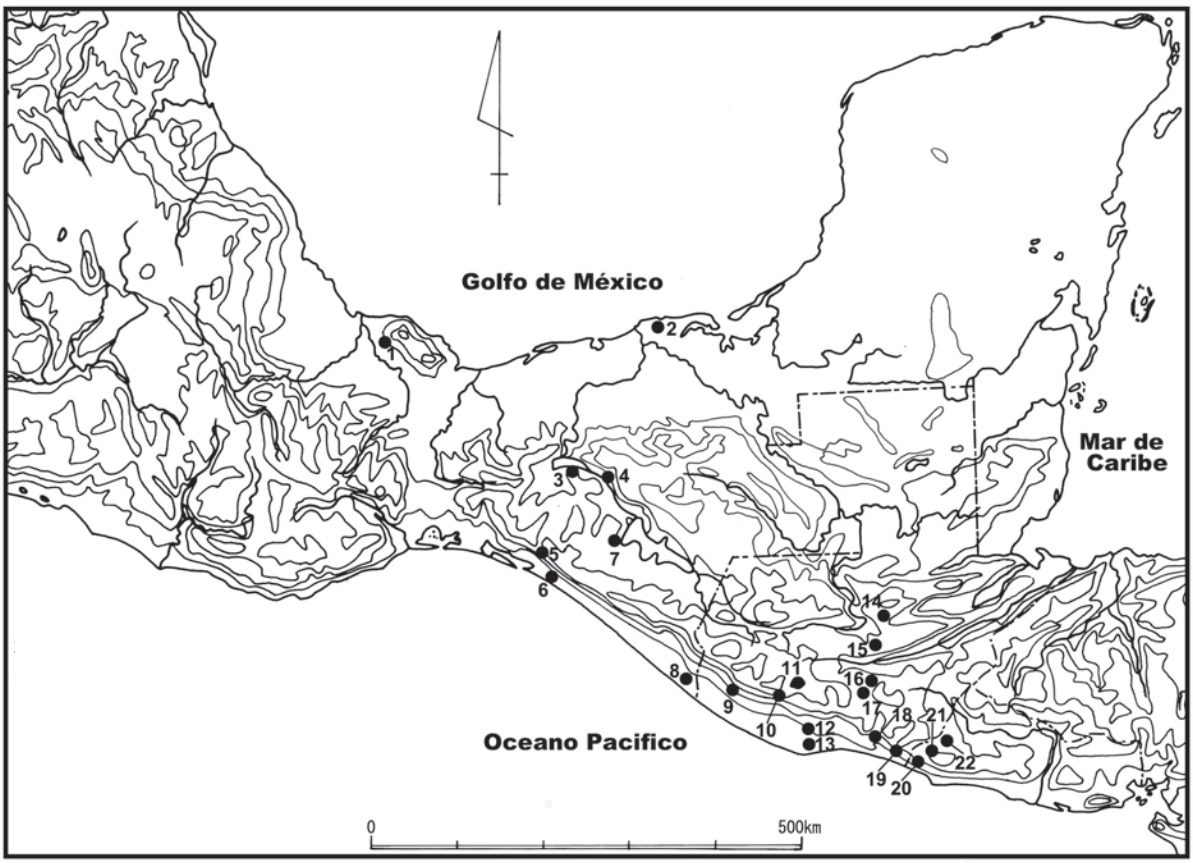

Figura 1 Sitios arqueológicos relacionados con Chalchuapa
1. Tres Zapotes, 2. La Venta, 3. Mirador, 4. Chiapa de Corzo, 5. Iglesia Vieja, 6. Tzutzuculi, 7. Padre Piedra, 8. Izapa, 9. Tak'alik Ab'aj, 10. Chócola, 11. Samabaj, 12. El Baúl, 13. Monte Alto, 14. Los Mángales, 15. El Portón, 16. Naranjo, 17. Kaminaljuyu, 18. Ujuxte, 19. Nueve Cerros, 20. Cara Sucia, 21. Ataco, 22. Chalchuapa

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En Kaminaljuyú y Chalchuapa, hubo una importante intensificación agrícola durante el período Preclásico Tardío (Ito 2008). Por otra parte, es indispensable vincular la economía de Chalchuapa con el yacimiento de obsidiana de Ixtepeque, y a Kaminaljuyú con el de El Chayal (Alvarado Hernández 2012; Braswell et al. 2011; Michels 1979; Sharer ed. 1978; Sheets 1978) para poder explicar parte del desarrollo acelerado de sus economías.

El análisis químico de obsidiana de Santa Leticia mostró que 7 muestras son provenientes de Ixtepeque, mientras 2 de El Chayal (Demarest 1986). La mayoría de obsidiana que se encontró en Quelepa es de Ixtepeque desde el Preclásico Tardío (Uapala: 200 -200 DC) hasta el Clásico Tardío (Lepa: 750-950 DC) (Braswell et al. 1994). En Joya de Cerén se encontraron instrumentos líticos de obsidiana, la mayoría los cuales provienen de Ixtepeque (Sheets 1983, 2002).

Tomando en cuenta los datos mencionados, habría que cuestionar: ¿Cómo se gobernaban las comunidades grandes y pequeñas en una sociedad compleja, durante el periodo Preclásico? ¿Cuál fue el sistema de administración, organización política y religiosa en el periodo Preclásico Tardío?

2. Antecedentes

En el año 1990 comenzaron las investigaciones arqueológicas en Kaminaljuyú, Guatemala y Chalchuapa, El Salvador (Ohi ed. 2000), dirigidas por un equipo científico japonés que hasta la fecha han logrado obtener datos e información clave para reconstruir la parte de la historia del Sureste de Mesoamérica, establecer escenarios hipotéticos y responder preguntas de investigación sobre la cultura material e ideología específicas, no solo sobre cada ciudad o entidad política, sino también sobre su interacción con otros sitios.

3. Objetivo general

Este artículo tiene como objeto presentar información sobre las esculturas monumentales, las estelas esculpidas de estilo maya temprano, estelas y altares lisos vinculadas al paisaje urbano con base en los datos obtenidos de los proyectos en que el autor de esta intervención ha participado, analizando las dos principales entidades políticas, Kaminaljuyú y Chalchuapa, enfocando la interpretación en los datos más recientes. Para lograr lo anterior se presentarán los monumentos encontrados en Chalchuapa; se explicará la presencia de una posible jerarquía religiosa a través del análisis iconográfico del monumento conocido como la Cabeza de Jaguar Estilizado; se aportará la explicación del hallazgo de la estela con la fecha de Bak'tun 7; también se dará un reconocimiento a los monumentos lisos, como estelas y altares; y como conclusión, a través de los datos presentados, se discutirán los cambios culturales relevantes entre dos ciudades o entidades políticas, como Kaminaljuyu y Chalchuapa.

4. Esculturas Monumentales en Chalchuapa

Durante la investigación arqueológica dirigida por Boggs y Sharer, se encontraron varias esculturas pétreas en Chalchuapa las cuales no fueron registradas en el informe de Sharer (Sharer ed. 1978). En el caso del Monumento 22 contiene un error del contexto arqueológico en dicha publicación, el cual se corregirá en este artículo.

a. Monumento 22 y tres monumentos más.

Durante las excavaciones por Boggs, en Tazumal, se encontraron los tres Monumentos (Figura 2: 2,3,4). El monumento liso que podría ser un altar, se encontró contra la base del lado Este de la Estructura 1a y bajo la última etapa arquitectónica de B1-1 del período del Clásico Tardío (Carnegie Institute of Washington 1929a).

Otro monumento es una tabla de escoria, como fragmento o panel esculpido en bajo relieve, que presenta como motivo dos volutas giradas hacia adentro (Figura 3a), aparentemente representan un par de cejas de Cabeza de Jaguar Estilizado o una base, como se observa debajo de la figura en la Estela 11 de Kaminaljuyu (Figura 13b). Se encontró en la pared Oeste de la

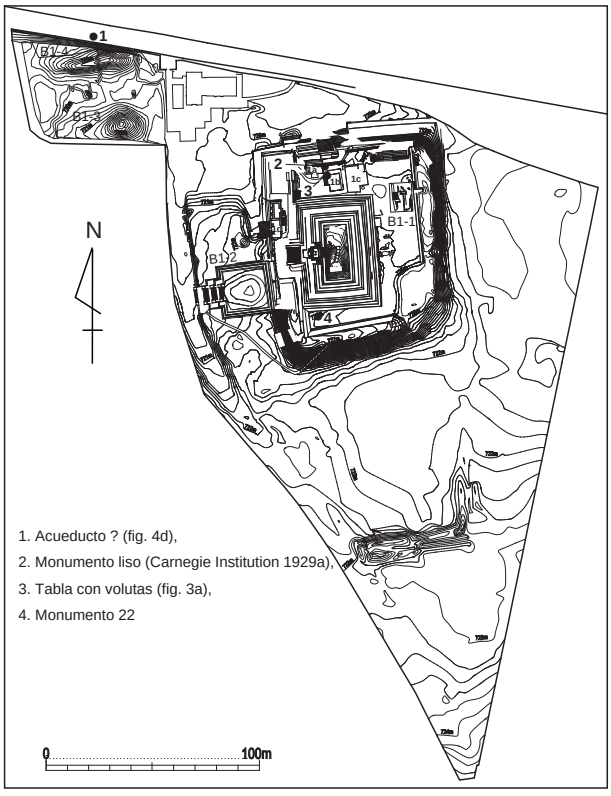


Figura 2 Monumentos en Tazumal, Chalchuapa

Estructura 1b, la cual pertenece al período Clásico Tardío (Carnegie Institute of Washington 1929b).

Al sur del entierro 14b (Clásico Temprano), se localizó un incensario rectangular esculpido en los cuatro lados con pintura fugitiva de colores blanco, rojo, amarillo y azul. En el lado superior hay una cavidad ovoide con fondo plano que mantenía carbón y cenizas (Figura 3b, c; ADAM s.f.).

Por otro lado, el Monumento 22, registrado como de contexto arqueológico en la Estructura B1-4 (Anderson 1978), en las fotos del Archivo del Museo Nacional de Antropología (ADAM s.f.), se evidenció que el monolito estaba acostado con el lado quebrado hacia abajo, el ojo derecho hacia arriba, y la cresta sagital hacia el Este, al sur de la Estructura piramidal B1-1 (Figura 2). La escultura está partida verticalmente, la mitad derecha corresponde a la Cabeza de Jaguar Estilizado y estilisticamente mantiene una diferencia con otras. La nariz es más realista o semejante a la de un ser humano, mantiene cresta en el centro del rostro con la parte superior un poco más ancha que la inferior. El periodo de este monumento no se puede saber por falta de información arqueológica, no obstante, Anderson considera que posiblemente pertenece al Clásico Terminal o Posclásico Temprano.

b. Dos monumentos en Casa Blanca

Se halló una escultura (Figura 3d) en un hoyo saqueado en el lado Este de la Estructura E3-8 (Comunicación personal con Paul Amaroli 2017). La figura está sedente derecho con las piernas dobladas hacia atrás y las manos puestas en las orejas o nuca. Tiene cuerpo barrigudo y posible casco en la cabeza con representación facial de estilo olmeca.

Otro monumento (Figura 4a) se localizó en la plaza rodeada por las Estructuras C3-4, 5, 6 y 7 en el área de Casa Blanca (Figura 5). Según la información dada por los empleados del parque, una parte de esta escultura estaba descubierta, la cual luego se sacó. Se trata de la representación de un animal sedente decapitado, que sobresale de una columna cuadrada, que sostiene un trono tetrápode sobre el cual está sentado el animal, posiblemente se trate de un jaguar con la cola enrollada atrás y el miembro viril al frente (Ito 2000b). En Guatemala se encuentran varios pedestales con mesa-altar tetrápode, entre los cuales se observan genitales masculinos solo en dos pedestales guatemaltecos (Ito 1998).

c. Monumentos encontrados por la Universidad de Estudios Extranjeros de Kioto

Durante la investigación arqueológica realizada por la Universidad de Estudios Extranjeros de Kioto, se descubrieron dos monumentos (Figura 5: 5,6). Una cabeza independiente (Figura 4b) se encontró en el piso donde desplanta la escalinata de la Estructura 1 (C1-1). Tiene forma discoidal y un lado esculpido bruscamente, el cual representa el rostro descarnado de un mono o ser humano, ya que solo se encuentra la cavidad en la parte de los ojos (Ito 2000b). En El Jocote, también se encontró una escultura de un cráneo frente de la escalinata de la Estructura A-1, la cual corresponde al periodo Posclásico Tardío (Ichon 1979; Ichon y Grignon 1981).

Otro monumento (Figura 4c) se encontró frente a la pared del muro norte de la Estructura 2 (C3-3). En el piso de esta estructura se identificó una cavidad (3.3 x 1 m) en que sembró esta escultura. Consta de dos partes, cabeza y cuerpo, el rostro presenta la mejilla hinchada y la parte bucal no está definida. La cabeza representa una dualidad, como cráneo descarnado y la otra parte normal. La cabeza tiene una protuberancia semejante a la cresta sagital, la cual también tienen las Cabeza de Jaguar Estilizado, los Barrigones de Cotzumalguapa (Monumentos 46, 47, Bilbao), el Monumento 3 (Concepción), el Monumento 5 (Tonalá), el Monumento 5 (La Venta) y el Monumento 5 (Cerro de Las Mesas), entre otras (Ito 2020). El cuerpo es redondeado con otro rostro invertido con ojos, nariz y cabello, detalle que quedó inconcluso (Figura 4c; Ito 2000b).

d. Tres monumentos descubiertos durante la investigación realizada por Shione Shibata

Se encontró un monumento en la zanja del lado norte del Cementerio Tazumal, está quebrado a la mitad debido a la excavación de la misma zanja (Figura 2 y 4d). Tiene una canaleta en el centro de la parte superior, por lo que Shibata cree posible se trate de una piedra de moler (Shibata 2005), también podría ser una escultura de acueducto, como los Monumentos 45 y 47 de Kaminaljuyu (Parsons 1986). También se encontró un fragmento de acueducto de piedra en la superficie de la Estructura 1 (B1-1; Carnegie Institute of Washington 1929c, d).

Otro monumento se localizó en el área de Nuevo Tazumal (Figura 3e). No se sabe nada de su contexto arqueológico (Comunicación personal con Shione Shibata 2021). Está trabajada rústicamente para tener una forma cuadrada. Tiene una cavidad de 30 cm de diámetro en el lado superior y un rostro antropomorfo o zoomorfo por dos ojos y boca esculpidos en el lado lateral. En la Costa Sur de Mesoamérica, se encuentran altares con cavidad en el lado superior y/o rostro en el lado lateral (Ito 2013, 2015). Sin embargo, no se encuentra ninguna escultura semejante.

Otra escultura monumental se encontró en el lado sur de la Estructura 6 (C3-7; Figura 5 y 6b), durante la excavación en la Extensión 8 de la Trinchera 1 que realizó Shione Shibata en Casa

Figura 3 Monumentos en Tazumal, Casa Blanca, Nuevo Tazumal y El Trapiche
Tazumal: a, b, c; Casa Blanca: d; Nuevo Tazumal: e (Foto por S. Shibata); El Trapiche: f

Blanca. En una cavidad del periodo Posclásico, estaba dispuesta con el lado tallado hacia arriba. Shibata cree que este monumento Preclásico se reutilizó en el período de Posclásico (Comunicación personal con Shione Shibata 2021).

e. Cuatro monumentos encontrados durante la excavación realizada por Akira Ichikawa.

Durante la excavación realizada por Akira Ichikawa, se encontraron tres monumentos (Ichikawa 2007; Ichikawa et al. 2009). Al frente de la Estructura 5c (C3-6) una Estela Lisa y al sur de la misma un Altar Liso. Los Monumentos pertenecen al período Preclásico Tardío por la estratigrafía y los materiales asociados. Al lado oeste de la Estela Lisa se encontró una escultura del tipo "Cabeza de Jaguar Estilizado". Ichikawa sugiere que se trata de una ofrenda a la estela lisa.

Se localizó también un fragmento de escultura en un estrato del Preclásico Tardío, realizada en la excavación en La Cuchilla, al Sureste del Parque Arqueológico de Casa Blanca (Ichikawa y Shibata 2007, 2008, comunicación personal con Akira Ichikawa 2021). Es un fragmento de escultura con bajorrelieve, en el cual tiene un diseño antropomorfo en el perfil izquierdo.

f. Cuatro monumentos descubiertos por la Universidad de Nagoya

Durante la investigación arqueológica de la Universidad de Nagoya, se encontraron dos Cabezas de Jaguar Estilizado y dos fragmentos de estela al sur de la Estructura E3-1 (Figura 7 y 8). En la Trinchera 1-2, una Cabeza de Jaguar Estilizado (Cabeza 1) estaba sembrada en el piso, no encontrándose ninguna oquedad posterior para instalarla (Figura 9a). Se cree que la escultura formó parte de la instalación del piso, incrustándola al nivel de la orilla de su rostro para ser mostrada viendo al cielo. La mitad

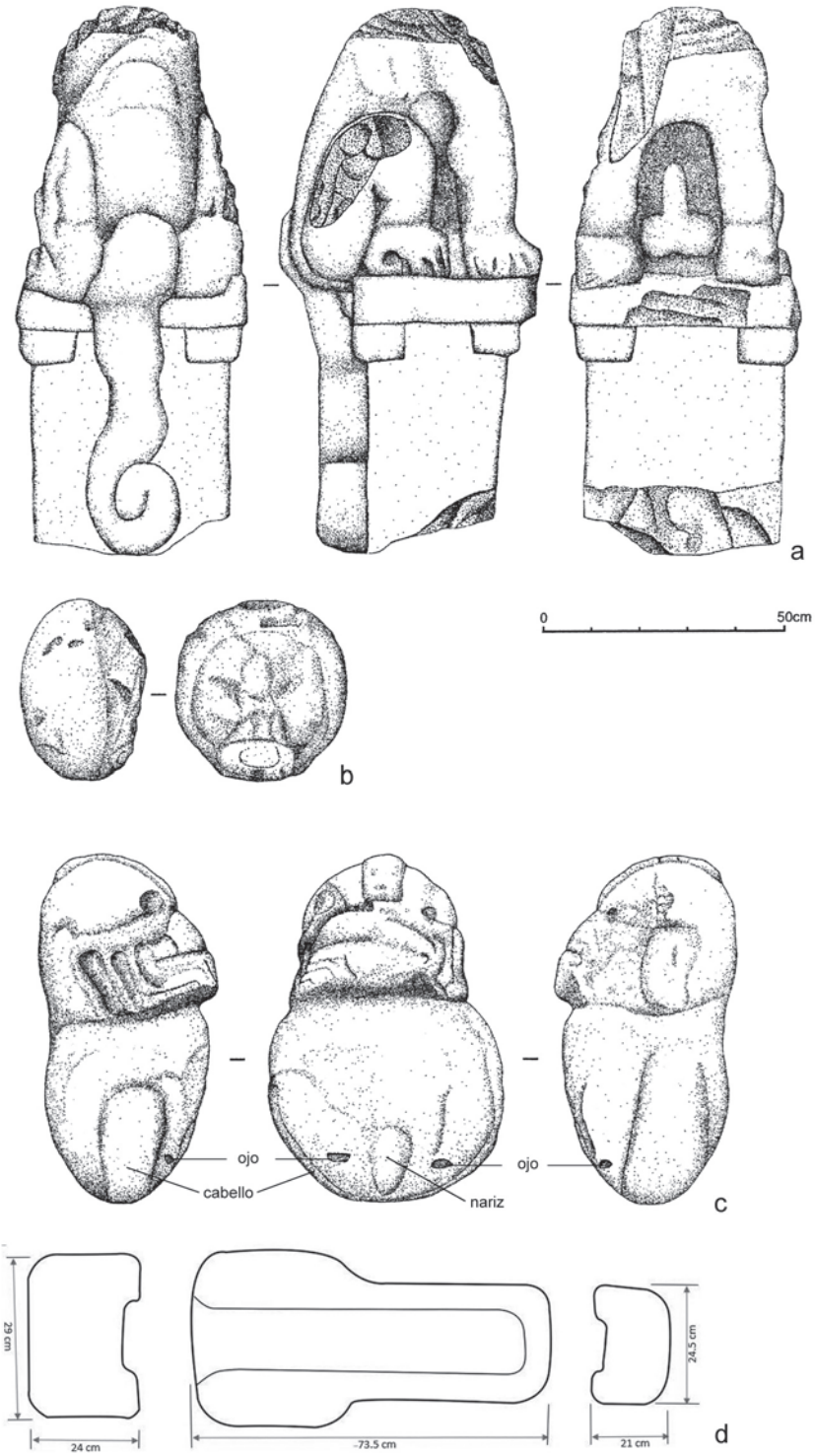
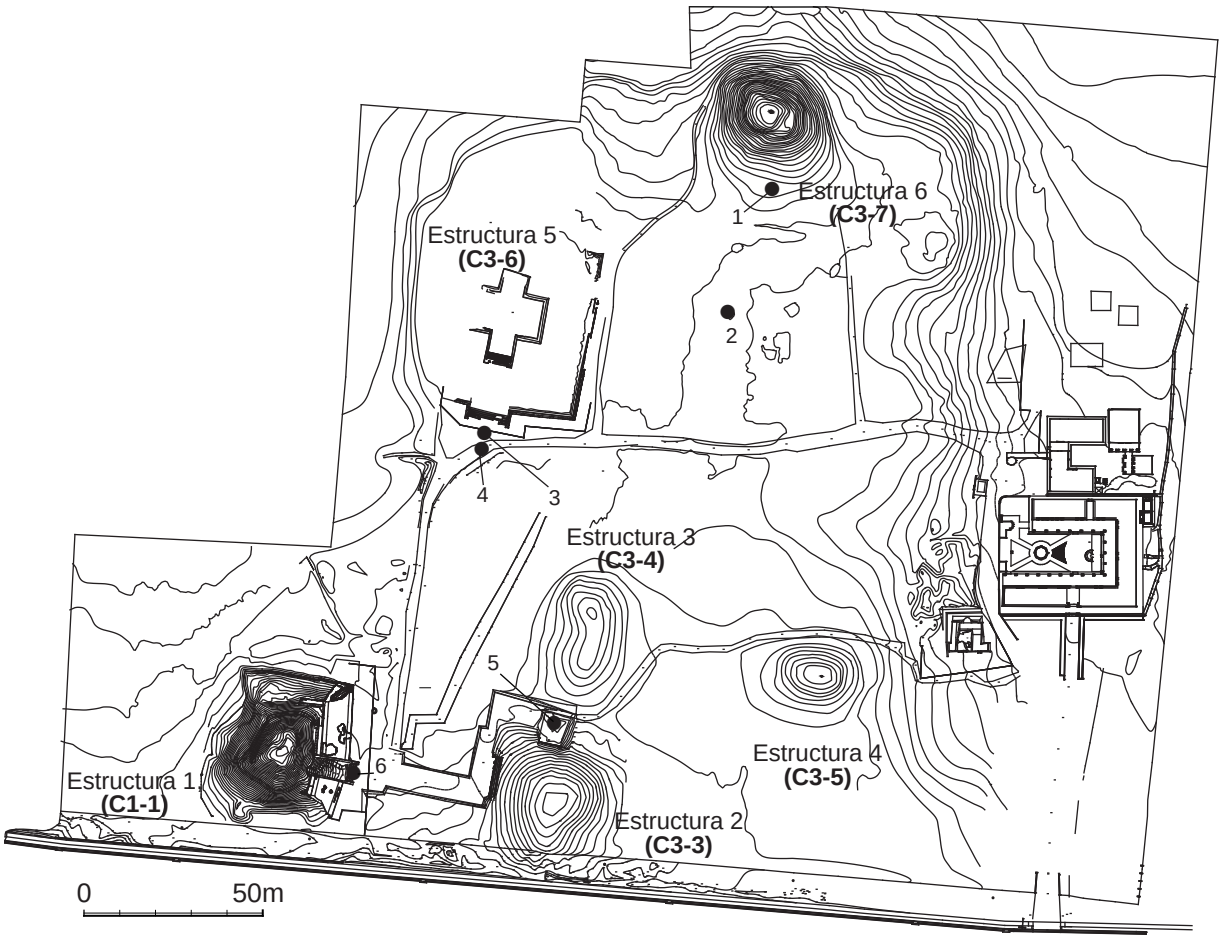


Figura 4 Monumentos en Casa Blanca y Tazumal
Casa Blanca: a, b, c; Tazumal: d (Shibata 2005)

inferior de esta escultura está trabajada con un disco a manera de espiga para sostenerla en la tierra. El monumento es zoomorfo, presenta dos ojos huecos; sobre las órbitas mantiene dos volutas mismas que corren del exterior al interior. En las fauces, se encuentra un objeto colgante sobre el labio inferior, el cual se divide por una acanaladura central en dos partes diferentes. El lado izquierdo solo tiene dos partes divididas simples, el derecho se dividen horizontalmente en tres partes y verticalmente en dos partes por la incisión. En total, presenta seis segmentos, cada segmento tiene una línea incisa en forma de "U"; la "U" en posición normal en los tres superiores e invertida en los tres inferiores. Se observa una protuberancia redonda en el segmento



1. Escultura con bajorrelieve (fig. 6b), 2. Pedestal (fig. 4a), 3. Estela Lisa y Cabeza de Jaguar Estilizado (Ichikawa 2009), 4. Altar Liso (Ibid.), 5. Estatua de dualidad (fig. 4c), 6. Cabeza de muerte (fig. 4b)

Figura 5 Localización de los monumentos en Casa Blanca

superior central. En las fauces hasta su nariz se encuentra una hendidura hacia arriba, mientras sobre la nariz una cresta en forma cuadrada alargada.

En la Extensión Este 1 de la Trinchera 1-2, se encontró una segunda Cabeza de Jaguar Estilizado (Cabeza 2), sembrada en el mismo piso (Figura 9b), como brotando de la tierra. Tiene dos ojos diferentes; el ojo derecho está hueco y el izquierdo normal. Sobre los ojos se encuentran las mismas volutas. De las fauces que se entrecorta hacia arriba hasta su nariz, se extiende un objeto, como una lengua larga que surge por debajo de las encías superiores sobre el labio inferior.

Con base en los contextos arqueológicos de ambas esculturas, se puede deducir que la ubicación de los Monumentos fue planificada antes de que se instalaran en el piso (Figura 8 y 9). Al construir el piso se colocaron las dos esculturas enterrándolas con el mismo material del piso.

En la Trinchera 1-1, se encontró un fragmento de escultura (Figura 8 y 6a) que se hallaba incrustada en el mismo piso en que se encontraron las Cabezas 1 y 2, con el lado esculpido hacia abajo. Es un fragmento de estela de estilo Izapa-Kaminaljuyú en bajorrelieve donde es posible observar una banda terrestre, en la cual se encuentra un símbolo de "U", semejante al fragmento encontrado en el Edificio Chay, de Kaminaljuyú presentando semejanzas en la técnica escultórica y diseño (Figura 6b; Shibata 1994). Sobre una base de petate o trono colocada en esta misma banda, se identifica a una persona sentada en sus rodillas. Esta escena es interpretada como un posible líder político o "señor".

En la superficie del lado Sur de la Estructura E3-1, se identificó otro fragmento de estela lisa (Figura 3f) sin ningún diseño.

g. Altar Liso Independiente

En la Trinchera 1-5 y su Extensión Oeste, se encontró un altar liso (Figura 8; Ito 2022b) que estaba incrustado en el piso. Es posible que para ponerlo se hubiera excavado un hoyo pequeño.

h. Fragmento de estela con la fecha de Cuenta Larga

En la Trinchera 8-1, se evidenciaron varias concentraciones de piedras en la parte superior de la capa de tierra café amarillenta

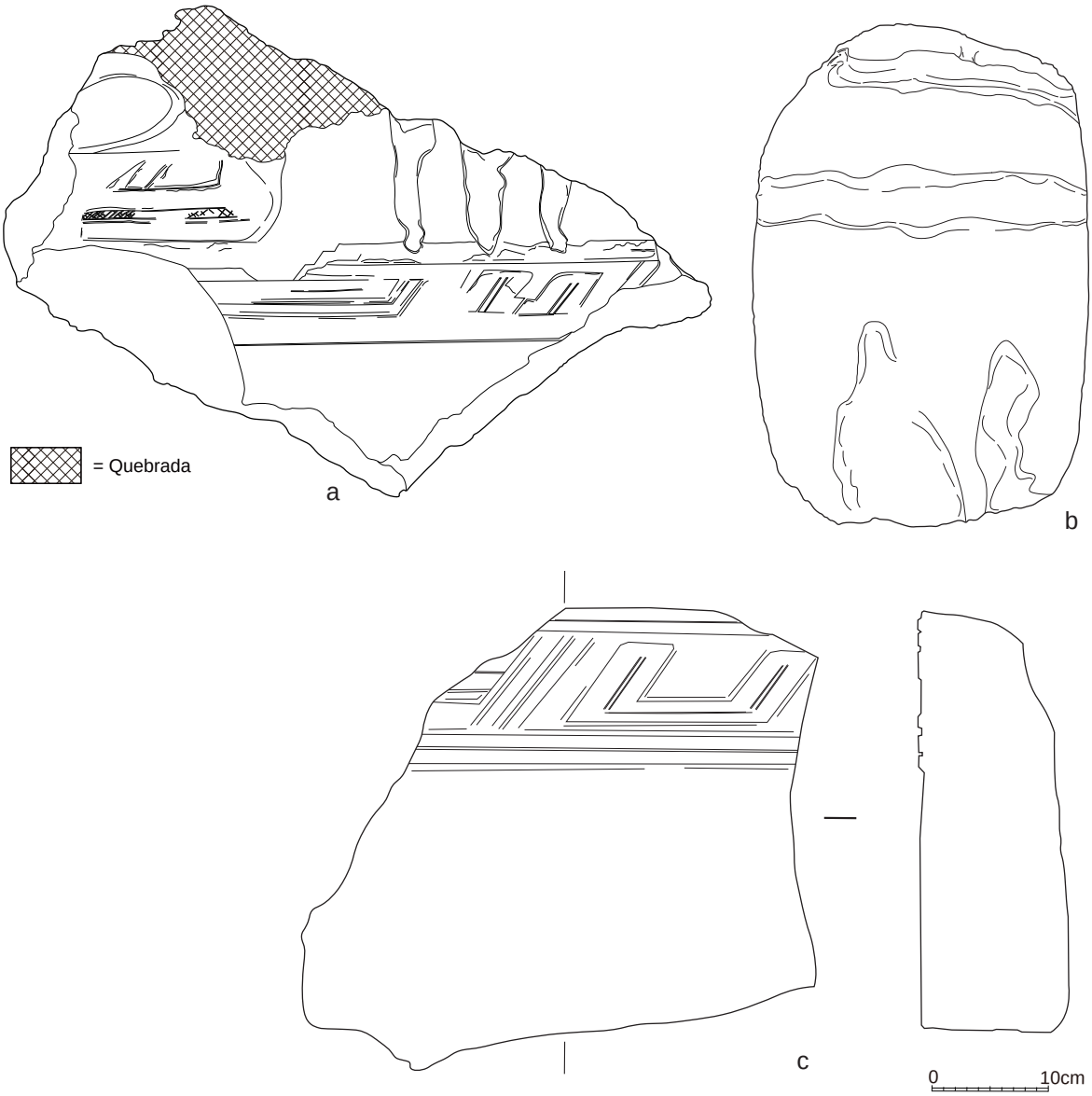


Figura 6 Estelas y escultura en Chalchuapa y estela esculpida en Kaminaljuyu
Chalchuapa: a, b (Dibujo en base de la foto por S. Shibata); Kaminaljuyu: c

(Figura 10). En una de estas concentraciones de piedras, se encontró un fragmento de estela que presenta una fecha de Cuenta Larga realizada con incisión fina, la cual puede interpretar como Bak'tun 7 (Figura 11 a y 12a, b; Ito 2020; Ito y Stuart 2019).

i. Tres monumentos lisos y un fragmento de escultura

En la Extensión Oeste 1 de la Trinchera 8-1, de entre una concentración de piedras, se halló una estela lisa con dos altares lisos (Figura 11). Un altar liso (Altar Este) se ubicó al Este de la estela lisa, mientras otro altar liso (Altar Oeste) al Oeste del mismo. Según el contexto arqueológico, la estela lisa se colocó acostada y el Altar Este sobre el piso (Piso 4; Figura 11d) para enterrarlos y construir otro piso encima (Piso 3). Cuando se terminó la función del piso (Piso 3), se excavó alrededor de la estela lisa y depositaron varias piedras con el Altar Oeste (Figura11c), debajo del cual se encontraron unas vasijas completas y semicompleta, las cuales se ofrendaron con el mismo altar liso. Posteriormente se construyó otro piso (Piso 2). Cuando se terminó este piso, se excavó y depositaron una cantidad de piedras con el fragmento de Cabeza de Jaguar Estilizado en posición invertida (Figura12b). Después se depositó cierta cantidad de tierra café clara para enterrarlos para sobreponer otro piso nuevo (Piso 1).

5. Jerarquía Religiosa a través de la Cabeza de Jaguar Estilizado

a ¿Jaguar o murciélago?

La Cabeza de Jaguar Estilizado fue nombrada así por Richardson (Richardson 1940), desde entonces se utiliza este término hasta la fecha (Demarest 1986; Longyear 1944; Sharer ed. 1978;

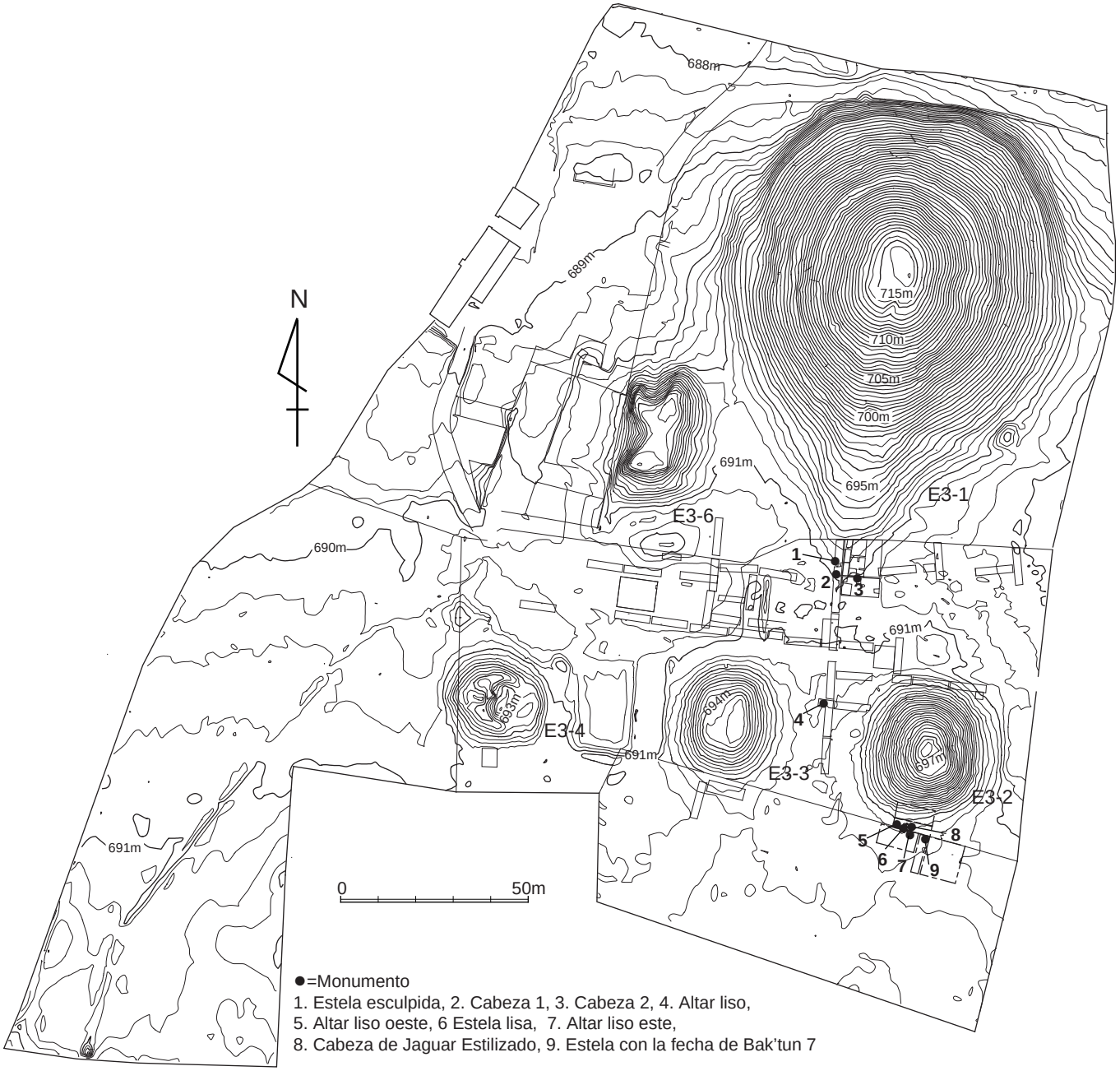


Figura 7 Monumentos in El Trapiche

Paredes U. 2012). Sin embargo, no se puede definir que se trate de un solo animal en este tipo de representación, ya que es la imagen simbólica estilizada de la fusión de dos animales o más. Por su parte, Federico Paredes cree que las fauces tienen forma de "cuadrifolio" (de cuatro lóbulos), asociado con cuevas, portales y transiciones (Paredes U. 2012). De hecho, la Cabeza de Jaguar Estilizado tiene solo una hendidura en la parte superior, con forma de trifolio (motivo con tres lóbulos). Será por tanto interesante estudiar qué representa este signo a través del método comparativo de varios ejemplares similares en Mesoamérica.

En Mesoamérica, la fauna que cohabitaba con las sociedades prehispánicas fue diversa y su importancia puede ser observada al contar con representaciones de animales en las obras prehispánicas. La práctica escultórica en Mesoamérica inició durante la época de los Olmecas. En la Cultura Olmeca el animal principal y mas poderoso era el felino, pero también se encuentran varias representaciones zoomorfas, como la serpiente, réptil, pájaro, mamíferos, entre otros. En Izapa se incrementó el número de anfibios y otros animales en la destreza escultórica, mientras que en Oaxaca dominaba la representación antropomorfa durante el Período Preclásico Tardío (Ito 1990).

En Oaxaca, el murciélago ocupó un lugar importante en las

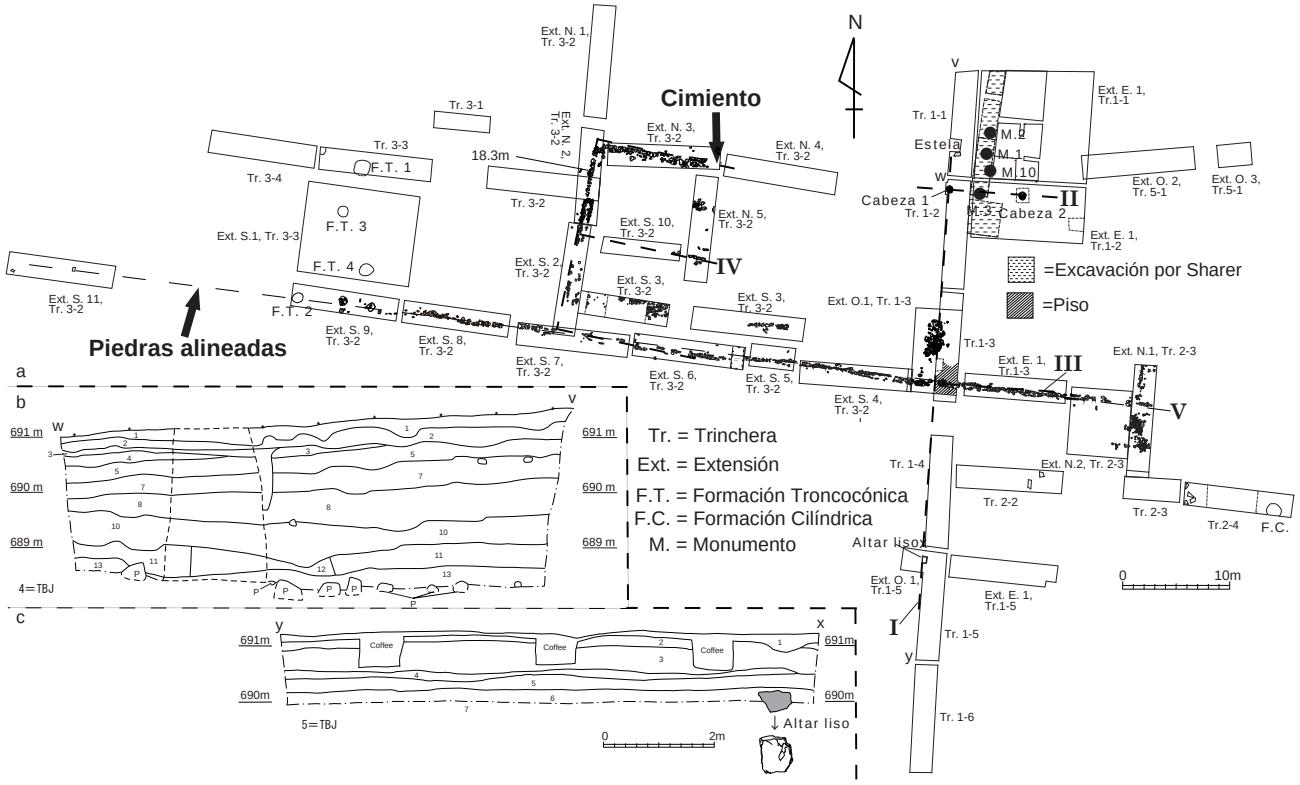


Figura 8 Monumentos con los contextos arqueológicos
a. Ubicación de piedras alineadas, concentración de piedras y formaciones troncocónica y cilíndrica, b. Corte oeste de Tr. 1-1, c. Plano del altar liso y corte norte de Extensión Oeste 1, Tr. 5-1

obras monumentales, mismos que se representan con una gran hoja nasal, la cual esta estilizada en forma cuadrada alargada (Eguiarte 2006; Muñoz Espinosa 2006; Romero S. 2013), mientras en Guatemala las mismas representaciones podrían describirse como muy naturalistas (e.g. en Tak'alik Ab'aj: Schieber de L. y Orrego C. 2010: Figura 7). En algunas representaciones oaxaqueñas relacionadas con el murciélago presentan una hendidura en la parte superior de las fauces (Eguiarte 2006; López Austin 1996). En la Cabeza de Jaguar Estilizado se encuentra una cresta nasal sobre sus fauces o nariz, la cual es cuadrada y alargada, de igual manera tienen una hendidura en la parte superior. Las fauces y la cresta de la Cabeza de Jaguar Estilizado podrían provenir de la representación de un murciélago (Ito 2017). También las volutas sobre los ojos podrían corresponder a orejas estilizadas de murciélago.

A propósito, según Romero Sandoval (2013):
"pudimos encontrar la combinación de 2 animales, el murciélago y el jaguar; esto se debe, en parte, a que ambos seres son hábitos nocturnos, viven en el inframundo y tienen la facultad de ejecutar sacrificios cruentos. ⋯ al atacar a sus víctimas, los despedazan, tal como hacen los felinos con sus presas, y extraen la sangre, como lo hacen los vampiros con mamíferos".

Por tal razón, es difícil definir o establecer límites de representación de alguno de los dos seres, jaguar o murciélago para las esculturas conocidas como: "Cabezas de Jaguar Estilizado".

En Mesoamérica, es común contar o encontrar ejemplos de combinaciones de varios animales en el arte prehispánico. Es necesario determinar cada elemento facial para una parte estilizada, comparando los ejemplares similares en Mesoamérica detalladamente con contexto arqueológico, para poder reconocer el significado de cada elemento. De igual forma, se debe analizar el contexto arqueológico de las Cabezas de Jaguar Estilizado para interpretar sus características plasmadas a manera de monumento escultórico.

b. Contexto arqueológico de Cabeza de Jaguar Estilizado en El Trapiche

Hasta la fecha, se han encontrado 4 Cabezas de Jaguar Estilizado en El Trapiche. Frente a la fachada o en el lado sur de la estructura E3-1, se colocaron las tres Cabezas de Jaguar Estilizado, alineadas a 90° grados con el eje central (Norte-Sur) de la Estructura E3-1 (Figura 8a: I, II).

Según la estratigrafía de excavación, al construir un piso nuevo se habrían colocado las 2 Cabezas de Jaguar Estilizado, incrustándolas en el piso nuevo. Al norte o arriba de las esculturas, se ubica el acceso a la Estructura E3-1. El lado este (exterior) de la Cabeza 2, al amanecer recibiría el sol más temprano,

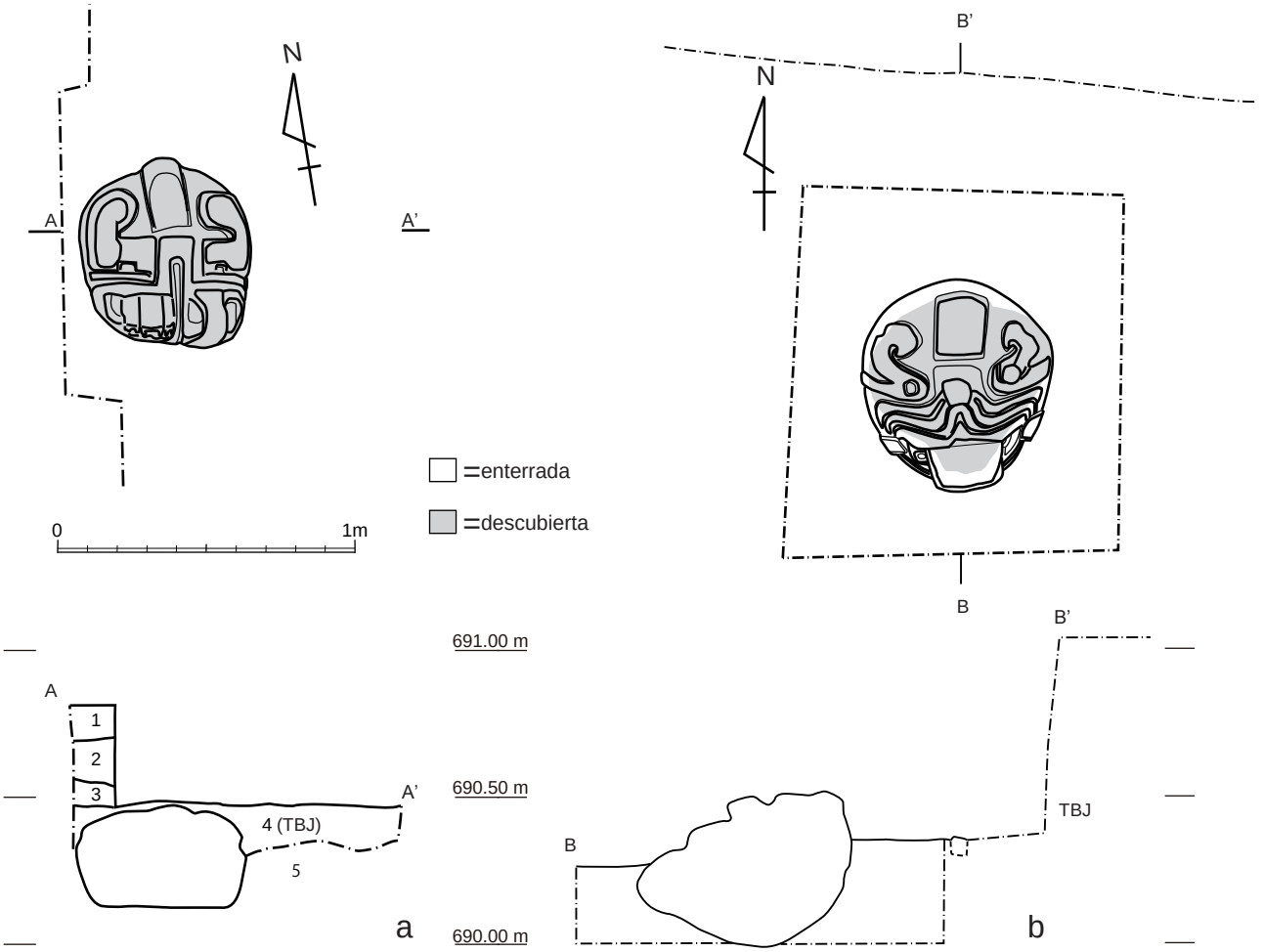


Figura 9 Contexto arqueológico de las Cabeza de Jaguar Estilizado
a. Cabeza 1, b. Cabeza 2

mientras el ojo oeste (exterior) de la Cabeza 1 observaría el sol poniente hasta el último momento de la puesta del sol. Los ojos interiores de las dos esculturas estarían vigilando o guardando el acceso interior a la Estructura E3-1. La orientación de los dos Monumentos estaría hacia el Norte o la cima de la Estructura E3-1.

c. Dualidad en la Cabeza de Jaguar Estilizado

En las tierras altas de Guatemala, los Mam tienen una cosmología vinculada al sol (Watanabe 1983):

"*Okni* 'east' comes from the verb *ook* 'enter'; *elni* 'west' is derived from *eel* 'go out'; *jawni* 'north' comes from *jaaw* 'go up'; and *kubni* 'south' is related to *kub* 'go down'"

En los Altos de Guatemala, se cree que el sol sube hacia el cielo en el Este, teniendo vida y sale del cielo en el Oeste, para ir a otro mundo, concepto que se aplica en el caso de El Trapiche. El ojo más cerca del Este tiene vida y el extremo poniente está hueco, como muerto (luz que se apaga) para viajar a otro mundo. Como en Mam el Norte significa arriba y Sur para bajo, al norte (arriba) de las dos Cabezas está localizada la Estructura E3-1, la cual fue la única estructura grande construida por primera vez en la fase Colos. En la fase Caynac, se instaura una entidad política que proyecta en el paisaje religioso la cosmogonía propia de los chalchuapanecos, a través de Cabeza de Jaguar Estilizado.

Considerando el posible significado de dichas esculturas zoomorfas, es factible distinguir una dualidad expresiva antagónica en los lados derechos e izquierdos, también los lados superiores e inferiores. Los lados exteriores de los dos Monumentos están relacionados con el sol, mientras los lados interiores con el templo. Por esta razón, el ojo este de la Cabeza 2 está vivo, como nace el sol en el Este del inframundo . Y el ojo oeste de la Cabeza 1 está hueco, como muerto sin luz. El ojo derecho de la Cabeza 2 y el izquierdo de la Cabeza 1 están vinculados al acceso a la cima de la estructura, con los ojos muertos para la entrada al otro mundo.

Las fauces de los dos monumentos pueden estar simbolizando la boca del mundo infrahumano. La mitad oriente de la Cabeza 2 y la poniente de la Cabeza 1 estarían relacionadas con la actividad solar. Así también la mitad este de la Cabeza 1 está

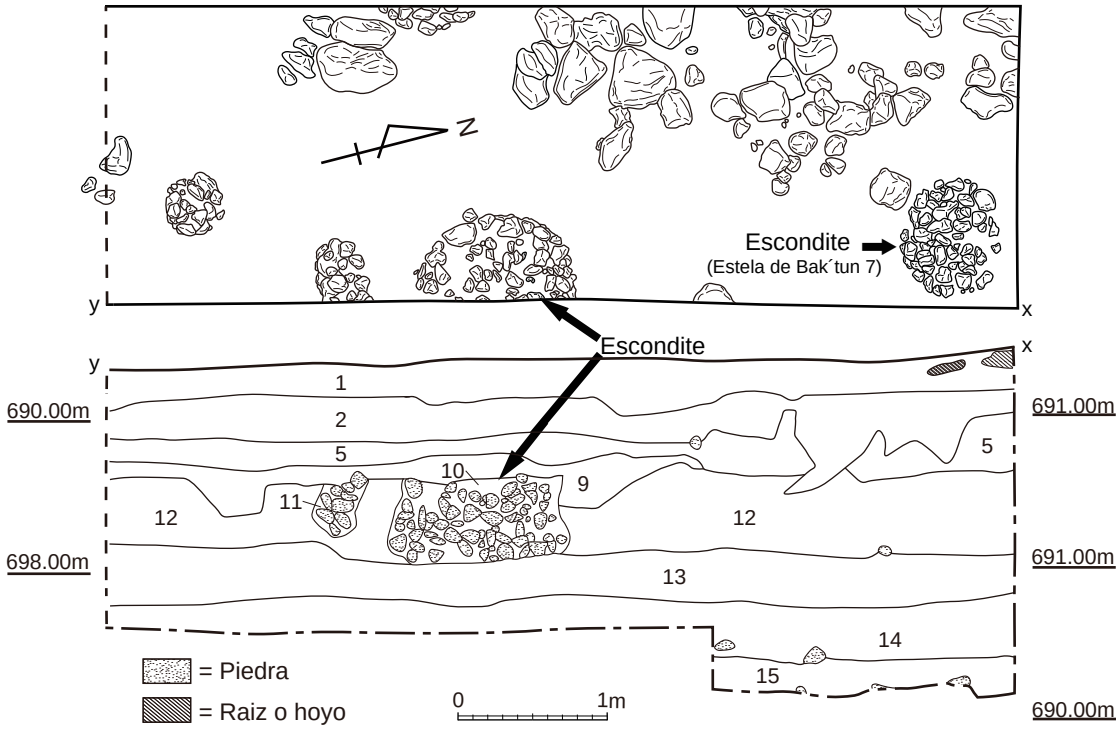


Figura 10 Concentraciones de piedras (escondites) en Trinchera 8-1
a. Plano, b. Corte este

destinada al inframundo a través del templo. Sin embargo, la salida para tener vida podría ser única en el Este, donde sale el sol. De hecho, el Monumento 3 está puesto entre las Cabezas 1 y 2 (Figura 8), el cual solo tiene la parte superior con un ojo vivo en el Este y otro muerto en el Oeste. De esta forma, la ubicación posiblemente simboliza entrada y salida del otro mundo para ser ofrendada ante el templo con los ojos correspondientes a los puntos cardinales.

d. Una hipótesis sobre la función y significado de la "Cabeza de Jaguar Estilizado"

Cuando se camina en el acceso a la Estructura E3-1, se pueden apreciar los ojos huecos de ambas cabezas, siendo el ojo izquierdo de la Cabeza 1 y el derecho de la 2. Estos ojos huecos vigilan el acceso al inframundo, representado posiblemente por el templo de la Estructura E3-1.

Con base en la interpretación mencionada arriba, se presenta una hipótesis sobre la función de la "Cabeza de Jaguar Estilizado".

① Se vincula con el rito de mandar a los muertos y las cosas matadas hacia el inframundo.

② Se celebra la actividad solar, ubicándola en los puntos cardinales.

③ El ojo lleno o vivo está relacionado con el nacimiento del sol o de la vida.

④ El ojo hueco o muerto indica hacia el inframundo.

⑤ Tienen una función conductora vinculante entre el inframundo y el cosmos (cielo), como "Guardianes" del orden del cosmos.

⑥ Las fauces es la entrada-salida del inframundo

e. Cabezas de Jaguar Estilizado en la Costa Sur de Mesoamérica

En la Costa Sur de Mesoamérica, se encuentran más de 50 esculturas con este estilo escultórico "Cabeza de Jaguar Estilizado" (Paredes U. 2012).

Con base en la hipótesis presentada, en este estudio se clasificaron las "Cabezas de Jaguar Estilizado" a través de sus atributos. Según las características de los ojos y las fauces, se pueden clasificar en cinco grupos, como Un Ojo Vivo, Un Ojo Quebrado, Fauces Partidas, Simple y Sin Ojos. Se intentará explicar los grupos correspondientes según la jerarquía religiosa de los atributos representados:

① Grupo 1: Un Ojo Vivo

El Grupo 1 consiste de 6 cabezas. Tiene un ojo vivo y otro hueco. Se encontraron en Ahuachapán, Coatepeque, Las Cruces y Chalchuapa. 2 cabezas de Chalchuapa están quebradas. Las cabezas con un ojo vivo, podrían estar simbolizando vida y muerte a través de un ritual de mandar la muerte y de recibir la vida nueva del sol naciente. Sin embargo, en las fauces de 2

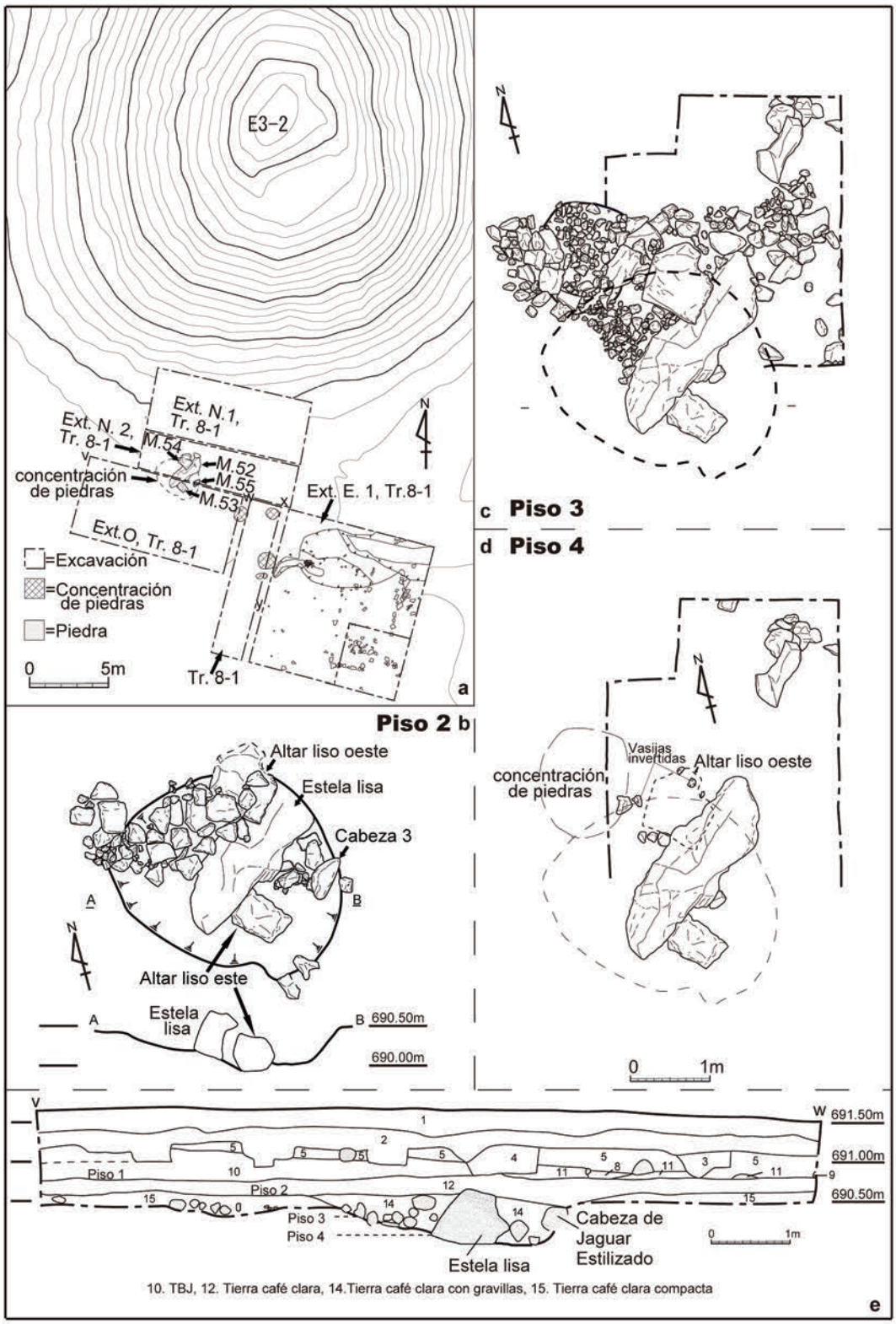


Figura 11 Excavación en la Extensión Oeste1, Tr. 8-1
a. Monumentos y concentraciones de piedras, b. Plano y elevación al nivel de Piso 2, c. Plano al del Piso 3, d. Plano al del Piso 4, e. Corte norte en la Extensión 1, Tr. 8-1

cabezas se encuentran variaciones, las cuales podrían deberse a alguna alteración ritual. La cabeza con el ojo derecho lleno podría haber estado puesto con el ojo vivo en el este, mientras otro hueco en el oeste.

② Grupo 2: Un Ojo Quebrado

Se encuentran 3 cabezas que tienen ojo izquierdo quebrado o

raspado y otro hueco. En la parte del ojo izquierdo de M 11 (número de la Cabeza de Jaguar Estilizado establecido por Paredes U. 2012), está muy liso, como si hubiese sido raspado el ojo. Los ojos izquierdos de M 6 y M 40 están quebrados. Existe la probabilidad de que se hubiera matado el ojo vivo izquierdo para que no sirviera para renovar o crear la otra vida, lo cual indicaría que hubiera perdido cierto poder religioso en cierto grado. Se localizaron en Ataco y Ahuachapán a excepción de una cabeza con la proveniencia desconocida.

③ Grupo 3: Fauces Partidas

Los Grupos 3 y 4 tienen solo ojos huecos, sin embargo, existen diferencias entre los dos grupos en las fauces. El Grupo 3 tiene las partes derecha e izquierda distintas en el objeto saliente de las fauces, la cual tendría la función de mandar el muerto y la cosa matada al inframundo, posiblemente por dos rumbos del punto cardinal del oeste y del templo. Se localizaron 10 cabezas en los sitios de Ataco, Izalco, Ahuachapán, Hda. San Francisco, Guaymango, El Refugio y Chalchuapa, y una cabeza de la que no se sabe su procedencia.

④ Grupo 4: Simple

Este grupo se caracteriza por tener los ojos huecos. El objeto saliente de las fauces es como una sola lengua. Se encuentran 42 cabezas correspondientes a este grupo "Simple" y distribuye por toda la región del Occidente de El Salvador, representación que tendría la función de mandar a los muertos y los objetos matados al más allá.

⑤ Grupo 5: Sin Ojos

Este grupo consiste de 4 cabezas. No se pueden identificar los ojos correspondientes, ya que la cabeza está muy estilizada. En Casa Blanca, Chalchuapa, estaba acompañando a la estela lisa y altar liso (Ichikawa 2007). Es posible que este grupo podría tener función auxiliar para ayudar el rito principal. Se encuentran en Santa Leticia, Chalchuapa y Ataco.

f. Jerarquía Religiosa a través de la escultura monumental

A través de la Cabeza de Jaguar Estilizado, presuntamente se impartió una ideología orientada hacia el convencimiento de la existencia del inframundo, ya que no hay ninguna cabeza que tiene dos ojos vivos. El Grupo 1 tiene más funciones que otros grupos, como crear la vida y/o el sol nuevo. En este sentido, se puede inferir la existencia de dos tipos de ritos religiosos, como mandar al muerto y renovar la vida. El Grupo 2 tienen un ojo raspado o quebrado en el lado izquierdo, el cual podría haber estado vivo antes de la destrucción. Solo tendría la función de mandar al muerto. El Grupo 3 tiene las fauces divididas en dos partes, izquierda y derecha, por lo cual podría mandarlo por dos rumbos. El Grupo 4 funcionaba para el rito de los muertos y objetos quebrados para mandarlos solo por un rumbo, al inframundo. El Grupo 5 es el más estilizado que otros grupos y muy probable solo jugaba un papel auxiliar a otro rito principal.

A través de la función del grupo de monumentos, es probable la existencia de una jerarquía religiosa en el Occidente de El Salvador. El rango superior correspondería al Grupo 1, ya que se puede realizar un rito más complejo. Sin embargo, el Grupo 2 podría haber sido del primer rango, como el Grupo 1, ya que es posible que se hubiera quebrado o raspado el ojo vivo, por lo cual perdería su función. El segundo rango puede ser el grupo 3, que podría tener dos tipos de rito. El tercero es el Grupo 4, que solo puede manejar un solo tipo de rito. El Grupo 5, podría estar fuera de este rango, ya que tiene función auxiliar para el rito principal.

Se infiere la existencia de una jerarquía religiosa que posiblemente administraba la sociedad compleja del Preclásico Tardío en el Occidente de El Salvador. En este caso, Chalchuapa podría haber sido la capital de una sociedad que poseía un pensamiento de creencias abstractas complejas que se ven reflejadas en sus representaciones escultóricas, ya que tenía la mayoría del Grupo 1 con una de Grupo 3. También se manejaba un sistema de gerencia religiosa que aplicaba ritos de vida y muerte con las Cabezas 1 y 2 frente a la Estructura E3-1.

Cronológicamente, el uso de ritos con la Cabeza de Jaguar Estilizado posiblemente iniciaría en el período Preclásico Medio, ya que se encontró una cabeza del Grupo 4 con los materiales de la fase Colos en Tapalshucut, el cual sería manejando al pueblo a través de chamanismo, como cree Paredes (2012). En el período Preclásico Tardío, se fundaría un sistema de creencias religiosas en El Trapiche, instalando prácticas rituales de muerte y vida frente a la Estructura E3-1 con una Cabeza de Jaguar Estilizado del Grupo 1 y otra de Grupo 3. Resulta probable entonces que la instauración de rituales tan intensos en Chalchuapa le otorgaría supremacía con relación a sitios cómo Ataco y otros, quitándoles el poder de intermediación entre lo profano y lo sagrado, es decir, de crear la vida al quebrar o raspar un ojo vivo de la Cabeza de Jaguar Estilizado (Grupo 2), por lo que quedarían sometidos a Chalchuapa, entidad política que les habría sólo dado autorización de realizar únicamente el rito de mandar la muerte, monopolizando el derecho de recrear la vida con la escultura del Grupo 1. Este sistema pudo haber funcionado hasta el Clásico Temprano que se evidencia al no existir ninguna sedimentación que cubriera las Cabezas 1 y 2 debajo de la ceniza volcánica del Ilopango (Figura 8). Posiblemente fue hasta la erupción gigante del volcán Ilopango en el siglo 5 (Smith et al. 2020), que se habría llevado a cabo el rito dual de vida y muerte. También

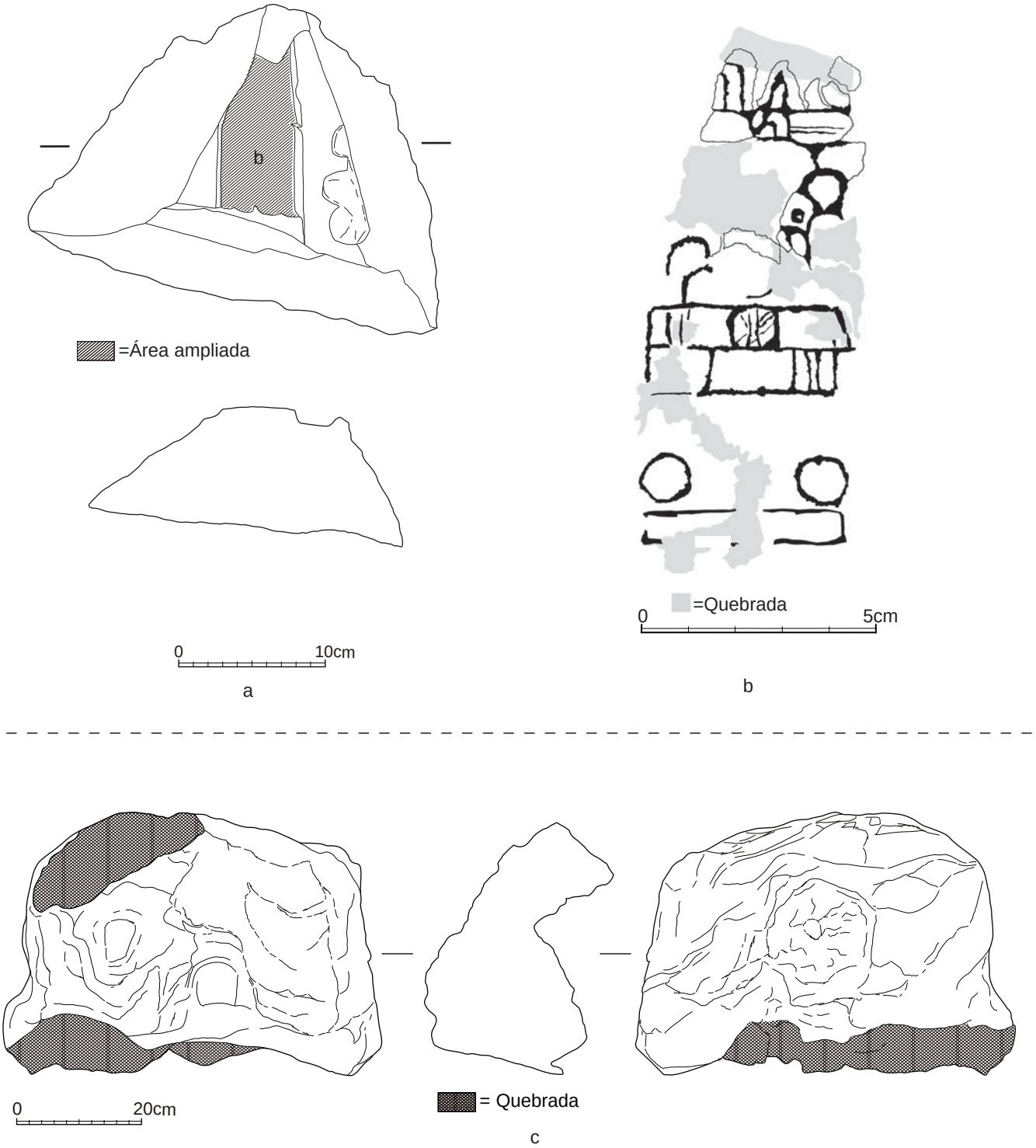


Figura 12 Estela y Cabeza de Jaguar Estilizado (Cabeza 3)
a. Plano y corte de la estela, b. Detalle de la parte de los glifos, c. Plano y corte de la Cabeza 3

el rito relacionado a esta escultura duró, por lo menos, hasta el Clásico Tardío, ya que se encontró el Monumento 22 al lado sur de la Estructura B1-1 en Tazumal, aunque existe la posibilidad de haber sido modificada la forma escultórica del monumento, ajustándola al rito del Clásico Tardío. Por esta razón, la Cabeza de Jaguar Estilizado que tiene espiga larga horizontal (e.g. Paredes U. 2012: M 12), podría pertenecer al período Clásico Tardío ya que esta forma escultórica de espiga en San Andrés se encuentra durante el período Clásico Tardío (Ito 1999). También en el sitio Cara Sucia, se encuentra un disco zoomorfo que tiene dos ojos vivos y colmillos sin cresta sagital, es decir, existen variantes iconográficas (Boggs 1975; Richardson 1940). En Chalch-

uapa, el Monumento 22 muestra una diferencia a otras Cabezas de Jaguar Estilizado pues la escultura con el diseño de volutas que podrían estar representando las cejas unidas de la Cabeza del Jaguar Estilizado (Figura 3a), podría estar indicando un cambio o alguna variante del sistema de creencias en Tazumal durante el período Clásico Tardío.

6. Fragmento de estela relacionada al Bak'tun 7

a. Contexto arqueológico del fragmento de estela

Se identificó un fragmento de estela en una de las concentraciones de piedras frente al Montículo E3-2, fuera de su eje arquitectónico, con una fecha de Bak'tun 7 (Figuras 10, 11 y 12a, b). Por el contexto arqueológico, es posible deducir la secuencia de colocación del fragmento de estela en el siguiente orden (Ito y Stuart 2019):

① Se excavó una concavidad en el piso original.
② Se rellenó la concavidad con piedras al cierto nivel.
③ Se colocó el fragmento de estela con el lado inscrito o esculpido hacia arriba.
④ Se cubrió la estela y la concavidad con piedras.
⑤ Se hizo un piso con arena compactada sobre la concavidad.

Existe una diferencia en la colocación de estela en Chalchuapa. Monumento 1 y otro fragmento se encontraron puestos en el piso y colocado sobre el eje arquitectónico de la Estructura E3-1, mientras el dicho fragmento se encontró en una concavidad rellena con piedras fuera del eje arquitectónico de la Estructura E3-2. Es posible que para Monumento 1 y otro fragmento fueron dedicados como ofrenda a la Estructura E3-1, mientras el fragmento con la fecha de Bak'tun 7 se interpreta como una ofrenda al inframundo, haciendo una concavidad para cumplir su objetivo.

b. Estelas con glifos y la fecha más temprana en Mesoamérica y Chalchuapa

En la Costa Sur de Mesoamérica, se encuentran registradas más de 300 estelas, en la mayoría de las cuales no se conoce el contexto arqueológico a través de la investigación científica (Ito 2004b). Solo una docena de estelas se encontraron dentro de un contexto arqueológico (*in situ*) del período Preclásico. Correspondiente a ese mismo periodo, en Chiapas, México, se localizan 5 sitios arqueológicos como Tzutzuculi, Izapa, Mirador, Chiapa de Corzo y Padre Piedra. En Guatemala se registran estelas esculpidas en 6 sitios arqueológicos, como Tak'alik Ab'aj, El Baul, Nueve Cerros, Los Mángales, El Portón y Kaminaljuyu; y en El Salvador, solo se han identificado 2 sitios: Ataco y Chalchuapa (Figura 1). Entre las estelas esculpidas de los sitios mencionados, se reduce el número de estelas que presentan glifos en su inscripción. En este sentido se puede inferir que los sitios que presentan un sistema de escritura pueden ser entidades políticas que mantienen un nivel cultural avanzado y poseedores de un alto nivel tecnológico en la región, como Izapa, Chiapa de Corzo, Tak'alik Ab'aj, El Portón, Kaminaljuyu y Chalchuapa.

No obstante, en la Costa Sur de Mesoamérica se encuentran 3 sitios que tienen esculturas con las fechas más tempranas de Bak'tun 7, como Chiapa de Corzo, El Baúl y Chalchuapa, mientras fuera de esta región solo existe 1 sitio, Tres Zapotes en Golfo de México (Ito 2021; Ito ed. 2021; Ito et al. 2020; Ito y Stuart 2019; Schieber de L. y Orrego C. 2013). Los pobladores de estas entidades políticas conocían y manejaban el sistema calendárico de Cuenta Larga en la región, por lo que es factible proponerlos como entidades políticas de alto rango.

De hecho, en El Trapiche se encontraron varios fragmentos de estelas al frente de la estructura E3-1, destacando dos fragmentos de estela vinculados a las Cabezas 1 y 2. El Monumento 1 está esculpido en ocho columnas dispuestas para el grabado de glifos y un personaje asociado (Sharer ed. 1978). El fragmento encontrado por la Universidad de Nagoya es un fragmento de estela de estilo Izapa-Kaminaljuyú (Ito ed. 2014). Más hacia el sur de la Estructura E3-1, frente a la Estructura E3-2, se encontró el dicho fragmento (Figura 11) con fecha de calendario de Cuenta Larga relacionada al Bak'tun 7.

En el lado esculpido del fragmento se presentan el glifo introductor de la serie inicial (GISI) y el número 7 para Bak'tun en la una columna por incisión fina (Figura 12 a, b). No obstante, en la parte superior del GISI, se identifica una unidad doble triangular o cuadrada en el centro, así también se observan dos elementos o unidades que salen hacia fuera en forma de "L" invertida con una curva erguida en el extremo exterior. Debajo de la unidad triangular, se encuentra un nudo con cordón doblado en los extremos. Más hacia abajo, se encuentra un posible rostro mostrando su perfil izquierdo. Solo es posible identificar la parte bucal, así como también una oreja y la parte trasera de la cabeza por un arco inciso. En la parte de la oreja, es posible registrar la presencia de un anillo, el cual podría tener una voluta añadida arriba y otra abajo. En la parte inferior del glifo, ocupan un par de bandas. La banda superior posee un círculo en el centro, el cual está dividido por un par de líneas paralelas verticales con líneas incisas en rejillas diagonales por toda la parte del mismo círculo. En los dos extremos posiblemente se encuentran varias líneas verticales. En la banda inferior, posiblemente tiene cada 4 líneas verticales en los extremos derecho e izquierdo.

En la parte inferior del glifo de la Estela C de Tres Zapotes, tiene una cara zoomorfa de perfil izquierdo, debajo de la cual se

encuentran tres barras adosadas horizontalmente. Sin embargo, el GISI de la Estela 1 de El Baúl es muy diferente a los anteriores. En el caso de la Estela 2 de Tak'alik Ab'aj , aun de Bak'tun 8, la parte inferior del mismo glifo posee una forma cuadrada con las esquinas redondeadas, en la cual se encuentran dos unidades cuadradas sobre la línea horizontal que divide el glifo en dos partes, inferior y superior. Pero no tiene ningún rostro de perfil. El glifo identificado en el dicho fragmento de estela tiene más semejanza al de Tres Zapotes que él de Tak'alik Ab'aj (Bak'tun 8) por el perfil de rostro, aunque el rostro de perfil de Chalchuapa no está completo debido al deterioro.

c. Técnica escultórica entre las estelas de Bak'tun 7 en Costa Sur de Mesoamérica

En la Costa Sur de Mesoamérica, se pueden observar las técnicas escultóricas de incisión y bajorrelieve en unas esculturas de Kaminaljuyu, Izapa, Chiapa de Corzo, Tak'alik Ab'aj y El Portón para esculpir los glifos y números (Norman 1976; Lee 1969; Sharer y Sedat 1987).

En el fragmento de estela encontrado en El Trapiche se observa una parte elevada formando una columna en bajorrelieve, como en el Monumento 1, en la cual se ven los tres lados planos pulidos (Figura 12a). Sobre la misma columna, se aplicó una incisión fina para presentar la fecha de Bak'tun 7. En la parte plana al lado derecho de la columna se encuentra un bajorrelieve con un diseño geométrico o volutas. La mayoría del dicho fragmento posee bajorrelieve.

En Estela C de Tres Zapotes, se realizó un bajorrelieve para presentar el número y el glifo, definiendo la columna. En la Estela 1 de El Baúl se hizo una columna con el glifo introductorio y el número en bajorrelieve. Sin embargo, en la Estela 2 de Chiapa de Corzo, se observan los números y glifo incisos sin columna, como el dicho fragmento de Chalchuapa.

d. Técnica escultórica en Chalchuapa

En Chalchuapa se aprovecharon dos técnicas escultóricas, tanto el bajorrelieve como la incisión. A veces se combinaron las dos técnicas, de las cuales se utilizó la incisión para presentar los detalles sobre el bajorrelieve en los dos monumentos de Chalchuapa (Figura 8; Ito, ed. 2014; Ito y Stuart 2019; Sharer, ed. 1978).

7. Discusión: Esculturas y Estructuras en el paisaje urbano de Chalchuapa y Kaminaljuyu en el periodo Preclásico.

Cronológicamente en Chalchuapa y Kaminaljuyu durante el Período Preclásico Temprano, como en la fase Tok (Chalchuapa) y Arevalo (Kaminaljuyu), no se han registrado esculturas ni estructuras monumentales en ese momento, solo los materiales arqueológicos (e.g. Arroyo et al. 2020; Fukaya y Ito 2017; Inomata y Henderson 2016; Inomata et al. 2014; Ito 2000a, 2001a; Ito ed. 2021; Minami et al. 2000; Parsons 1986; Sharer ed.1978).

Para el Período Preclásico Medio, en Chalchuapa se encuentran esculturas y estructuras arquitectónicas. En El Trapiche, durante la fase Colos se construyó una estructura grande hecha de barro con una altura de más de 20m, conocida como Estructura E3-1-2nd (Sharer ed. 1978). El Monumento 7, que se encontró en las gradas del acceso de la Estructura E3-1-2nd, representa a un gordinflón o barrigón con pedestal poco trabajado. Es posible que esté monumento se hubiera puesto al pie de las grada. El Monumento 12 y la estatua en posición sedente podrían pertenecer al Período Preclásico Medio a través de su estilo escultórico Olmeca.

En Kaminaljuyu, se encuentran varias estructuras hechas en barro del periodo Preclásico Medio (Ito 2000a, 2001c), y también varias esculturas monumentales (Borhegyi 1972; Ito 1994). En el área de Mongoy (B-1-1) durante Kaminaljuyu II (Fase Providencia) se construyó el "Edificio Quemado" (Ohi ed. 1994). Entre las fases Las Charcas y la Providencia hay una estela esculpida de estilo de los Danzantes, como la Estela 9, en la Estructura C-III-6 con los Pedestales (Parsons 1986; Shook 1951). Entre los pedestales en Kaminaljuyu, se encuentra una figura antropomorfa o zoomorfa montada en el mesa-altar con base tetrápode, como la escultura con pedestal y trono tetrápode de Chalchuapa (Figura 4a; Ito 1998, 2022). En el Pedestal 7, Kaminaljuyu, se encuentra una incisión en forma redonda debajo del altar con base tetrápode, el cual podría identificarse como un nicho, como el de los Mesa-Altar de los Olmecas (Ito 1998, 2022: fig. 5c). En la Costa Sur de Mesoamérica, se dividió el trono olmeca del golfo de México en dos partes: la parte superior, como mesa-altar con base tetrápode y la inferior, como escultura de nicho (e.g. Monumento 2 de Izapa; Ito 2006, 2022).

En Kaminaljuyu y Chalchuapa, durante las fases Providencia y Colos-Kal-Chul se encuentra la cerámica café con motivos incisos, sin engobe y blanca con pintura roja y café rojizo, basado en los datos por las investigaciones que hemos realizado (Ito ed. 2010; Ohi et al. 1994). La forma de cerámica con reborde en forma de festón y con pestaña se encuentra en Kaminaljuyu con más frecuencia que en Chalchuapa. La decoración negativa (Usulután) tiene diferencia entre dos sitios, en Kaminaljuyu un diseño (Ohi et al. 1994: Figura 5-4) y en Chalchuapa con líneas paralelas o manchas (Ito ed. 2010: Figuras 24, 28). Kaminaljuyu y Chalchuapa tienen cierta semejanza con diferencias.

Durante el Período Preclásico Tardío, en Chalchuapa al sur de la Estructura E3-1 se pusieron las piedras alineadas en el piso de tierra compactada con el mismo eje arquitectónico (Figura 8)

entre las fases de Kal, Chul y Caynac, sobre el cual más hacia el Sur se colocó un altar liso. En la fase Caynac se enterraron todas las piedras alineadas para otro piso en que se instalaron las Cabezas de Jaguar Estilizado (Figura 9). Es muy probable que al construir un piso nuevo el dicho altar liso sirvió como marcador arquitectónico para planificar la instalación de las Cabezas, ya que el eje arquitectónico del dicho altar (Figura 8a: I) pasa a la Cabeza 1 con la misma orientación del eje arquitectónico de la Estructura E3-1. De hecho, la línea entre las Cabezas (Figura 8: II) hace ángulo recto con la que pasa sobre el dicho altar liso (Figura 8: I), cruzando la de las piedras alineadas (Figura 8: III) en la Trinchera 1-3. En el periodo contemporáneo con las piedras alineadas, se encontró un cimiento de piedras (18×10+α m) con una orientación un poco diferente a otras (Figura 8: IV), faltando la parte oriente, unos veinte metros al oeste del cual se encontraron cuatro formaciones troncocónicas. Con el nuevo piso, la Estructura E3-1 se agrandó hasta una altura de 25m aproximadamente (E3-1-1st). Hacia el sur de la misma estructura se construyeron las Estructuras E3-2, E3-3, E3-4 y E3-6 en el periodo de Preclásico Tardío (Ito ed. 2014, 2021; Sharer ed. 1978). También en el área de Casa Blanca, se construyó la "Gran Plataforma" con una extensión de 220×240m, sobre la cual se construyeron varias estructuras, como la Estructura 1 (C1-1), 3 (C3-4), 5(C3-6) entre otras (Ito ed. 2010; Ito et al. 2003; Shibata et al. 2002). Drásticamente en Chalchuapa se creó un paisaje urbano más amplio hasta la fase Caynac desde El Trapiche hasta Casa Blanca, de hecho, al cubrir las estructuras bajas anteriores.
En El Trapiche, delante de la Estructura E3-1, se encontraron varias esculturas, como Cabeza de Jaguar Estilizado, Estela Esculpida y los Monumentos Lisos y al sur de la Estructura E3-2, Estela Esculpida y los Monumentos Lisos. En Casa Blanca, se encontraron dos Monumentos lisos y una Cabeza de Jaguar Estilizada en el frente de la Estructura 5 (C3-6) sobre el eje arquitectónico (Ichikawa 2007). Es posible que se puso la Escultura 2 frente sur a la Estructura 2 (C3-3) en el periodo Preclásico Tardío (Ito 2000b). En La Cuchilla se encontró un fragmento de escultura en el estrato de Preclásico Tardío (Ichikawa y Shibata 2008).

En Kaminaljuyu, durante Kaminaljuyu III (Fase Verbena-Arenal), se construyeron varias estructuras hechas de barro (Ito 2000a, 2001a). En el Montículo B-1-1 (Mongoy) se construyó un basamento piramidal ("Gran Basamento"), cubriendo el "Edificio Quemado" (Ohi y Ito 1994a, b, c). Y en el edificio de Chay (D-III-1), se encontró la subestructura IV con el mismo sistema constructivo de "Gran Basamento" (B-1-1), sobre la cual se colocó un fragmento de estela esculpida (Figura 6c; Shibata 1994), con la misma técnica escultórica que tiene el fragmento de estela encontrado en El Trapiche (Figura 6a). En Kaminaljuyu aumentó variedad de esculturas, como estela esculpida, altar zoomorfo, de silueta, entre otras (Ito 1998, 1999, 2002, 2003, 2004a, 2020; Parsons 1986). Hay varias esculturas que tienen glifos, como Estela 10, 21, Altar 1, 2 (Parsons 1986). Mesa-altar con base tetrápoda podría pertenecer al periodo Preclásico Tardío (Clark et al. 2010; Ito 2001b, c, 2004a, b, 2022a; Kaplan 1995).

En Kaminaljuyu se colocó un fragmento de estela sobre la estructura, mientras en Chalchuapa se ofrendaron los fragmentos de estela al frente de la fachada sur de la estructura. En Chalchuapa se excavó un hoyo para ofrendar el fragmento de estela con piedras. También muy interesante que se ofrendó una estela lisa grande acostada, como un rito para terminación de la función de estela. De hecho, primero se acompañó un altar liso y luego se excavó una parte de la estela y se enterró en la misma cavidad con otro altar liso invertido con unas vasijas invertidas, como fuera ofrendado desde el inframundo. También una Cabeza de Jaguar Estilizado se encontró quebrada en posición invertida. Así se vinculaba con el inframundo en El Trapiche para realizar los rituales hacia y/o desde allí. En Casa Blanca, también puede observar la misma manera de colocar invertida la escultura. La Escultura 2 tiene dos rostros uno está descubierto a la vista (Figutra 4c), mientras otro en el cuerpo enterrado en la posición invertida. En Chalchuapa fue muy importante el ritual para mandar el muerto al inframundo y repetir la visita a su ancestro.

La técnica escultórica de Chalchuapa es semejante a la de Kaminaljuyu. También el tema e iconografía de los dos sitios son muy similares (Figura 6a y b). El símbolo de "U" se encuentra en Izapa, Kaminaljuyu, El Jobo entre otros. El símbolo "U" del fragmento de estela es muy semejante al de la estela de D-III-1, Kaminaljuyu (Figura 6a, c). El símbolo de "U" aparece en su disfraz en las estelas 10 y 11 de Kaminaljuyu. En Estela 10 se encuentra el dicho símbolo con una frecuencia (Figura 13a). En Estela 11 también se ve en las cejas de las máscaras de cabeza y de cinta. Kaminaljuyu y Chalchuapa compartieron la ideología a través de la escultura pétrea con algunas diferencias. El símbolo de "U" representaría el poder político o religioso. En El Trapiche se ha ofrendado en el acceso a la Estructura E3-1 y en la D-III-1 (KJ) estaba colocada sobre la estructura. Las ofrendas de estela podrían haber vinculado con un rito para el poder local.

También se encuentran semejanzas y diferencias entre las cerámicas de Kaminaljuyu y de Chalchuapa. Hay un mismo tipo de cerámica como café-negro con decoración esgrafiada o inciso fino, y anaranjado con decoración negativa tipo Usulután

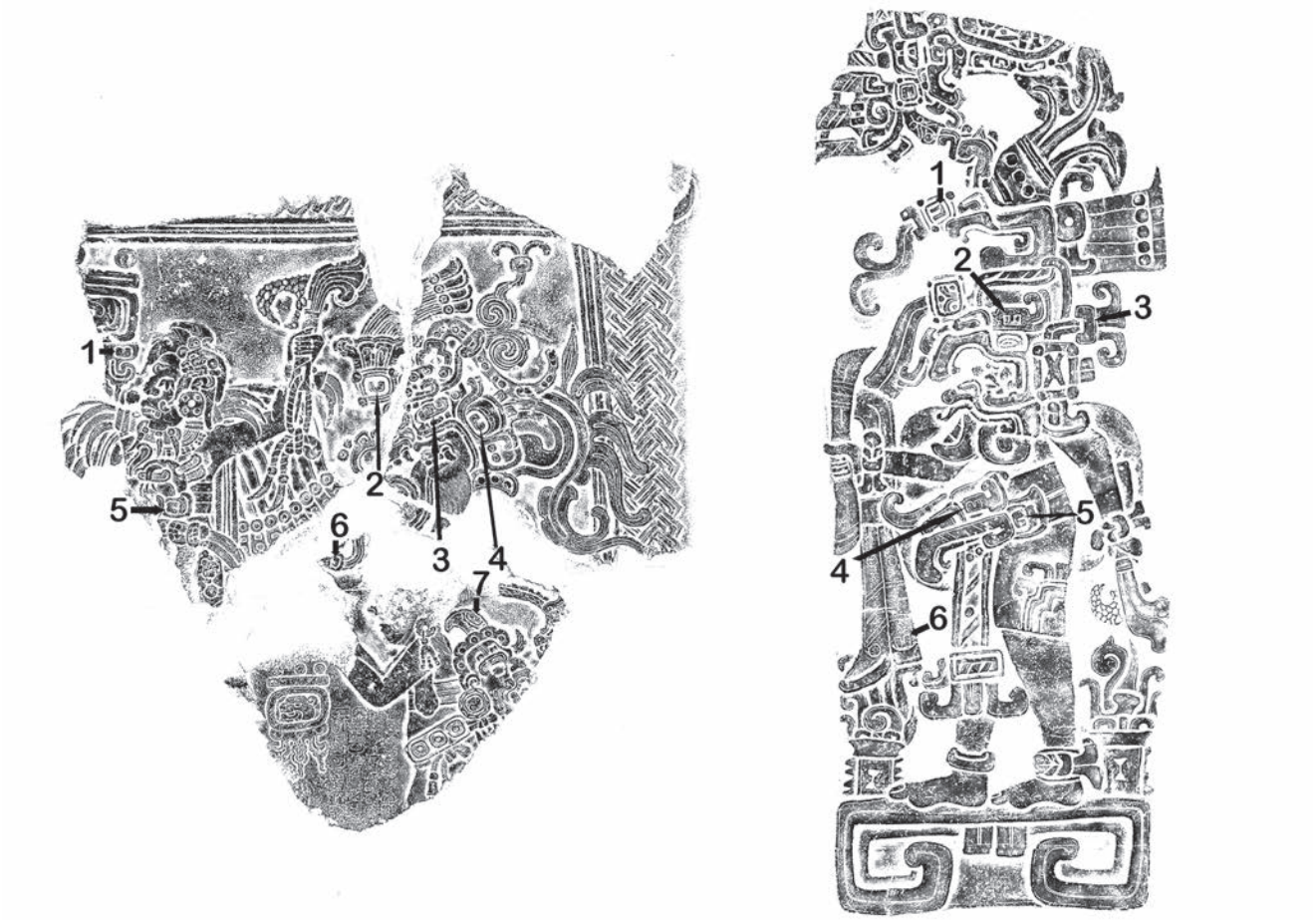


Figura 13 Símbolo de "U" en Estela 10 y 11, Kaminaljuyu

(Ito, ed. 2010; Ohi et al. 1994; Minami et al. 2000). La cerámica café-negra esgrafiada e incensario con tres picos no son comunes en Chalchuapa, sino solo en algún tipo de escondite o un lugar específico (Ito ed. 2010; Sharer ed. 1978). En Kaminaljuyu estas cerámicas se encuentran con una frecuencia, como las ofrendas de Mongoy (Ohi et al. 1994). La cerámica con vertebra es muy escaso en Chalchuapa, la cual se encuentra con una frecuencia en Kaminaljuyu (Ohi et al. 1994). Unas figurillas de Chalchuapa tienen algunas semejanzas, mientras otras muy diferentes. Una figurilla podría vincularse con niños héroes gemelos y otra con gordinflón de Santa Leticia o barrigón con ojos abiertos y mano levantada.

En Chalchuapa ya existía un calendario de Cuenta Larga con un sistema de escritura estructurado. Teniendo en cuenta que la fecha temprana con la cual llegó el sistema calendárico de Cuenta Larga hasta el extremo sureste de Mesoamérica en el periodo Preclásico Tardío, se extendió bastante rápido desde el inicio del uso del mismo sistema de Cuenta Larga hasta El Trapiche, tal vez a través de Kaminaljuyu, que tiene una técnica escultórica muy cercana a la de Chalchuapa (Figura 6a, c). Posiblemente en Kaminaljuyu podría descubrirse algún tipo de hallazgo arqueológico relacionado con la fecha más temprana de Cuenta Larga, ya que se encuentran varias esculturas esculpidas con glifos (e.g. Estelas 10, 21 y Altares 1, 2). Sin embargo, se identifican datos tempranos del sistema del calendario maya en el Petén, como en San Bartolo, el cual tiene fecha perteneciente al Periodo Preclásico Tardío (Saturno et al. 2006; Giron-Ábrego 2013). Por esta razón, es necesario explicar cómo y en dónde empezó el uso del sistema calendárico de Cuenta Larga, dónde se creó y porqué se extendió tan rápido en un área tan amplia desde Golfo de México hasta el extremo sureste de la Costa Sur de Mesoamérica. De hecho, en Preclásico Tardío, ya había agricultura intensiva en Kaminaljuyu por el canal y tal vez en Chalchuapa por los surcos, por lo cual es importante saber el tiempo de la siembra y otros trabajos correctos según la actividad solar. Posiblemente, se requiso un almanaque correcto para las actividades agrícolas.

8.CONCLUSIÓN

En la región de los mayas, durante el periodo Preclásico Medio inició la construcción del complejo arquitectónico de Grupo E en Ceibal, aunque se encontró más temprano este complejo arquitectónico en Chiapas, México (Clark et al. 2014; Inomata 2017).

Sin embargo, en Chiapas y Guatemala se encuentra el complejo arquitectónico de MFC, con unas excepciones de Izapa y Kaminaljuyu (Clark 2016). Love cree que en La Blanca se encuentra el eje arquitectónico apuntado al Volcán Tajumulco, y en Ujuxte (Retalhuleu) al Santa María para construir el complejo arquitectónico de MFC (Love 2016). Sin embargo, en Kaminaljuyu ni en Chalchuapa, no se encuentra Grupo E tampoco el complejo arquitectónico MFC. En el complejo arquitectónico de MFC, se vincula el eje arquitectónico con el Volcán local. En Chalchuapa hacia el noroeste desde la Estructura E3-1 se puede ver el Volcán Chingo, fuera del eje arquitectónico. En Kaminaljuyu tiene su eje arquitectónico de N-E 13-30º, mientras en Chalchuapa alrededor de N-E 8º, el cual es similar al del sitio Ujuxte (Santa Rosa) con el eje de N-E 96º, por lo cual puede ser vinculada a la actividad solar (Estrada Belli 1999). Como Ujuxte (Santa Rosa), puede ser vinculada a la actividad solar en Chalchuapa. Ichikawa y otros creen que en Chalchuapa tiene un complejo arquitectónico triangular o tríadico de tres estructuras en el periodo Preclásico Tardío (Ichikawa et al. 2009). En El Trapiche, es probable que durante el periodo Preclásico Tardío las Estructuras E3-1, E3-2 y E3-3 formaban el complejo triangular, aun se encontraba E3-6 hacia el oeste de la E3-1 y E3-4 hacia el suroeste. Tomando en cuenta las Cabezas 1 y 2, que se relacionan con la actividad solar, dicho complejo arquitectónico podría ser una modificación del MFC o Grupo E para la función astronómica. Sin embargo, hay que ver contemporaneidad de las tres estructuras y combinación con otras estructuras. Bove cree que las estelas y altares lisos relacionan al equinoccio y solsticio entre otros. También señala que entre las entidades políticas de la costa y tierras altas hay diferencia, ya que Ujuxte (Retauleu), como entidad política grande en la costa, no tiene estela lisa, mientras Giralda, con una distancia de 6 km de la costa, tiene barrigón y otras esculturas (Bove 2011). También en Monte Alto, se encontraron varios monumentos y rocas lisos, barrigones y una máscara de piedra verde (Shook s.f.; Parsons 1986). También podría tener trono, como altar compuesto con base tetrapode, ya que se encuentran unos altares lisos parecidos a la parte superior del Altar 9 (Tak'alik Ab'aj).

A propósito, análisis de obsidiana en Nacbe indica que durante la fase Ox (Preclásico Medio-Tardío: 1000-300 a.c.) más de 60 % de obsidiana viene de Jilotepeque (Hansen 2005). Sin embargo, cerca del yacimiento de Jilotepeque, no se encuentra una entidad política grande. Solo Urías tiene estructura y estela lisa (Braswell y Robinson 2011). También indican que en Kaminaljuyu aproximadamente 90% de la obsidiana viene de El Chayal, mientras en Urías más de 60 % de Jilotepeque. La cercanía del yacimiento de obsidiana no es requisito para ser la entidad política grande en Urías. Es importante la productividad agrícola para liderar la región, ya que en Kaminaljuyu funcionaba el canal para la agricultura intensiva.

Había intercambio cultural entre Kaminaljuyu y Chalchuapa a través de la cerámica y escultura. Demarest indica que una distribución simple de la cerámica no se identifica con la etnicidad, tampoco significa extensión del poder político según el análisis de cerámica y escultura (Demarest 2011). De hecho, los dos sitios no comparten una cultura única, sino cada sitio tiene su propio desarrollo e ideología. Es decir, las dos entidades políticas eran independientes pero vinculadas mutuamente hasta al cierto nivel sin perder identidad local. Traxler y Sharer define la entidad política "Polity": Complex hierarchical and territorially based political system (Traxler y Sharer 2016; Sharer et al. 2011). Podría ser Chalchuapa "Complex hierarchical and territorially based religious system" que tiene administración religiosa establecida en El Trapiche durante Preclásico Tardío. También en Chalchuapa estaba la institución religiosa a través de la ideología de la Cabeza de Jaguar Estilizado con la jerarquía religiosa, la cual que se controlaba la región del Occidente de El Salvador políticamente, como una alianza religiosa y/o política. Hay evidencias del señorío de esta región, como Trono de Mesa-Altar con base tetrápoda (Monumento 6) y sistema calendárico de Cuenta Larga, que muestra el fragmento de estela con la fecha de Bak'tun 7. Es muy probable que Chalchuapa controlaba la región del Occidente de El Salvador, desde Rio Paz hasta San Salvador, políticamente con una jerarquía religiosa por la Cabeza de Jaguar Estilizado.

El Occidente de El Salvador formaba una región relativamente homogénea durante el período Preclásico Tardío en la cual la sociedad compartía una misma ideología y cosmovisión, plasmado a través de las esculturas de Cabeza de Jaguar Estilizado (Ito 2016; Ito, ed. 2014; Paredes U. 2012). Por su parte, Chalchuapa mantenía para ese entonces una tecnología de alta calidad y un sistema de escritura estructurado, también estaba destacando tecnológicamente en el Occidente de El Salvador, cómo se muestra a través del "Altar Tetrápodo" entre otros, como un trono o símbolo de poderío. A través de esta visión las esculturas representan poder e ideología, y es posible inferir que Chalchuapa fue la capital regional en el Periodo Preclásico de lo que hoy se comprende como el Occidente de la Republica de El Salvador. También tomando cuenta los sitios destacados, como Ujuxte, Kaminaljuyu y Monte Alto entre otros, en el periodo Preclásico Tardío es posible que había varias entidades políticas "Polity", como capital de la región local.

AGRADECIMIENTOS

Expresamos nuestro agradecimiento a la Sociedad Japonesa para la Promoción de Ciencia (No. 15H00714, 17K18525, 20H05131, 22H04928), como patrocinador principal del proyecto, Tanaka Geological Corporation, y a las personas que apoyaron durante las últimas temporadas del Proyecto: los arqueólogos en El Trapiche, Chalchuapa, así como también los estudiantes de la carrera de arqueología de la Universidad Tecnológica de El Salvador y la Universidad de Nagoya, Japón. Sin su colaboración incondicional no podríamos lograr los objetivos planificados para esta investigación arqueológica. A la vez agradecemos al Ministerio de Cultura de El Salvador a través de la Dirección de Arqueología. Al mismo tiempo agradecemos al Dr. Abraham Perdomo Pineda y a Doña Carola de Perdomo por su autorización y colaboración para realizar la investigación arqueológica en su propiedad, así como por su amable gestión y a los arqueólogos Shione Shibata, Akira Ichikawa, Carlos Flores Manzano, Misaki Fukaya y Nobuhiko Aiba por el valioso apoyo, Dr. Tomas Barrientos por la amable atención en el Archivo de las fichas y fotos de Edwin M. Shook, y a la arqueóloga María de los Ángeles Flores Jiménez por la revisión y el comentario del artículo.

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Sacrificed captives or venerated ancestors? A new insight into mass sacrifices from the Preclassic Southern Coast of Guatemala

Shintaro Suzuki, Héctor Mejía and T. Douglas Price

Introduction

The Pacific Coast of Guatemala constitutes one of the least investigated regions of Mesoamerica, not only archaeologically [Chinchilla 2020] but also bioarchaeologically. In the adjacent Mexican Soconusco region, recent studies [e.g. Blake et al. 1992; Chisholm and Blake 2006; Rosenswig et al. 2015] focus more on bioarchaeology. They have examined "old" remains excavated during previous decades [cf. Ceja Tenorio 1985; see also Love 1989] through the new techniques and discuss novel topics, such as Archaic subsistence in the region. There are naturally archaeological investigations of high impact on the South Coast of Guatemala, especially during the last decades of the 20th century [e.g. Coe 1961; Shook 1973; Shook and Popenoe de Hatch 1978]. There are also several works on human burials, for example, at El Ujuxte [Arredondo 2000, 2002], at Balberta [Arroyo 1987, 1990], and at Montana [Genovés 1997]. However, unlike Soconusco, most Guatemalan bioarchaeological studies were conducted by archaeologists with a particular interest in funerary treatments. Since then, there has been little attempt to re-evaluate human remains through new approaches.

Based on these situations, we have conducted bioarchaeological studies in the coastal region in the framework of the Regional Bioarchaeology Project in the Southwest Periphery of the Maya Area (by S. Suzuki), in collaboration with the *Proyecto de Registro y Rescate Arqueológico del Plan de Expansión del Sistema de Transporte de Energía Eléctrica en la Región de la Costa Sur y el Altiplano del Territorio Nacional Guatemalteco / TRECSA*, headed by H. Mejía, and with the *Centro de Investigaciones Arqueológicas y Antropológicas* (*CIAA*) of the *Universidad del Valle de Guatemala* (*UVG*).

This chapter is one of the products from the Project and is organized as follow. We first introduce the archaeological site of Sin Cabezas, Escuintla. The site was investigated about 30 years ago, and we re-visited its skeletal sample after decades of "abandonment". We continue with Reynosa, Escuintla, a vast site today hidden in a sugar cane field. H. Mejía recently excavated a massive burial there. We have worked on various aspects in both samples, so we summarize our bioarchaeology from both sites (Figure 1).

Besides, an important subject stood out throughout the

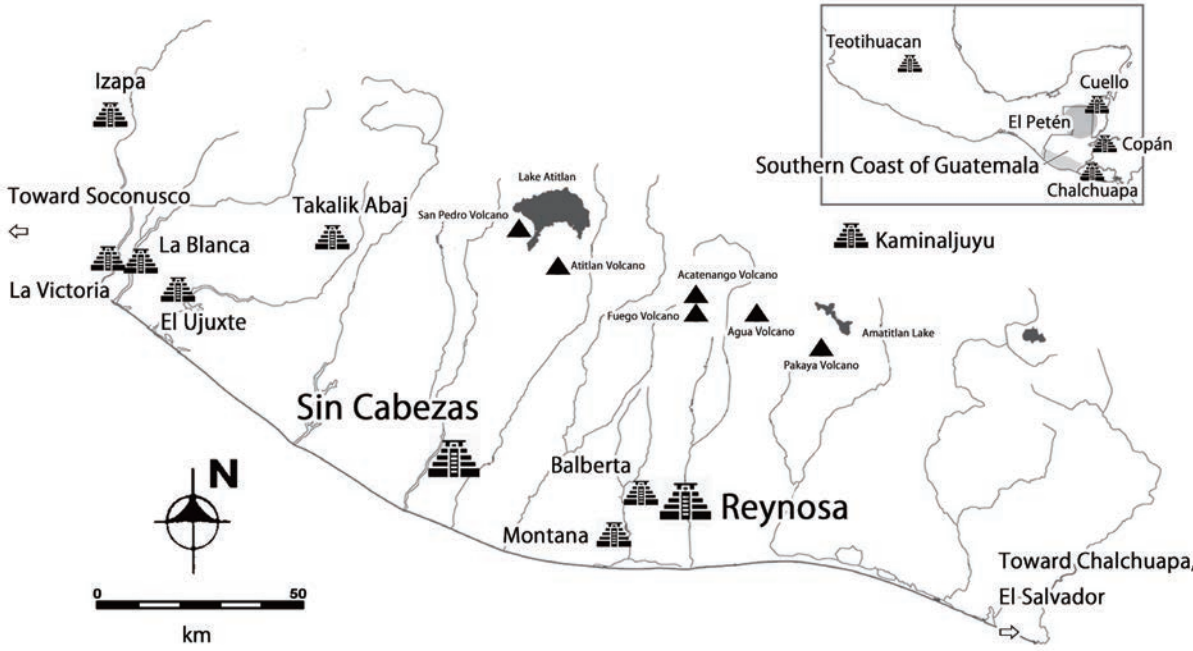

Figure 1: Sites mentioned in this chapter with some geological and archaeological landmarks. Sin Cabezas and Reynosa are marked with emphasis. Map elaborated by S. Suzuki based on the drawing by Chinchilla [2020, Fig.1].

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Project, not only in Sin Cabezas but also in Reynosa. It was the human sacrifice, especially the technical uncertainties in identifying it *in situ* and its theoretical abuses in archaeological terms. Although the topic was recently discussed in detail elsewhere [Suzuki 2021], we would like to return to it here. In this part, we add our new isotopic measurement results from Sin Cabezas and Reynosa. Because the identification of non-local victims was a key in some cases [Hoffmeister 2019], our isotopic results may provide a new perspective to interpret the Terminal Preclassic mass burial contexts, such as the cases of Chalchuapa, El Salvador, or Cuello, Belize. Are they sacrificed captives or venerated ancestors?

Overall Results of the Project

Sin Cabezas

The site (Figure 1) was first reported by Edwin Shook [1950] and was subsequently surveyed by Frederick Bove and Marion Popenoe de Hatch as a part of the Tiquisate Project [Bove 1989; Popenoe de Hatch 1987]. The work revealed a relatively dense concentration of settlements in the basin and that Sin Cabezas was one of the most important sites in the area during the Late-Terminal Preclassic [Whitley and Beaudry 1989].

From 1986 to 1992, Sin Cabezas was formally investigated by Marilyn Beaudry from UCLA. This project yielded 83 burials [Beaudry and Whitley 1989; Beaudry-Corbett 1990, 1991, 1992, 1993]. If we account for the mixed and disturbed miscellaneous remains, the sample probably amounted to more than 100 individuals. It was the largest skeletal sample ever recovered from the South Coast of Guatemala.

We are not the first who worked on the sample. That was Susan M. Colby [1991, see also her technical reports in Beaudry and Whitley 1989; Beaudry-Corbett 1991, 1993], the anthropologist of the UCLA project at the time. Thanks to her study, we know that there was high infant mortality, similar to other skeletal collections, such as Copán. Diet was concentrated in maize, with a severe nutritional deficiency, shortage of animal protein, calcium, and vitamin C.

However, it is necessary to recognize that after her study, the sample was practically abandoned in the storehouse (CERAMOTECA) of the *Instituto de Antropología e Historia de Guatemala* (IDAEH), the Guatemalan governmental authority of the archaeological material. When we visited the sample after decades, the bones were found in extremely deteriorated cardboard boxes and plastic bags. The context information marked on the bags was gone, and the correlative numbers of the boxes were lost. We would like, thus, to emphasize first the contribution of our project in this logistical aspect. Now the remains were re-evaluated based on modern osteology and re-organized according to all available information about the excavation context. They have been moved to a secure facility of the *Universidad del Valle de Guatemala* and relocated to new, appropriately labeled, plastic boxes (Figure 2). Of course, everyone interested in the sample can access them through the same governmental procedure.

As good products, it is worth mentioning two projects of

Figure 2: Storage of bone materials from Sin Cabezas in CIAA, UVG. Photos by E. Viñals.

undergraduate thesis research carried out by students of *Universidad del Valle de Guatemala*, one of our collaborative institutions of the Project. María Mercedes Acevedo [2021] focused on infant remains with pathological deficiency. There were very few individuals (n=5), so statistical tests could not be applied according to the quotidian protocol of modern bioarchaeology. However, the author introduced a new theoretical framework called "osteobiography" [cf. Hosek and Robb 2019] and was able to visualize the high-stress life of the infants who lived during the transitional time of the Terminal Preclassic. It was a vivid story told beyond the simple description made by Susan Colby [1991] in her first anthropological survey in the 1990s. Esteban Viñals [2022] more recently examined the dental pathologies of the adult population. Viñals evaluated dental caries and tooth wear of all available teeth in the sample and conducted several comparisons according to sex, age groups, and chronology. According to his results, the daily diet at the site did not change during the Late Preclassic and the Classic, perhaps indicating occupation by the same group with no significant cultural changes. The group had a lifestyle similar to other large pre-Hispanic urban centers, such as the Classic Copán.

Reynosa

Reynosa is located between the Acome River to the west and the Cojolate River to the east (Figure 1). Bove [2011] first reported the site in the 1980s as belonging to the Middle - Late Preclassic based on surface collected material. However, after the brief description, the academy has not considered the site until the re-discovery by Héctor Mejía. The Guatemalan archaeologist intervened at the site as a rescue operation and confirmed that it was a sizeable settlement with a possible association with the Olmecs of the Gulf of Mexico [Mejía 2017]. The major characteristic of the site, however, is a massive burial discovered in Mound 5. Indeed, the collaborative invitation that S. Suzuki received from H. Mejía to study this massive burial was the beginning of this Project.

In this skeletal sample, we also addressed several bioarchaeological topics. We first suggested that nixtamalized maize was not yet consumed by the population [Suzuki and Mejía 2017; Suzuki 2018]. Dental caries prevalence, tooth wear, reconstructed stature through long bones, and some preliminary results of carbon and nitrogen isotope measurement were combined and compared with what was reported from Copán, where a wide range of bioarchaeological studies are available. And then, the most feasible interpretation seemed to be different treatments of maize subsistence. Perhaps the nixtamalize technique was known already; however, the soft, rich, and nutritionally improved (nixtamalized) corn *masa* was not available for the whole population, somehow including the individuals studied here.

We also obtained relevant results on the raw material used in one of the earliest dental inlays in Mesoamerica through the scanning electron microscopy/energy dispersive X-ray spectroscopy (SEM/EDS) analyses [Suzuki et al. 2018; Sandoval et al. 2020]. Burial 38 and Burial 20 were the very early dental inlay carriers based on the radiocarbon analysis, associated ceramics vessels, and the excavation stratigraphy.

Burial 38 was an adult male, one of the presumed chiefs of the site who was the first to be buried in the context, and he had inlaid teeth with a material called goethite (glints like graphite). It is worth noting that he was at the deepest layer of the excavation. There was more than a 50 cm distance from the nearest upper strata with human burial. His interment, thus, could be a previous and separate event from the mass burial. Radiocarbon analysis also indicated he was earlier than the rest of the mass context, by around 200 years. Burial 20 was a secondary context [ritual bundle, Mejía 2016] containing the incomplete remains of an adult female. Her dentition showed a curious matrix (Figure 3); only the labial surfaces had a few small, embedded fragments of pyrite (brilliant like gold).

Based on this, the authors interpreted that the beginning of the dental inlay probably took place on the Pacific Coast, using the metallic glitter. After several centuries, a generic technique was developed that embedded small metallic fragments into the matrix, based on sand, soil, and some organic material. Perhaps the plasticity of the sand matrix made it easier to manufacture

Figure 3: Dental inlay from Burial 20. Photo by S. Suzuki.

the ideal morphology to be fitted to the enamel cavity, and the embedded fragments granted the same brightness as the whole metallic inlay. These are naturally preliminary interpretations subject to further examinations; however, it is noteworthy that it was the first attempt to renew the perspective on the origin of dental inlay since J. Romero [1958. See also 1986a, 1986b] postulated it in the Oaxaca Valley more than 60 years ago.

Sacrifice in the Southern Periphery

Technical uncertainties and theoretical abuses

From the beginning of our Project human sacrifice has been one of the most critical issues, especially in dealing with the Sin Cabezas and Reynosa samples. Colby [Beaudry and Whitley 1989; Beaudry-Corbett 1991, 1993] identified almost 20 sacrificed individuals from her first observation at Sin Cabezas. According to the author, they were companions of tombs or dedicated to large constructions, depending on their context. Mejía [2016, see also Mejía and Suzuki 2016] has also interpreted human sacrifice at Reynosa. From the first discovery of Mound 5, Mejía explained that there were possibly two important persons, leaders or chiefs of the site, and sacrificial rituals of dozen people commemorated their deaths.

Throughout the Project, Suzuki [2021] questioned the veracity of these sacrifices and pointed out influences, somehow negative, from the case of Chalchuapa, El Salvador (Figure 1). We present that case in detail.

Chalchuapa is a highly recognized archaeological zone located in present El Salvador, and consists of multiple sites: El Trapiche, Casa Blanca, La Cuchilla, Nuevo Tazumal, Tazumal, Peñate, and Las Victorias [Cobos 1992; Sharer 1978; see also Ichikawa 2017]. The Zone has a long occupation history from the Early Preclassic [ca. 1200-900 B.C.] until the Postclassic period (ca. A.D. 1400) and is thought of as one of the most powerful political entities of the southern periphery.

While the dimensions of the early structures are impressive, one of the criteria by which the dominant role of the site was judged, at least for the Terminal Preclassic, was the argument of Fowler [1984]. The researcher focused on the burials recovered in Structure E3-7 at the site of El Trapiche and argued that they were sacrificial victims: indeed, they were the captives of wars. According to the author, the political entity of Chalchuapa expanded regionally using militia and sacrificed war captives at a relatively isolated structure (E3-7) 240m west of the Central Plaza of the site. Thus, its political power was consolidated.

In order to evaluate the sacrifices at Sin Cabezas and Reynosa, in the context of the widely influential work by Fowler located closely, both spatially and chronologically, Suzuki [2021] focused on Fowler's criteria and contrasted them with those of Colby and Mejía. First, Colby's contexts differed from those of Fowler and Mejía. Those of Sin Cabezas were some individual sacrifices, mingling with funerary contexts in residential structures. So her criteria included funerary offerings, and even any unusual treatments were considered. On the other hand, the contexts of Fowler and Mejía were thought to be mass sacrifice. The structures of both E3-7 and Mound 5 were considered ritual spaces. Here the contextual and stratigraphic criteria were critical, where considerable quantities of bodies were found in very close layers. In both cases, these criteria alone are insufficient to determine sacrifice. The absence of grave goods in itself does not indicate any sacrifice. It is always possible that there were some organic offerings in perishable material. Although the abnormal and crowded concentration of bodies may suggest the structures were unique ritual spaces designed to contain the sacrificed bodies and to commemorate the sacrificial events, crowded burials *per se* are not indicative of mass sacrifice. It is known from Landa's time that the deceased were buried under constructions [Landa 2010[1566]], and it is common practice to find a high number of human skeletons when conducting any excavation in residential groups [e.g., Hendon et al. 2014; McAnany 2013; Welsh 1988]. However, a simple interpretive inference of sacrifice based on these insufficient criteria begins to have the gesture of "true identification" when combined with two more criteria. These are the ventral depositional and peri-sepulchral behavioral criteria, the latter involving binding and/or mutilation of limbs or decapitation.

Suzuki [2021] questioned these two criteria too, which seem to have been the most important ones after Fowler´s framework. His recent bibliographic examination revealed that the ventral position does not indicate any sacrifice either. In broad literature, there are numerous and clear funerary cases with ventral deposition, not only in the early horizon of the southern periphery [Amarolli 1987; Arredondo 2000, 2002; Arroyo 1987, 1990; Ichikawa 2017; see also Weiss-Krejci 2003] but also in Mesoamerica in general up to the Postclassic period [Pereira 2017].

The author also postulated doubts about behavioral criteria such as binding, mutilation of limbs, and/or decapitation; since they are also, in reality, archaeological interpretations based on the distributions of remains, i.e., how the bones were found *in situ*.

For example, at Chalchuapa, individuals whose hands were

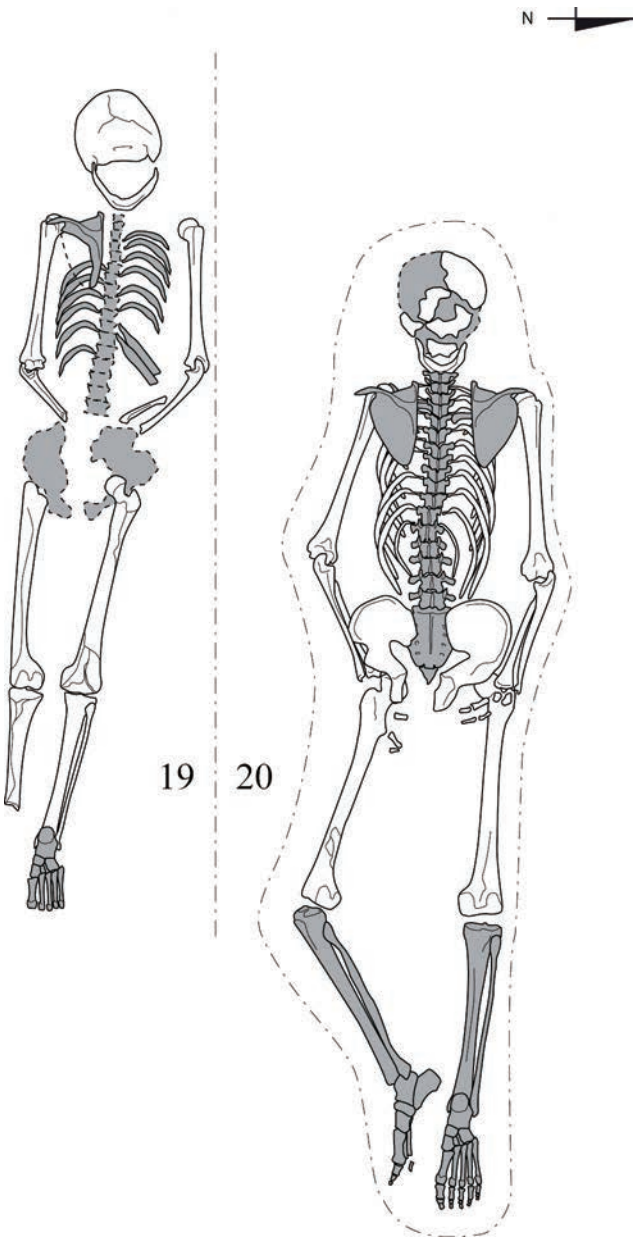

Figure 4: Burials 19 and 20 from E3-7, El Trapiche. Taken from Suzuki [2021, Fig.2, Drawing by H. Goudiaby].

"bound" were reported; however, most cases were determined based on the position of the forearms inclined towards the body's interior, for example, Burials 19 and 20 [Fowler 1984: 608-609] (Figure 4). We know that inclined forearm positions are explained by archaeotanatology without necessarily being due to bound hands. In direct burials with delayed filling, there is a natural force of the sediment applied toward the interior during putrefaction. It usually generates a strong constriction (Duday 1997: 114-115, 2009: 53-54), which may even rotate the contracted ulna and radius further into the decomposed body volume.

Fowler also asserted violent behaviors based on the "missing parts" [Fowler 1984: 607] without involving any positive observation of physical cut marks "of bone" [Botella et al. 2000: 69-78]. When any long bone of the limbs was not visible *in situ*, it was taken as evidence of *perimortem* amputation, e.g., Burial 23. The same discourse applied to the hands and feet, e.g., Burials 15 and 17 [Fowler 1984: 608]. Decapitations were suggested when the cranial bones were not seen at the excavations, e.g., Burial 22.

His archaeological interpretations were made in the 1980s and were naturally applaudable. The work might have been a landmark reference of the topic, at least in the southern periphery. However, through the notion from human taphonomy and archaeothanatology, Suzuki noted that his interpretation was somewhat premature and required much more reflection.

Macrofaunal interventions can cause a considerable level of dislocation of bony elements [Duday 2009: 28, 34] and collateral damage to them [Botella et al. 2000: 119-128], in which even the most robust long bones could become unrecognizable powders *in situ*. Observations of short bones also require more caution. They are difficult to recognize *in situ* (even worse, deteriorated and fragmented); however, they indicate what happened in the context and call for close and careful observation [Duday 1997: 124]. Small, spongy bones disappear more easily than long, compact bones during burial. It is called differential preservation by taphonomic-derived destruction [Duday 1997: 118, also see Stodder 2019: 83-84]. They may also be lost throughout excavations [Duday 2009: 89]. There are many archaeotanatological reasons why a simple disappearance of short bones cannot be taken as mutilation of hands or feet.

Likewise, post-sepulchral alterations are capable of explaining the absence of the skull. It is enough to recognize the upper cervical vertebrae that remain in the context, even if they are the smallest fragments. The same taphonomic logic [Stodder 2019: 83-84] explains that the skull was removed already decomposed. Vertebrae are fragile pieces that tend to disappear quickly, and the cranial bones, like occipital or mandible, are logically much more resistant. Furthermore, the cervical joints are labile [Duday 1997: 94,98, 2009: 25-28], and the skull can be removed from the early stages of putrefaction. A real decapitation anatomically tends to separate the head at the fourth, fifth, or sixth cervical vertebrae level. When we talk about decapitated skulls, therefore, it is necessary to specify inversely if the cranial elements were found together with the first cervical vertebrae or not. If the latter is the case, they are probably trophy heads extracted from another already decomposed and disarticulated contexts.

Suzuki never had access to the Chalchuapa skeletal material,

so he did not know if the violent behaviors postulated by Fowler left any "cut marks" on the bones. However, it is relevant to mention that throughout the Project, no cut marks were detected on any of the bones, not only in the Sin Cabezas sample but also in the Reynosa sample. Suzuki suggested thus that at least some of the sacrifices interpreted *in situ* should be incorrect.

Naturally, Suzuki's intention was not to deny all interpretations of sacrifice. Instead, his argument was to be more conservative in determining such interesting and important cultural intervention as sacrifice [cf. Tiesler 2007; Weiss-Krejci 2011]: and to promote much more interdisciplinary collaboration between archaeology and osteology to achieve accurate archaeothanatological evaluation from the excavation fields.

New insights from isotopic proveniencing of the sacrifice victims

We have completed strontium isotope measurement of several sacrificed victims in residential contexts from Sin Cabezas and in the massive burial from Reynosa. The isotopic identification of non-local individuals in the massive context was a key in similar massive burials from Cuello, Belize. Although there were contradictory ideas about the nature of the burial from diverse perspectives [cf. Robin 1989; Saul and Saul 1991; Weiss-Krejci 2003; McAnany 2013; Hammond 2015], Hoffmeister [2019] was able to determine that the contexts of Cuello were massive sacrifices based on the identification of the non-local victims. Thus, it is of great interest to recognize the possible origin of the victims in our case.

We dispense here with describing the basic mechanism and technical procedure of the isotopic proveniencing in bioarchaeology. There is a broad reference to consult [e.g., Price and Burton 2011; Price et al. 2015; Price and Freiwald 2022]. All the statistical tests have been conducted using Mac ToukeiKaiseki Ver. 3.0 and Mac TahenryouKaiseki Ver. 3.0, both are products of ESUMI Co., Ltd. Japan.

Sin Cabezas. We measured 9 cases of possible sacrifice at Sin Cabezas: *Rasgos* 11, 12, 21, 27, 27, 49, 53, and 57, all from Mound C4, Burial 1 from Structure E-14, and Burial 8 of Structure E-16. The results from strontium isotope measurement (n=9, average=0.7051, standard deviation=0.0004) are contrasted with the rest of the sample from the funerary contexts (n=27, average=0.7052, standard deviation=0.0005) in Figure 5. No outlier was detected in either group.

We applied the unpaired T-test, assuming the normal distribution because of our sample size (more than 30), and obtained results that there is no significant difference between the two groups (T=0.378, degree of freedom=34, p=0.708).

We could not include any modern faunal samples as bio-

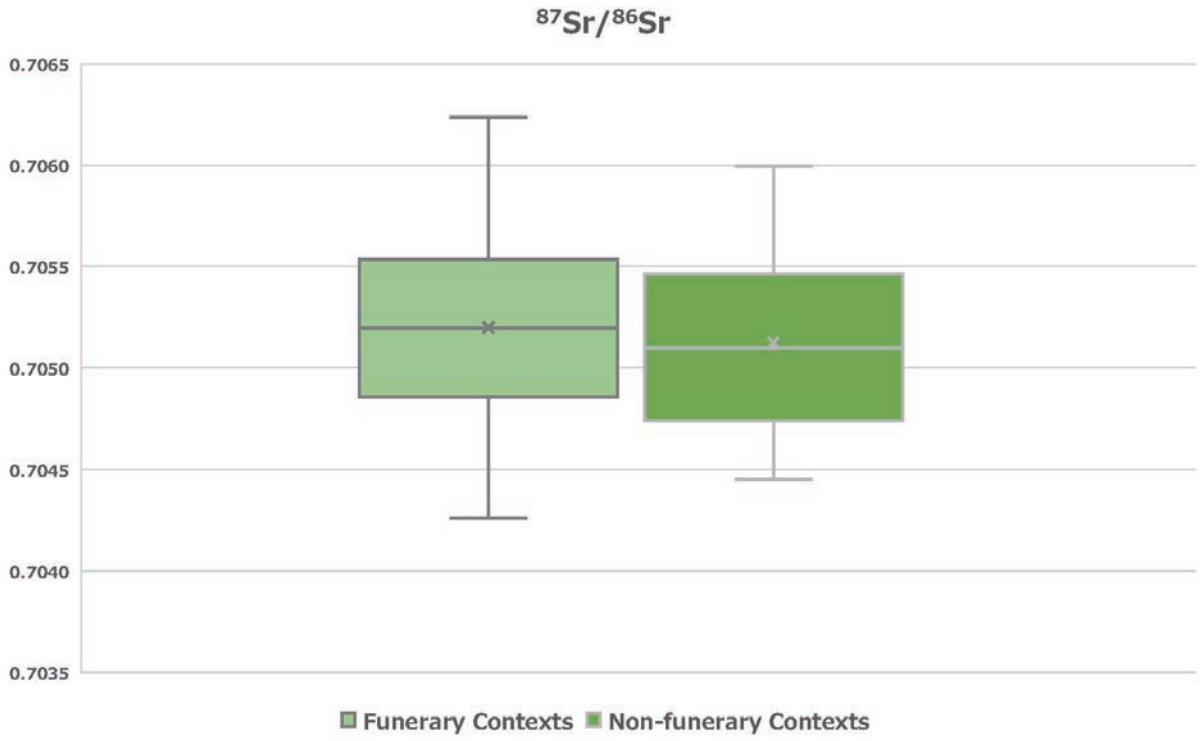

Figure 5: Contextual comparison of strontium isotope measurements.

available references. The agricultural activities around the site are massive, making it difficult to access. However, previous studies provide a good framework for interpreting the results in terms of provenance.

In the Mexican part of the Pacific Coast, several baseline data have been reported based on modern fauna [Price and Freiwald 2022: 498]. Averages are known: 0.7048 for the Paso de la Amada site; 0.7051 for Chilo, 0.7046 for Ojo d Agua; and 0.7047 for Izapa. In Guatemala, a similar range is also known based on modern fauna, for example, 0.7040 at Takalik Abaj. La Victoria, Retalhuleu, was characterized by a value 0.7059 based on modern faunal tooth measurements. A range between 0.7037 - 0.7044 was recognized in El Salvador from the modern faunal sample collected from ten archaeological sites [Suzuki et al. 2016]. Although there are points whose values are very different, for example, Pijijiapan, Chiapas, measured by two local modern dogs between 0.7072-0.7078, probably due to the salt effect [Freiwald et al. 2019], they are few.

We believe, thus, it is possible to establish a general range covering a wide southern coast area between 0.7040-0.7060. It is very likely that the sacrifice at Sin Cabezas did not include any non-local individuals. All victims were virtually natives around the site, at least from the same coastal region.

Figure 6 shows the combined results with the oxygen isotope measurements. Again, many points overlap, indicating that most of those sacrificed must be local. Only *Rasgo* 53 appears to be an outlier by its positive oxygen value. Although more positive oxygen values are commonly interpreted as a sign of different treated water (boiled or stored) intake [Scherer et al. 2015], the case remains to be discussed elsewhere, especially in osteobiographic terms.

Reynosa. We measured 19 individuals from Mound 5 (Figure 7).The average corresponds to 0.7043 with a standard deviation of 0.0002. Although one outlier was identified (Burial 10, Sr=0.7050), the sample appears much more homogeneous than Sin Cabezas. All values, including the outlier, fall within the South Coast reference range (0.7040-0.7060). All individuals are likely native to the region.

We will now compare Sin Cabezas and Reynosa. The unpaired T-test indicated a significant difference between the samples (T=7.518, Degree of freedom=53, P=0.000). Figure 8 visualizes the difference.

We believe that this is indicative that there is an internal iso-

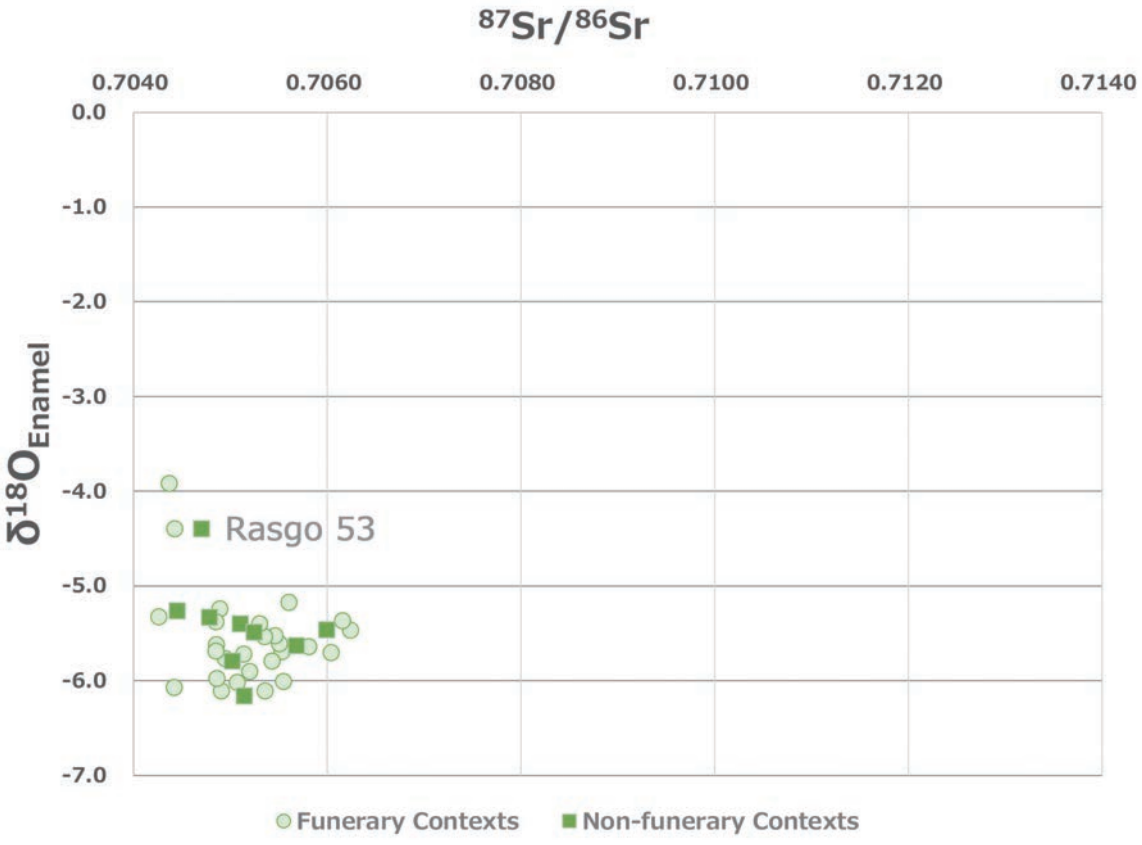

Figure 6: Scatterplot combining strontium and oxygen isotope measurements at Sin Cabezas.

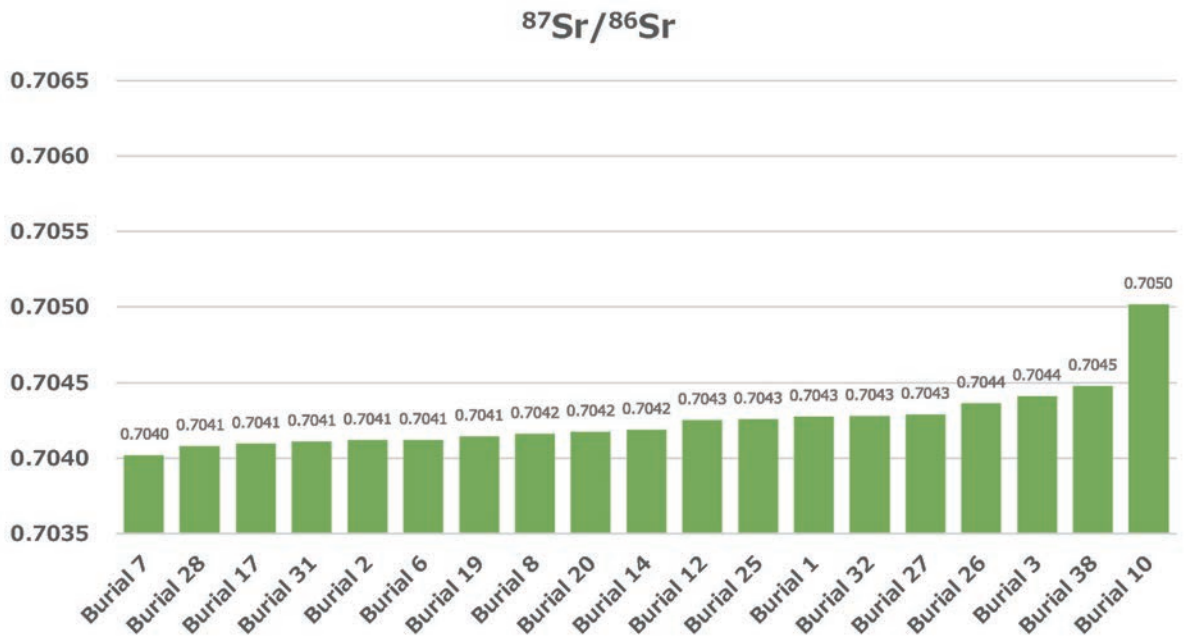

Figure 7: Results of strontium isotope measurement in Reynosa sample.

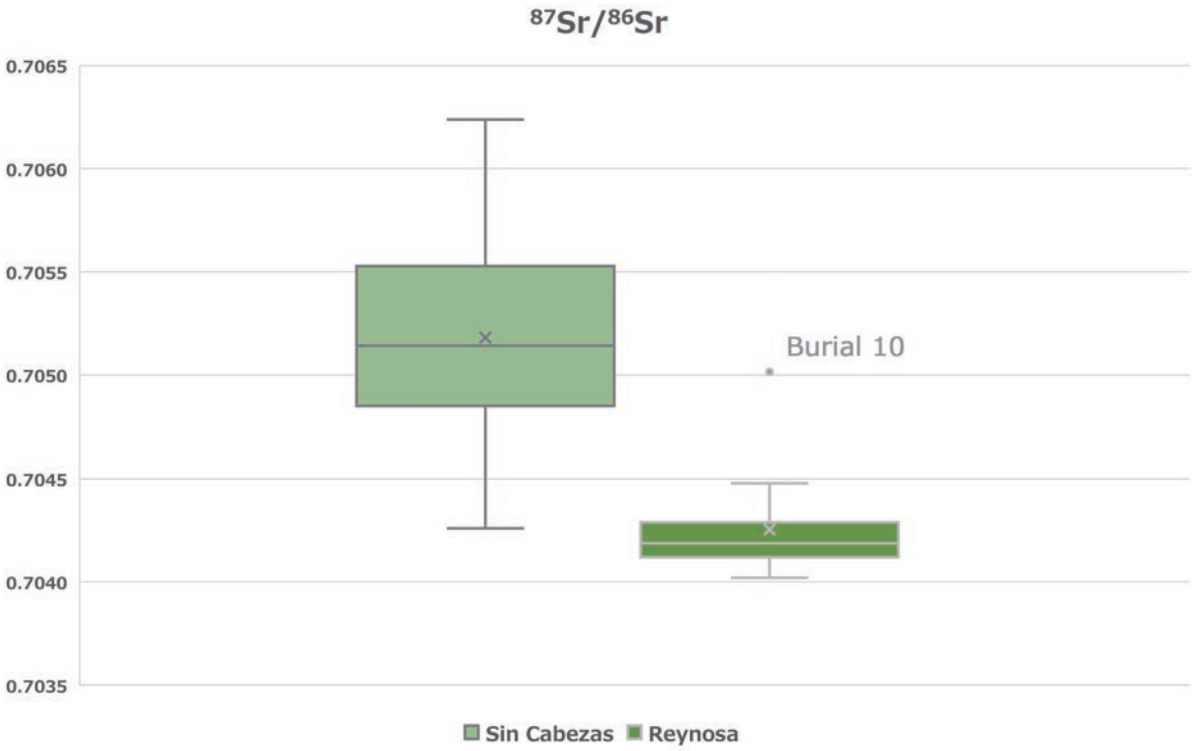

Figure 8: Comparison of results by the sites.

topic difference even within the South Coast, and it is possible perhaps to trace movements within the region. The present study is the first work that performed isotopic measurements of more than 50 archaeological individuals from the Pacific Coast and made the first considerable reference. Some individuals could come to Sin Cabezas from the Reynosa area, and the Reynosa's outlier could be someone from around Sin Cabezas. From this perspective, the high homogeneity of Reynosa's "victims" is interesting. Without a clear local reference to the site, they were all Reynosa locals, but they also could be all non-locals coming to Reynosa from somewhere else on the Southern Coast. Unfortunately, our research is ongoing, and we still need a clear answer.

The measurement of oxygen and carbon isotopes, which give much higher resolution to the perspective when combined with strontium isotopes, has yet to be done in Reynosa. We are now waiting for a collaboration where the whole genome of the individuals will be analyzed.

However, at this time, one case (Burial 5) from a funerary context of Mound 2 could be noteworthy. This only funerary case of the site yielded a value of 0.7043, practically the same average value of the sacrificed group. If this concordance is taken, the first interpretation of Mound 5 may be drastically transformed. A bloody site where the war captives from other villages were violently sacrificed could be a sacred place where the local ancestors were venerated. The ventral deposition, the close position of each body, and even the breaking figurines [Mejía 2016, Tomo I: 422] could be particular funerary treatments that we have not seen.

Naturally, the data are limited, and our interpretations remain preliminary. We emphasize that our attempt does not lie in determining the nature of the contexts through the "new scientific technology" but in activating and pushing further archaeological discussions by adding more aspects and perspectives provided by the new approaches. The isotopy or even more sophisticated approaches do not grant the answer but only help generate new ideas. Archaeological interpretations are volatile. They should constantly be re-examined and re-thought. In fact, in Chalchuapa where Fowler argued for the mass sacrifice of war captives, Akira Ichikawa [2017] recently raised a new perspective. Ichikawa conducted morphometric studies of the teeth, including four victims of the mass sacrifice of El Trapiche. The results indicated that there was little possibility that they were non-local. Furthermore, the Japanese scholar concluded, based on other isotopic studies of burials from other areas of Chalchuapa (La Cuchilla), that if there were conflicts, they should be internal without involving long-distance human movement, at least at a massive level.

Sometimes integrating such diverse perspectives from different disciplines in an archaeological interpretation is a complex work. Managing such different ideas is sometimes even unconfirmable. However, we believe it is always necessary to integrate more approaches as varied as possible. Our intimate collaborations of different specialties are the only way to get closer to the truth of the past.

Acknowledgments

S. Suzuki thanks Dr. Seiichi Nakamura and Dr. Takuro Adachi for the invitation to the volume, also Dr. Tomás Barrientos for his collaboration in UVG. The Regional Bioarchaeology Project in the Southwest Periphery of the Maya Area project was made possible by JSPS KAKENHI, Grant Number 17KK0023.

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A Study on the Development of Public Archaeology in El Salvador: for making better strategy on improving international cooperation of archaeological activities

Masakage Murano

Introduction

One of the most important Japanese contributions to the studies of Mesoamerican civilizations is activity related to the public archaeology. Akira Matsuda and Katsuyuki Okamura define public archaeology as a subject that examines the relationship between archaeology and the public, and then seeks to improve it [Matsuda and Okamura 2011: 4]. Many practices that Prof. Seiichi Nakamura and others at Kanazawa University have conducted at the Copan and Tikal archaeological sites are probably one of the best examples of this field.

However, the relationship between archaeology and the public differs from country to country, region to region, and period to period, and a public archaeology that is appropriate to each society must continue to be found. In this sense, the recent activities being developed in the Republic of El Salvador are worthy of attention. This is because the first international symposium on public archaeology in Central America was recently held there. This is a very ambitious undertaking, and it is likely to be a catalyst for further public archaeology efforts in the future.

This paper will therefore analyze the data from the symposium and related activities, and examine the direction of public archaeology in El Salvador, or in other words, what kind of public archaeology is considered necessary there. This discussion will also shed light on areas where foreign archaeologists can make a contribution.

Analytical perspectives for characterizing public archaeology

The field of public archaeology has developed in recent years. More specifically, the term "public archaeology" itself was first used in North America in 1972 [McGimsy1972], and in the United Kingdom, a journal under the name Public Archaeology was launched in 2000, and an international entity has also been established that practices public archaeology. In Japan, Matsuda and Okamura have been making efforts to popularize the field since the 2000s, and as a result several university students have already begun to major in this field.

It should be added that there have been many studies and practices that correspond to public archaeology in these countries and Mesoamerica before the name "public archaeology" was coined, but it is significant that this field has been made more "visible" to everyone with the acquisition of a name. As Daniel Saucedo Segami points out, many archaeologists did not consider the approach to the general public as a topic of academic interest, rather they considered it as a topic of personal interest [Sausedo 2014]. Therefore, it will be academically and socially meaningful to use this name to discuss and share practical knowledge on how to create a better relationship between archaeology and the general public.

A better relationship between archaeology and the public means, in other words, ensuring public access to the resources of archaeology. Archaeology is not simply the study of the human past using material culture. Archaeology is the study of finding cultural value and historical significance in ruins and garbage, and using them as educational, tourisum and cultural resources, for the benefit of society. What should we do if those resources are not reaching people adequately? For example, let us consider a case in which people in a certain society have difficulty in properly handling subsistence resources such as drinking water and education. Development theory teaches us the need to investigate the causes of the difficulties, remove them, and empower the people. Thus, in reference to development theory [Sen 1999], it would be possible to phrase public archaeology in this way. That is, public archaeology is "an effort to remove the causes of inconvenience between people and the archaeological or cultural resources produced thereby, and to increase the real freedoms of people to enjoy". Therefore, public archaeology can be considered part of the development act.

The challenges lying between archaeology and the public are numerous. The practices and theories for their improvement are therefore also multiple. Following the work of Merriman [2004] and Holtorf [2007], who critically categorized and modeled these issues, Matsuda and Okamura [2011] have organized them into four approaches. The four approaches are: Educational, Public relations, Critical and Multivocal approaches. The Educational approach views the archaeologist as a transmitter of knowledge

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and aims to help the public understand the past and the discipline of archaeology from a similar perspective. The Public Relations approach aims to create a better image of archaeology in the minds of the public by developing promotional and appealing activities for archaeology, thereby gaining more social, economic, and political support for the discipline. These two approaches are practice-oriented, while the other two are theory-oriented.

The Critical approach relies on critical theory as it is referred to in the social sciences. This approach seeks to examine how the practice and interpretation of archaeology relates to and contributes to existing social and flag political regimes. This approach is a powerful tool for examining archaeology and nationalism, indigenous issues, etc. The Multivocal approach explores how the material traces left behind by humans in the past can have diverse meanings to people in the present. For example, a site may be an object of archaeological study for an archaeologist, but it will not have the same meaning for people in different positions, such as local residents, tourists, politicians, or developers. Therefore, the main focus of this approach is to first understand how different groups in society interpret archaeological sites and artifacts, and then to make the most balanced decisions about their preservation and use. In the United Kingdom, the first two approaches were the mainstream for a long time, but since the late 1980s, with the rise of Post-processual archaeology and New museology, the latter two have developed, and there has been heated debate on what position to take.

In this sense, as Matsuda and Okamura [2011] point out, it is important to understand what type of public archaeology is dominant in each country through this classification. Because it will help us understand the characteristics of each country's public archaeology and consider next steps, such as further refining and developing the leading approach, or becoming aware of other approaches and trying them out. In El Salvador, too, such discussions are likely to take place in the near future. As a first step, this paper will examine the characteristics of public archaeology in El Salvador based on these four approaches.

History of Archaeology and Cultural Heritage Management in El Salvador

19th century to late 20th century

In order to examine public archaeology in El Salvador, it is first necessary to understand the history of archaeology and cultural heritage management as a background. This section tries to summarize them, based on data obtained through conversations, interviews, and daily interactions with archaeologists and museum personnel in El Salvador, as well as through a bibliographic survey.

There are several academic studies that summarize the history of archaeology in El Salvador. Among them, according to Geoffrey McCafferty et al. [2012], it is possible to classify them into four periods. The first period (19th to early 20th century): activity due to the interests of wealthy travelers and landowners; the second period (1920s to 1950s): the beginning of scientific surveys by archaeological experts; the third period (late 20th century): large structures and wide-area surveys; and the fourth period (2000s to present): Salvadoran-archaeologists-led surveys. Of these, the fourth period is regarded as the most exciting. The establishment of this fourth period is, for better or worse, one of the characteristics of El Salvadoran archaeology. This means that before the fourth period, there was a long period of archaeology in which the people of El Salvador were not the main actors.

The launch of official organizations related to archaeology in El Salvador is not late compared to other countries. The first of these was the establishment of the National Museum of Anthropology (Museo Nacional de Antropología) in 1883, followed in 1928 by the creation of the History Department within the Ministry of Education (Departamento de Historia, Ministerio de Instrucción Pública). The first director of this department was Antonio Sol. He was an El Salvadoran archaeologist. It is interesting to note, for example, that Sol's report on the archaeological site survey mentions the connection between the past history and the formation of the nation. In the period around the establishment of the History Department, the search for what characterizes the people of El Salvador also turned its attention to cultural aspects. Among them, there was even the idea of treating indigenous peoples as "National Soul (alma nacional)" [López Bernal 2007].

However, when the military regime came to power in 1929 due to the social crisis triggered by the Great Depression, the indigenous people were thoroughly persecuted, and in 1932, there was even a massacre called La Matanza. The indigenous population became invisible. For example, in the Census of Nationalities (CENSO), the category of ethnicity (categoría étnica) was deleted after 1930, and it was not until 2007 that it was included again. Publications on indigenous peoples have also had to be postponed.

On the other hand, archaeology, which also deals with indigenous cultures, began to be investigated by the Carnegie Institution as early as the 1940s. Archaeology dealing with the "dead" indigenous peoples of the past was not as problematic for the administration at the time as anthropology dealing with the "living"

indigenous peoples of the present. The double standard [Ochiai 1996], also seen in Mexico and elsewhere, was taken. The institute conducted the Maya Research Program in Mexico and Guatemala and other areas beginning in the 1930s, which led to the development of research on the Maya region. In El Salvador, the Tazumal site, which later became a national park, and other sites were excavated and developed.

The research conducted by this team led to the formation of the concept of "Maya areas". It also influenced subsequent research in El Salvador. During the third phase of archaeological research in El Salvador in the 1960s, the goal of North American archaeologists was to understand the "periphery" of the "Maya region". This perception of El Salvador as a "peripheral" region (and thus as neither distinctive nor highly civilized as the Maya) has fluctuated, but still exists among researchers and the general public. The "peripherality" of the archaeological perception of the region, a characteristic of El Salvadoran archaeology, was created during this period [Paredes and Erqucia 2013].

In 1945, Stanley Boggs, an American archaeologist who was a member of Carnegie's research team, became head of the Department of Archaeology of the Ministry of Popular Culture (Departamento de Excavaciones Arqueológicas del Ministerio de Cultura Popular). He contributed greatly to the archaeology of El Salvador, and was even later described as the father of Salvadoran archaeology [El Diario de Hoy 2005; Murano 2010]. For half a century, with few exceptions, foreigners have held the position of chief of the archaeological section in El Salvador [Valdivieso 2010]. It was not until Fabio Amador in 1995 that an El Salvadoran archaeologist replaced foreign archaeologists. North American archaeologists mainly carried out the research projects, and the training of archaeologists in El Salvador lagged behind.

This situation has been assessed as a lack of interest by the state in using archaeology or history for nation-building [Escamilla 2015]. The author may add that the low interest was due in part to the invisibility of indigenous peoples and a certain peripherality in academic regional perceptions. In other words, the perception of the government and the general public that El Salvador is a place that historically lacks notable archaeological resources compared to others because it is a peripheral region and no longer has indigenous people to tell its history, and yet archaeological surveys are conducted by foreigners, has prevented the development of archaeologists in their own country.

Since 2000

This situation changed in 2000. It was the beginning of the fourth period. This was the first time that an El Salvadoran student majoring in archaeology graduated from a university in El Salvador (Universidad Tecnológica de El Salvador (UTEC)). A Japanese research team led by Kuniaki Ohi made a major contribution by providing practical guidance (Ohi 2000). After that, Shione Shibata, one of the team members, continued to be involved in human resource development at the archaeological department and university in El Salvador, and JICA's Japan Overseas Cooperation Volunteers (JOCV) also cooperated. The author was one of them. At any rate, it was during this period that El Salvador was able to train and produce its own archaeologists.

The first five graduates of the program are known as the "First Generation," and later became heads of the Archaeology section, Director of the Cultural Heritage Department, university faculty members, and museum directors. In other words, they became the driving force of archaeology in El Salvador. Today, nearly 20 archaeologists hold positions in the government's cultural administration, while the rest teach at the university, pursue graduate studies, or work as consultants.

Around this time, a specialized agency for cultural administration was established in 1991 as the Council for Culture and the Arts (Consejo Nacional para la Cultura y el Arte). In 2009, it was reorganized as the Secretary for Culture (Secretaría de Cultura de la Presidencia). In April 2018, it was promoted to the Ministry of Culture (Ministerio de Cultura). As for the legal system, the Special Law for the Protection of Cultural Properties was enacted in 1993, followed by the Guidelines for the Special Law for the Protection of Cultural Properties in 1996, and the Guidelines for Archaeological Excavations in 2007. The number of archaeological parks and museums is also numerous, including the opening of the Casa Blanca Archaeological Museum in 2002, the opening of the Cihuatán Archaeological Park in 2007, and the complete renovation of the Eastern District Museum and the Tazumal Archaeological Park Museum, which has been described as a kind of "boom" situation [Montalvo 2002].

As a forum for the publication and dissemination of the results of academic research, a Central American Archaeological congress (Congreso Centroamericano de Arqueología) has been held in El Salvador every other year since 2005, a Student Forum of Anthropology (Foro de estudiantes de la escuela de antropología de la UTEC), and numerous other lectures and workshops have been held at the National Museum of Anthropology and other institutions. In addition, academic books have been published as tools for sensibilization and dissemination, and the Central American Archaeological Congress published its

first book (Estudios de arqueología: México y Centroamérica) in 2017, which includes the papers presented at the 6th Congress, and plans to continue publishing in the future. In addition, in 2014, the publication of Anales, Revista del Museo Nacional de Antropología Dr. David J. Guzmán, which had been out of print since 1977 and only published once in 1996, was republished. Other journals that regularly publish archaeological research include La Universidad (published by Universidad Nacional de El Salvador) and Kóot (published by Universidad Tecnológica de El Salvador). Notably, in 2006, for the first time, a map of the country's archaeological sites was produced, showing all the sites known at that time. This map visualized the presence of archaeological sites throughout the country. Thus, in line with the development of human resources, we can see that organizations, legal systems, places for publication and exchange of research results, and dissemination tools have been put in place very recently and at a considerable pace. This "youthfulness," so to speak, is another characteristic of El Salvador's archaeology.

Among these movements, one that has become particularly prominent in the 2010s is the search for an "El Salvadoran Archaeology (Arqueología Salvadoreña)" [Escamilla 2015]. Although it has not yet taken concrete form [Escamilla 2015], it is a movement to form its own archaeology in El Salvador, one that is distinctive from the other countries. This is an appropriate move at a time when the archaeology of El Salvador is reaching a certain "maturity".

The characteristics of the current archaeology of El Salvador become clearer when considered in conjunction with the following events. First, in 1994, the Council for Culture and the Arts declared that "the most urgent need is the search for our El Salvadoran identity". Second, the Tazumal and San Andrés archaeological sites, which are representative of the country, have been used on the country's banknotes since 1993 (the issue ended with the dollarization of the currency in 2000), and the image of the Tazumal site has been available on the identification card (DUI. Documento Único de Identidad) since 2010. This has promoted the visualization and symbolization of the archaeological sites. In addition, the Census of Nationalities (CENSO) has been reinstated in 2007 with a section on indigenous peoples as an item to be examined in the Census of Nationalities, in response to suggestions of improvement from outside sources, such as the United Nations. Based on the idea that census, museums, and maps function as institutions that form "imagined communities" [Anderson 1983], the actual impact and other factors should be carefully considered, but El Salvador is currently actively trying to link its archaeological heritage to its national identity. This is a major difference from the third period, especially before the civil war.

In this respect, the search for identity overlaps with the movement to form an "El Salvadoran archaeology". In other words, it appears to be a movement to seek some kind of recognition for their archaeology by the public. Moreover, the approval for archaeology by non-archaeologists is also needed to resolve important issues that have arisen as archaeology has developed. In El Salvador, for example, it is not yet common for students who have studied archaeology to go on to graduate school. Even though some are interested in going abroad for more advanced education, the number of students who can go abroad is still few. One of the reasons for this is the financial burden on students, and approval for archaeology by people and governments is needed before grants and other programs can be developed in the future.

Other issues are also beginning to emerge. Although the number of archaeologists is increasing, the staff of the archaeology division of the Ministry of Culture in the capital city must carry out work throughout the country. As a result, there is inevitably a bias in the areas where preliminary surveys and inspections can be conducted [Valdivieso 2014]. Therefore, proposals for reform from a centralized to a decentralized system have been seen in recent years [Valdivieso 2014]. Even though there is employment at the moment, if the number of graduates continues to increase, more will not be able to find work. However, the establishment of cultural property protection or archaeological departments in local governments could solve these problems. For this reason, the approval of archaeology to people and governments is essential.

Thus, in the fourth phase, archaeology and cultural policy have entered a new phase, with goals and challenges of a different quality than in the past. So, in this current position of archaeology in El Salvador, what kind of relationship are archaeologists trying to establish with the general public? What exactly are they trying to do by using the name of public archaeology? In the next section, we will examine this question using the data obtained at the workshop and symposium held in El Salvador.

Analysis of Trends in Public Archaeology in El Salvador

Public Archaeology Workshop

The workshop was held on December 7 and 8, 2017, at the National Museum of Anthropology, hosted by the Archaeology Division of the National Direction for Cultural and Natural Heritage of El Salvador and the Kyoto University of Foreign Studies. The title was " Public Archaeology, a tool for strengthening iden-

Fig. 1 Poster of the Public Archaeology Workshop

tity (Arqueología Pública, una herramienta para el fortalecimiento de la identidad)". The main objectives were the following: 1. To share the Japanese experience in the field of public archaeology with students and professionals in Salvadoran archaeology. 2. To share with Salvadoran students and professionals in archaeology, the experiences of public archaeology that have been developed in El Salvador both by nationals and Japanese volunteers. 3. To stimulate in the participants of the workshop, the desire to integrate the society in the archaeological work, like protective agents and diffusers of the archaeological patrimony. In keeping this objective, five presenters from El Salvador and two from Japan reported on each other's projects related to public archaeology. Participants included archaeologists, anthropologists, and other researchers, students, lawyers, and government officials.

Of these presentations, the El Salvadoran side had a common feature. First, let us look at the Sofía Albayero's presentation. She listed the following six goals for public archaeology [Albayero 2019]: 1. To strengthen and revalue the archaeological sector as a dignified and necessary employment for society. 2. To disseminate the work of the discipline. 3. To involve society in the field of archaeological monuments, only up to the extent of its intervention without infringing the legal regulations for the protection of cultural property. 4. To bring the general public closer to the research and to explain the archaeological reality with suitable methodologies. 5. To make society aware of the value of the archaeological heritage. 6. To educate in values of conservation and respect for the archaeological heritage. As can be seen at first glance, her presentation shows that she is trying to make the general public aware of the value of the field of archaeology and the significance of archaeological heritage preservation.

Another presenter, Margarita Morán, was more data-driven, pointing out the importance of educational actions. She noted that interviews conducted through workshops at the Cihuatán and Tazumal archaeological sites revealed that participants had significantly low knowledge and information about archaeological sites, as well as about the legal system and organization of cultural heritage protection. She then stated that we must bear in mind that this type of work must be carried out permanently and with the involvement of other departments of this institution, as well as other governmental entities, to strengthen this initiative, because to the extent that people recognize the value of heritage, they will become protective agents of it, achieving that

the destruction due to ignorance is reduced while they can take advantage of this resource for the improvement of their living conditions. Thus, she also stressed the importance of action to make people aware of the value of their archaeological heritage.

Miriam Méndez' practice is a very progressive effort to link tourism and community development with archaeology, and she emphasized that public archaeology plays an important role in this process [Méndez 2017; 2019]. Her project had the following goals: To establish the bases of a public archaeology oriented to the strengthening of historical memory, identity and roots with the territory and to the valorization of the archaeological heritage seen not only as an element of identity, but also as a lever for development. She also listed the following three more specific objectives: 1. To turn the population into active agents for the protection, conservation and dissemination of their archaeological heritage, through a process of awareness-raising. 2. To turn their heritage into a reference of identity, an anchor of roots for the community and a valuable resource for its development. 3. To make the population aware of the importance and impact that the archaeologist's work contributes to societies. In this way, she was attempting to raise the awareness of the community involved with the site in order to ensure that the archaeological heritage fulfills its potential and does not lose its value.

A common feature of these presentations of public archaeology practices, as classified by Matsuda and Okamura [2011], is the emphasis on educational approaches. The importance of this approach can be seen in the desire on the part of archaeologists to make the general public more aware of the information and value of archaeology and archaeological heritage. Interestingly enough the participants in this workshop also shared common awareness of the issues. The answers to the question "What are the biggest challenges in the protection and utilization of archaeological heritage?" in the survey of workshop participants are instructive.

1. Lack of interest in archaeological heritage among landowners and the general public.
2. Society does not recognize archaeological heritage, so archaeological sites are not considered important and are not respected.
3. Land affiliation. Because many archaeological sites are not owned by the state, there are difficulties in protecting resources. There is no general outline to summarize the infrastructure, valorization of artifacts, importance that archaeological sites have, and a good safety system.
4. Smuggling of artifacts. Lack of public interest in archaeological artifacts.
5. Despite the existence of the Law for the Protection of Cultural Heritage, there is no clear direction for its effective implementation. Furthermore, there is little economic investment needed for the protection and development of archaeological resources. In addition, the general public has little education or information about archaeological resources. Therefore, they do not value archaeological resources.
6. Ignorance of the general public. Lack of budget. Lack of direction in archaeological research. Knowledge often remains at the academic level. Lack of promotion.
7. Lack of public awareness of the importance of cultural heritage. In addition, lack of interest from government agencies.
8. Need stricter laws on cultural heritage protection. Likewise, awareness needs to be created through education about cultural heritage in schools.
9. There is no culture in this country that values cultural heritage and gives importance to archaeological materials. People steal, sell, and destroy earthenware. There is no awareness of this.

With the exception of the point made in response 3 regarding challenges in government cultural policy, there are clear commonalities among the above responses. To put it simply, the general public is ignorant of the value of archaeological resources, which is why there is a need for awareness and education. A similar view can also be seen in the mass media. For example, under the title "Museums, a forgotten cultural resource," there is a reference to the fact that "the general public rarely values their own cultural identity on display and has no understanding of their artistic heritage" [Chicas y Canales 2010]. Of course, the circumstances surrounding each of these statements are very complex and should be treated with caution, but it can be said that the strong educational and enlightening orientation of all of them is a common characteristic. A similar orientation was evident at the next public archaeology symposium held after this workshop.

Public Archaeology Symposium

The First Symposium of Public Archaeology in El Salvador (I Simposio de Arqueología Pública en El Salvador, ISAP) was held from October 24 to 26, 2018, at the National Museum of Anthropology, hosted by the Ministry of Culture of El Salvador and the Kyoto University of Foreign Studies. The title was "Beyond Archaeology: Public Archaeology (Más allá de la arqueología: Arqueología Pública)". This was the first symposium

Fig. 2 Poster of the Public Archaeology Symposium

in Central America to focus on public archaeology and attracted many presenters from countries other than El Salvador, including Costa Rica, Guatemala, Honduras, Mexico and Japan. A collection of papers from this symposium was published in 2019 [Méndez et al. 2019].

The symposium's call for papers stated the purpose of this event. It is summarized as follows. Increasing interest in and commitment to cultural heritage is one of the priorities of social scientists, and if we take into account the official reason for archaeology as a social science, namely professional ethics, then activities related to heritage education are necessary and even urgent. This is because, on the one hand, it avoids confining archaeological research to academia and excluding non-specialists, and, on the other hand, it leads to the empowerment of those involved in cultural heritage.

This statement continues as follows: Cultivating identity about the places where we live, through education and sensitization, leads to knowing and valuing cultural heritage. Not only do people enjoy and learn about their cultural heritage, but also in terms of their social connection to and rootedness in a place, this heritage-rich place will not be of any use unless it is properly

Fig. 3 Result of mining analysis (Voyanto-tools) selected 45 frequently used words from the ISAP abstracts (except "arqueología" "arqueológico" "arqueológica")

protected, promoted, and preserved.

In this way, as the purpose of this symposium, it was emphasized the importance of archaeologists not only excavating and studying, but also disseminating this information and the findings to the general public, as this will lead to empowerment of people and social connection, and the strengthening of their identity. In line with this objective, five themes were established: 1. Importance of Heritage Education for the protection of archaeological heritage. 2. Public archaeology as a tool for strengthening identity. 3. Experiences in public archaeology. 4. Public archaeology and local and social development. 5. Dialogue with the public.

As a result, the presentations showed a different trend from the usual archaeological conferences. Figure 3 shows an image obtained through text mining analysis. Text mining seeks to extract useful and important information from document formats. By means of this technique 45 words were selected, depending on the frequency of their use in the abstracts of each presenter of the I SAP. If the same analysis is done with papers in general archaeology conferences, the words Maya civilization, potteries, tombs, etc. will be frequent. However, during this symposium it could be observed that many presenters talked about heritage, community, public, development and education.

A questionnaire survey was administered to presenters and audience at the symposium. The purpose of the survey was to determine the expectations and challenges of the symposium, and to help in setting the theme and improving the organization of the next symposium and the following ones. The question-

naire also asked questions relevant to this paper. The question was, "For you, what is "Public Archaeology"? This was a very interesting question. The responses provided an indication of the characteristics of public archaeology in this country and the expectations for public archaeology.

1. Action of different actors in support of archaeology.
2. It is the rescue of cultural public goods with a community purpose for their rescue, dissemination and maintenance in the local, national and regional territory.
3. Study of the relationship between archaeology and present society in all its fields in order to help communities by teaching them projects so that they can put them into practice.
4. It is a discipline that seeks to build two-way bridges with other areas and disciplines of knowledge, as well as with the different actors involved in order to create or strengthen identity.
5. Archaeology for and with the community, because knowledge must be transferred in a participatory manner and in active uses.
6. It is the branch of archaeology whose function is to link communities.
7. It is an Archaeology that serves to develop the relationship between Archaeology professionals and the general population.
8. A relationship between Archaeology and the community in a way that influences aspects such as political and social aspects within it in which they have access.
9. Branch of Archaeology or tool that allows to educate the population.
10. It is the means of transmitting information from archaeological specialists to the student community or to any interested society.
11. Promote students' knowledge of cultural heritage through educational programs, and ideally, field trips.
12. It is to communicate and share scientific research with the community and the general public.
13. It is the one that is made known to the public, thus serving to relate archaeology professionals to the population.
14. It facilitates the transmission of the knowledge obtained by practical archaeology to sectors of the population that do not belong to the archaeology guild in order to bring this knowledge to the entire population and not become an elitist study.
15. It is the way to return to the public. The advances and discoveries and projects of archaeology, a way to raise awareness and "vulgarize".
16. The socialization of archaeology that leads to the appropriation of archaeology by the population, which leads to an awareness, enjoyment and curiosity about the past.

The responses listed here show that public archaeology is viewed in a variety of ways. A certain orientation, however, can also be discerned. Although Responses 1 and 2 have different objectives (archaeology support and cultural heritage rescue, respectively), they share the idea of involving non-archaeologists. Responses 3 through 8 focus on precisely that relationship between archaeology and the public. These responses are similar to the definition of public archaeology as described above. In contrast to these, more clearly oriented can be seen on the responses 9 through 15. They focus on education and knowledge transfer, suggesting that they view public archaeology as an educational approach. It should be noted that Response 15 points out that it is to make people aware of archaeological discoveries and to vulgarize archaeology. "Vulgarize" means to popularize, to make more ordinary, or to make less formal. The idea of communicating archaeology in a more popular way, rather than through formal education such as school classes or lectures by archaeologists, can be seen as similar to a public relations approach. Moreover, the socialization of archaeology in the response 16 appears to be envisioned as a further step in the vulgarization of archaeology. In order to make the appropriation of archaeology by the public, archaeology must concede certain privileges so that non-archaeologists can deal with archaeology. Non-archaeologists' opinions will be treated on an equal footing with archaeologists. Such a position would, in a sense, resemble a multivocal approach.

Significant feature of public archaeology in El Salvador: Educational approach

The question of this paper was what kind of public archaeology was considered necessary in El Salvador. According to the data analyzed in this paper, it can be answered as an educational approach, as classified by Matsuda and Okamura [2011]. In addition, we found ideas similar to the public relations approach and the multivocal approach. The target of these approaches is the general public that still has little awareness of the value of archaeology and archaeological heritage. Public archaeology for such people not only revitalizes archaeology and preserves archaeological heritage, but also enhances cultural identity and attachment to the place where they live, and can even lead to community development. In a survey at the first Public Archaeology Symposium, a number of people asked for more detailed

Fig. 4 Outreach activities to the elementary school

practical examples of educational approaches and theories to be presented in the future symposium.

Based on these results, the next question arises: How can foreign archaeologists contribute to public archaeology in El Salvador with such a clear consciousness and orientation? First of all, we should consider how we could contribute not only in terms of producing archaeological results, but also in terms of educational approaches. With this question in mind, the author has conducted a survey of the public's perception of the archaeological sites since 2007 [Murano and Valdivieso 2007]. And, continuing with this survey, the author has conducted surveys of school teachers' awareness of and experiences with archaeological heritage, developed worksheets for children to learn about archaeological heritage, and given lectures on archaeological heritage at schools [Murano2008; 2011]. These could be put into practice in the author's case by working with schoolteachers and archaeologists, and were subsequently developed by Mizuho Ikeda and other JICA volunteers and Salvadoran archaeologists [Ikeda y Morán 2010]. Currently, archaeologists in El Salvador are actively developing their practices in various locations [Consuegra and Albayero 2013; Liuba Morán 2017; Margarita Morán 2019; Albayero 2019; Mendéz 2017; 2019]. Thus, experience is now steadily accumulating, and one contribution for foreign archaeologists will be to continue to collaborate in the same direction with archaeologists in El Salvador.

Second, it may be possible for foreign archaeologists to adopt other approaches that are currently not widely practiced. The need for a public relations approach and a multivocal approach, as mentioned above, has already been pointed out. The public relations approach has made extensive use of media such as movies, TV programs, and newspapers, and now, with the spread of digital technology, there are even more tools available. The fact that the approach can be used outside of El Salvador is important for foreign archaeologists, and should increase its availability and effectiveness of implementation in the future.

The multivocal approach is difficult to adopt as long as one believes that the general public has no value awareness of archaeology or archaeological heritage. In fact, the author's data show that even elementary school teachers visiting archaeological heritage sites do not have a grasp of basic information [Murano2011]. There are, however, non-archaeologists who are interested in archaeology and archaeological heritage. For example, artists should not be overlooked. Since 2007, the author has been working with artists on an experimental archaeological project [Murano2008; 2017; Murano and Sermeño 2019]. The project was to reveal ancient pottery pattern-making techniques. During the course of this experiment, when a pattern different from the ancient pattern appeared, it was easy to judge it as a failure from an archaeologist's point of view. However, to the artists, the patterns were beautiful and interesting. In other words, even though the archaeological value was low, the artistic

Fig. 5 Experimental archaeological project

Left: Observation of the results of a firing experiment, Right: New art work inspired by past technologies, "Identidad Fragmentada" (Foto: Henry Sermeño)

value was there. Such value cannot be realized if we only pursue archaeological answers, and even if we do, it will be dismissed as merely secondary. However, there are times when something other than the correct archaeological answers can add to the appeal of archaeology and archaeological materials. Such value should be cherished. The more archaeologists collaborate with other people, the more diverse the values will be founded. This is because the more diverse the perspectives on archaeological heritage, the more new logic to explain new value will be added. This will ultimately increase the value of archaeology and archaeological heritage.

Thus, to the extent that foreign archaeologists have a somewhat bird's-eye view of the local situation, they should be able to identify approaches that have not been adopted locally and work toward their effectiveness.

Conclusion

Due to the COVID-19, the 2nd Public Archaeology Conference, which Kanazawa University was one of the organizers, had to be postponed. This was a great disappointment, even though the call for applications had already begun. It is said that cultural activities in El Salvador are greatly affected by each change of government (as is the case in Japan as well). However, it is the function of public archaeology to consider and improve the relationship between archaeology and contemporary society, taking into account such political and social trends. In this sense, the development of public archaeology in the country is important for the future of archaeology in El Salvador.

Moreover, the movement to promote public archaeology in El Salvador has received good reviews from other countries. During the first symposium, participants from other countries expressed their hope that this was a very good initiative and that it would be continued. In other words, El Salvador is expected to lead other countries in public archaeology. When this expectation is actually fulfilled, there may come a time when other countries will even say that public archaeology is one of the "El Salvadoran archaeologies" that continue to be explored in this country.

Acknowledgments

I would like to express my sincere thanks to the Direction of Archaeology, the Ministry of Culture of El Salvador, especially Miriam Mendez, Margarita Morán and Shione Shibata, for their cooperation in the activities described in this article. I also thank Hiroshi Minami for his generous support of the workshop and symposium. I would also wish to express my deep appreciation to the Professor Seiichi Nakamura for his guidance from the time I was a JICA volunteer to the present.

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Dating the Moon Pyramid at Teotihuacan, Mexico – An analysis of ceramics [1]

Etsuo Sato

1. Introduction

1-1. Outline of Teotihuacan archeological sites

Teotihuacan, located in the Valley of Mexico at an altitude of about 2,300 meters, was one of the largest city-states in the Americas. It flourished from the 1st century BC to the 6th century. Architectural activities based on elaborate urban planning was believed to have been taken place between AD 1 and 150 in Teotihuacan.

The axis that served for the urban design was the "Avenue of the Dead," which originated from the Moon Pyramid (152m × 156m, 45m in height) (Fig. 1) and ran south through the central part of the city for about 4 km with the width of 45m. The temple, built on the Moon Pyramid, was deliberately positioned to overlap the sacred Cerro Gordo that rises behind the pyramid. This confirms that the Moon Pyramid was planned to be in harmony with the terrain of the valley and, at the same time, that its location had significant importance from the early years of urban formation [Sugiyama 2000: 33].

More than 20 temples were built along the "Avenue of the Dead." Among them, the Sun Pyramid was a massive monument measuring approximately 223m on one side and 63m in height. It is believed that the pyramid was constructed from around AD 1 to 150 and later expanded and rebuilt from around AD 150 to 250.

In the early 1970s, a "cave" was discovered seven meters below the Sun Pyramid, lying horizontally. Its entrance is locat-

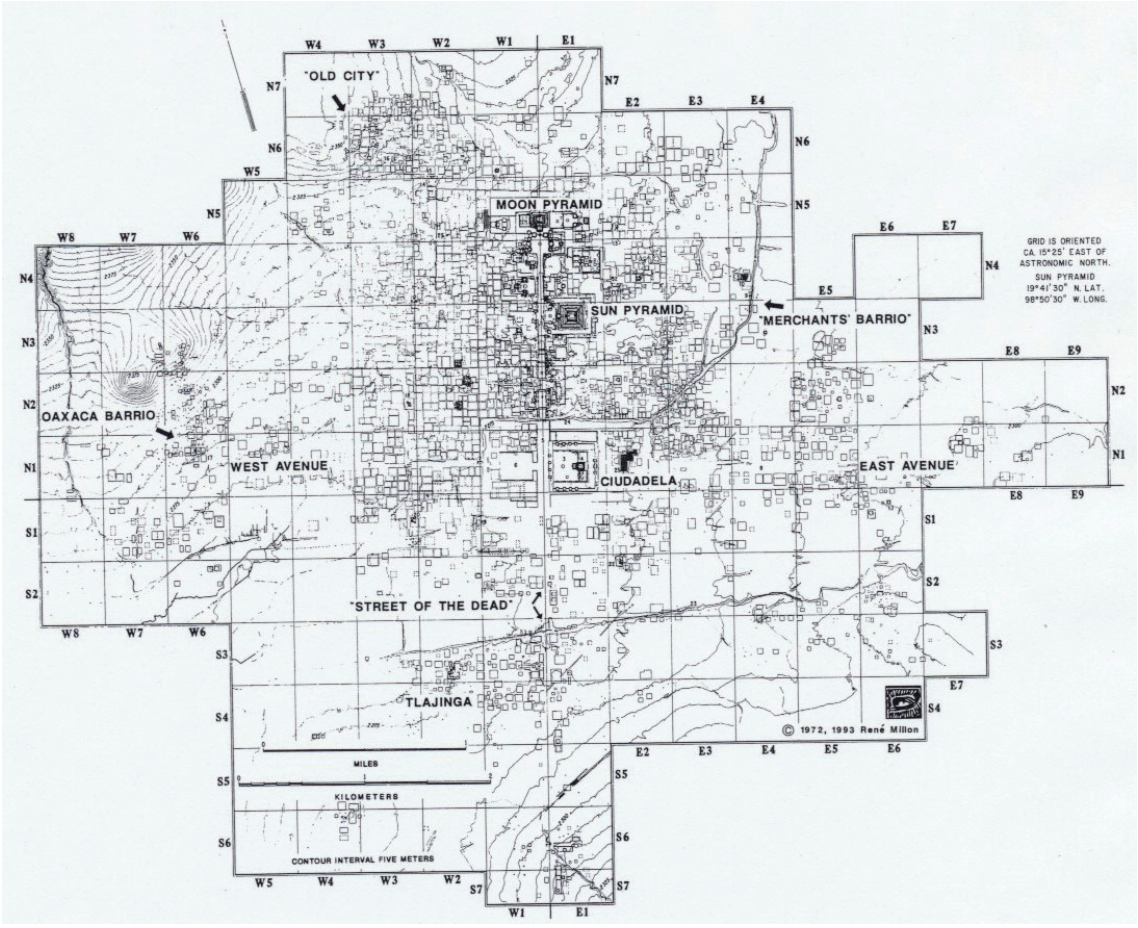

Fig. 1. Map of the entire city of Teotihuacan (Source: Millon 1993: Fig. 2, p.18)

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ed in front of the central stairs on the pyramid's front side. This "cave" was reworked during the Teotihuacan era, and traces of ritual use and robbing in later years were found. It is believed that the Sun Pyramid was built on a natural "cave" that carried sacred significance at the time [Heyden 1995 [1975], Millon 1981].

On the south side of the Sun Pyramid is a large square called "Ciudadela" (about 400m x 400m), and on the east side of the square is the Feathered Serpent Pyramid. This pyramid is the third-largest monument in Teotihuacan, measuring about 65m on one side and 20m in height. Unlike the Moon Pyramid and the Sun Pyramid, this pyramid's four sides were decorated with stone sculptures.

Around the city center were over 2,000 apartment compounds (Fig. 2) stretching over 20 square kilometers. At its prime, the population of Teotihuacan was said to be about 100,000. Dozens of rooms were constructed inside the apartment complex, sharing a courtyard, corridors, and a small shrine. Some of the groups living in the apartment compounds specialized in the production of crafts such as obsidian stone tools, ceramic, and textiles. Teotihuacan was a city-state that controlled the Mexican Central Plateau. Its influence extended to the city-states of the Mayan civilization such as the Tikal[2] and Copan[3] ruins.

The walls of the apartment complex were decorated with many murals [De la Fuente 1995]. Notably, one mural in the "Tepantitla" compound called "Paradise of Tlaloc (Tlalocan)" appears to have been the residence of high-status citizens. The mural depicted ball games, flowering scenes, butterflies resting their wings, and priests sowing seeds on the ground. The "Atetelco" residence compounds featured murals of animals considered to have been sacred in Teotihuacan, such as serpents, coyotes, and felines. Furthermore, compounds in the "La Ventilla" district, excavated by Ruben Cabrera Castro in the 1990s, contained not only murals but also 42 letters inscribed on the floor.

1-2. Purpose of this study

The first purpose is to determine the construction phase of buildings at the Moon Pyramid through ceramic analysis. The Moon Pyramid was expanded and renovated six times to form the current the Moon Pyramid. In this paper, the phase of each building from the oldest, Building 1 to Building 7, is determined with ceramic. When determining the construction date of buildings, radiocarbon dating is commonly used; however, data on the phase of ceramics excavated from the buildings and the ratio of the ceramics, that is, the chronological composition ratio of ceramic, is also important. In addition to the author, Ceferino Ortega and others conducted a ceramic analysis of the Moon Pyramid research. The author's data on the chronological composition ratio of the ceramic from each building can be compared with their data.

The second purpose is to examine the relationship between

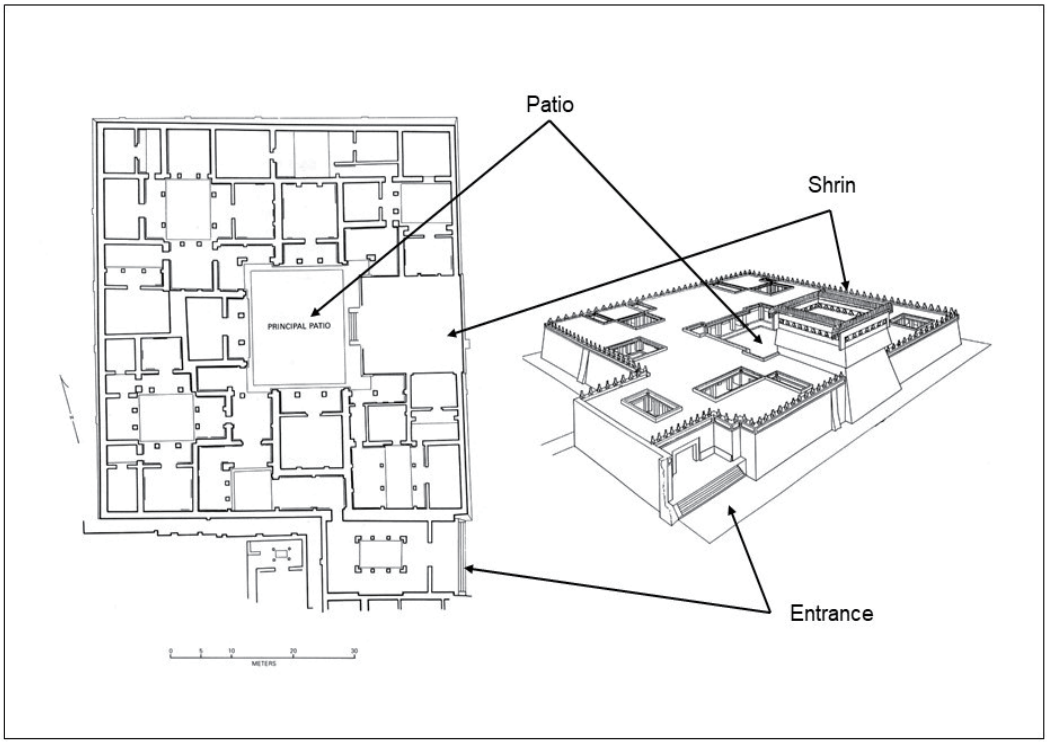

Fig. 2: Plan of Teotihuacan apartment compound (Source: Pasztory 1977: Fig.4.1, Fig.4-2, partially modified)

the Moon Pyramid and other monuments through ceramic analysis. Specifically, the paper examines the relationship between the seven monuments of the Moon Pyramid and the Sun Pyramid and the Feathered Serpent Pyramid.

2. Overview of past research projects

2-1. Teotihuacan archaeological research in the 19th century and 20th century

Many tourists and researchers, including Ramon Almaraz, filed reports on Teotihuacan in the 19th century. Almaraz was the first researcher who conducted a land survey of the Sun Pyramid [Almaraz 1995 [1865]]. It documented that the base of the Sun Pyramid was 232m north-south and 224m east-west.

In the 20th century, Leopoldo Batres excavated and restored the Sun Pyramid [Batres 1995 [1906]]. Batres moved a vast amount of the soil that covered the Sun Pyramid [El Imparcial 1995 [1906]: 122], restoring what was originally a four-tiered pyramid into a five-tiered building [Bastien 1951]. In the 1920s and 1930s, excavations began for constructing a tunnel into the body of the Sun Pyramid [Pérez 1995 [1935], Noguera 1995 [1935]]. Eduardo Noguera performed a detailed analysis of the ceramic, clay figurines, and obtained during the tunnel excavation. Notably, ceramics with negative patterns and Polychrome decorations were unearthed which resembled those from the Moon Pyramid.

Modern archaeological research began in the 1960s. From 1960 to 1975, William T. Sanders led an archaeological project that conducted distribution surveys and trial excavations of archeological sites throughout the Valley of Mexico [Sanders, William T., Jeffrey R. Persons, and Robert S. Santley 1979]. The results revealed the distribution of ruins and demographic movement from 1500 BC to AD 1519 within the 3,500 sq. km of the Valley of Mexico.

The University of Rochester's Teotihuacan Mapping Project, with René Millon as the project leader, began in 1962 [Millon 1973, 1974, Cowgill 1974]. The project team arranged 500m x 500m grids on the ground and surveyed buildings found in the area of 8.5 km east-west (maximum) and 6.5 km north-south (maximum). About 5,000 archeological sites were found within a range of 20 sq. km and artifacts such as ceramic and obsidian were collected from the ground surface. Furthermore, test pits were dug to confirm the data obtained from the land survey and surface collection. As a result of these efforts, a massive amount of data was collected, and ceramic and obsidian workshops were located.

In the 1980s, research centered on the "Ciudadela" and the Feathered Serpent Pyramid. In the 1980-82 research by the National Institute of Anthropology and History (INAH), large-scale excavation of the "Ciudadela" and excavation and restoration of the Feathered Serpent Pyramid were carried out [Cabrera, Rodriguez and Morelos 1982]. Between 1988-89, both the inside and around the Feathered Serpent Pyramid were excavated as part of joint projects between INAH and Brandeis University, and Arizona State University. Consequently, 25 burials, including a total of 137 burials, were found. Saburo Sugiyama interpreted the offerings, burial styles, and pyramid sculptures, indicating the Feathered Serpent Pyramid was built around AD 200 as a symbol of militaristic royal authority [Sugiyama 1989, 2000]. Using these results, Sugiyama identifies the following two points as unresolved issues [Sugiyama 2000: 31];

The Feathered Serpent Pyramid was constructed around AD 200. This corresponds to the time when the basic structures of urban planning, observable today, were constructed, and probably when the state polity was established, and some long-distance exchanges began. However, buildings before the polity formation or its early stage, around the Patlachique and Tzacualli phases according to the ceramic-type chronology, have not been found.

The religious significance and functions of the Feathered Serpent Pyramid and the "Ciudadela" have been clarified; but the issues such as how these monuments related to other monuments and how these relations transformed, remain unanswered.
At the Sun Pyramid, the back (east) and north sides of the pyramid were excavated and restored by the INAH between 1990-92 [Matos 1995]. Unfortunately, materials about the temple presumed to have been on the pyramid top do not exist, and traces of burials or offerings have not been found inside the pyramid. Sugiyama argues the following points as issues of the Sun Pyramid. [Sugiyama 2000: 30]:

There are almost no materials indicating what the Sun Pyramid was dedicated to, how it functioned, or what symbolic form it had.

The monument, as currently observed, falls into the Tzacualli phase based on the ceramic chronology, but there is only one radiocarbon analysis sample for its absolute age (AD 1-150).,
It does not go beyond the realm of conjecture about how long the Sun Pyramid functioned because the scarcity of early buildings in Teotihuacan hampers the study to associate the ceramic phases to the buildings. This is a fundamental issue which needs to be reexamined.

As mentioned earlier, the Sun Pyramid, a principal monument of the city, was excavated and restored on all four sides,

but the current interpretation of the fundamental issues, such as its architectural history, significance, and functions, is poorly-supported by data.

As explained, there are many issues regarding the monuments of Teotihuacan; however, the monument whose structure and functions are completely unknown is the Moon Pyramid .

2-2. Archaeological projects of the Moon Pyramid

Research of the Moon Pyramid was limited only to the project by Mexico's National Institute of Anthropology and History (INAH) in the 1960s; excavation and restoration of the entire area of the "Plaza of the Moon," and the surface excavation and restoration of the front and parts of the sides of the Moon Pyramid and the adjunct platform called Adosada. As a result, the Moon Pyramid was determined to be an early-Tlamimilolpa (AD 200-300) monument; however, no documentation has been found indicating that excavation was carried out inside the pyramid, or whether it took the present shape as a result of a one-time construction or after several restorations [Sugiyama 2000].

Excavation at the Moon Pyramid started in 1998 with the U.S. government's scientific research funds under the co-direction of Saburo Sugiyama of Aichi Prefectural University and Ruben Cabrera of Mexico's INAH. Since 2000, the Japanese government has granted scientific research subsidiaries. The purpose of this project was to historically restore the ancient city's origin and the formation mechanism of the complex society. In that sense, the Moon Pyramid, located in the center of the city, is the most appropriate structure for elucidating the origin of the city of Teotihuacan [Sugiyama 2000].

During the project, excavation of the Moon Pyramid through a tunnel dug inside the pyramid as well as surrounding structures and the "Plaza of the Moon" was carried out. The excavation through the inside tunnel revealed the pyramid had been rebuilt and expanded seven times.

Inside the pyramid, several sacrificial burials were found that were associated with each building. From Burial 2, associated with Building 4, a human skeleton with its hands tied from behind, and many offerings and sacrificed animals were found. Offerings include ceramic, jade products, earrings, beads, figures, obsidian products (arrowheads, ceremonial knives, stone blades, figures), shell products, and pyrite mirrors. Sacrificed animals include jaguars, pumas, wolves, snakes, eagles, and owls. These animals were depicted in the iconography of the Teotihuacan as symbols of the king's power and warriors. From Burial 6, below the top surface of the building, 12 sacrificial skeletons (of which 10 had no head) were found together with offerings and sacrificed animals [Sugiyama 2000, Sugiyama and López 2007].

From Burial 3, associated with Building 5, three human skeletons in an extended position and one in a flexed position were found. They are considered sacrificial bodies dedicated to the renovation of Building 5, because all four skeletons were buried with their hands tied behind their backs. Among the offerings of Burial 3 are obsidian products such as arrowheads, stone blades, and human figures, and shellfish products such as beads, pendants, and snails, and greenstone products such as beads, pendants, human figures, ear ornaments, and headdresses. These are considered ritualistic goods and ornaments [Sugiyama 2000, Sugiyama and López 2007].

Seventeen skull-only burials were found in Burial 4, associated with Building 6. The placement of the skulls indicated no clear pattern [Sugiyama and López 2007]. With respect to skull gender, 15 individuals out of 17 appear to be male, and two were unknown. Their ages ranged widely from 14 to 50 years old [Spence and Perira 2007]. In addition, an isotope analysis of the skulls points to the possibility that these individuals were from various regions other than Teotihuacan [White et. al. 2007]. From Burial 5 built on the floor of the top of Building 6, a sacrificial burial of three noble males, including one with a jade pendant worn by a noble Maya, was found. This was a significant finding that suggests a connection between the Teotihuacan and the Maya civilizations [Sugiyama and López 2007].

The author has been involved in the above project since 1999 and was responsible for analyzing the ceramic. As described above, the Moon Pyramid was rebuilt six times; therefore, ceramic excaveted from the earth filling of each building presents data that can be interpreted in association with the building.

3. Construction date of the Moon Pyramid

3-1. Chronology of the Teotihuacan

For the Teotihuacan time blocks, as shown in Table1, phases with some dating variation were proposed by Müller [Müller 1978], Smith [Smith 1987], Rattray [Rattray 2001], and Cowgill [Cowgill 2015] as well as various theories about the ceramic phases and their corresponding absolute years.

The tunnel excavation that began in 1998 confirmed that the Moon Pyramid was rebuilt in seven different phases. What's called the Moon Pyramid is the building constructed during the last seventh phase (Fig. 3).

The phase of each building in the Moon Pyramid is examined from the perspective of ceramic analysis. As the ceramics excavated from the building are usually from multiple phases, the phase is determined by examining the characteristics, the

Table 1: Teotihuacan Phases

	Muller 1978	Smith 1987	Rattray 2001	Cowgill 2015
Patlachique phase	150-100 B.C.	100-1 B.C.	150-1 B.C	100-1 B.C.
Early Tzacualli phase	100-1 B.C.	A.D. 1-100	(Early)	A.D. 1-100
Late Tzaucualli phase	A.D. 1-150	A.D. 100-150	A.D. 1-150 (Late)	
Miccaotli phase	A.D. 150-200	A.D. 150-250	A.D. 150-200	A.D. 100-170
Early Tlamimilolpa phase	A.D. 200-300	A.D. 250-375	A.D. 200-250	A.D. 170-250
Late Tlamimilolpa phase	A.D. 300-450	A.D. 375-450	A.D. 250-350	A.D. 250-350
Early Xolalpan phase	A.D. 450-550	A.D. 450-650	A.D. 350-450	A.D. 350-450
Late Xolalpan phase	A.D. 550-650		A.D. 450-550	A.D. 450-550
Metepec phase	A.D. 650-750		A.D. 550-650	A.D. 550-650

(Source: Muller 1978, , Smith 1987, Rattray 2001, Cowgill 2015)

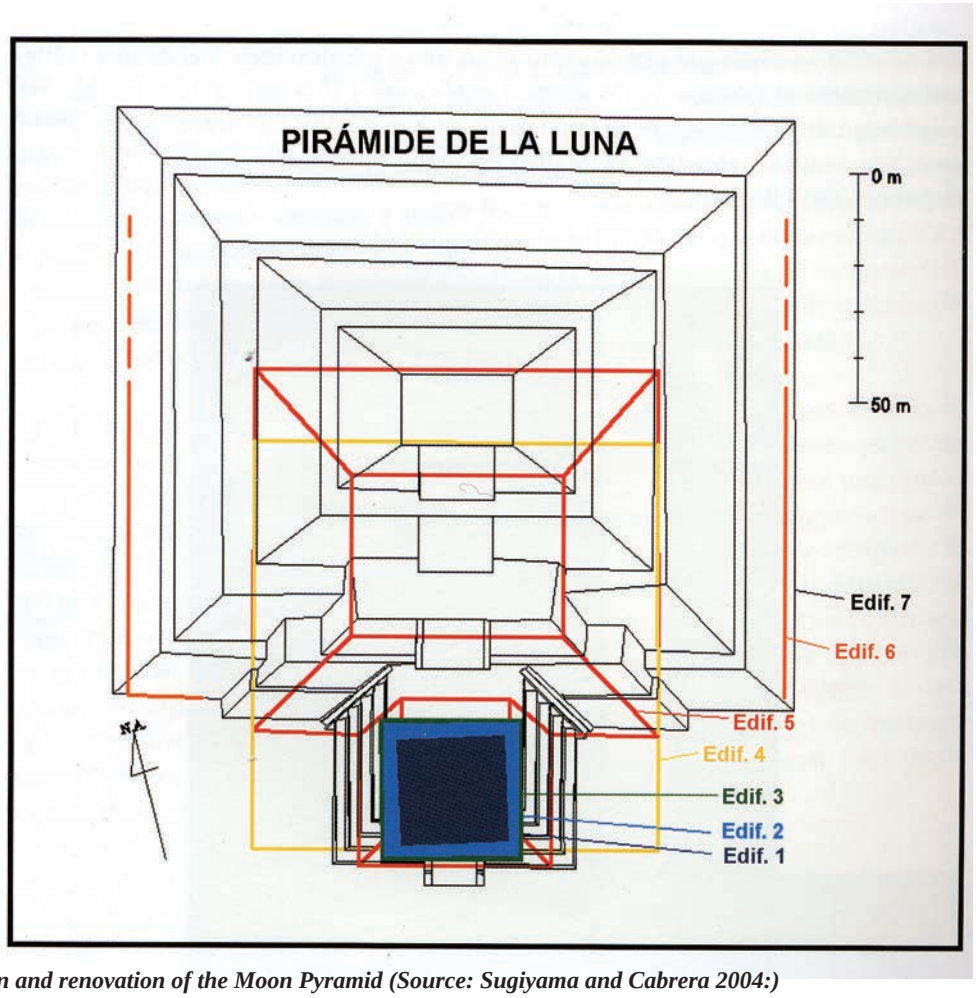

Fig. 3: Expansion and renovation of the Moon Pyramid (Source: Sugiyama and Cabrera 2004:)
(Note:Edif. 1 indicates Building 1, Edif. 2 indicates Building 2, Edif. 3 indicates Building 3, Edif. 4 indicates Building 4, Edif. 5 indicates Building 5, Edif. 6 indicates Building 6, and Edif. 7 indicates Building 7)

number of excavated pieces, and the radiocarbon date of the ceramics from the most recent phase. In addition, ceramic analytical data presented by Sugiyama et al. is used as comparative data[4] [Sugiyama and Cabrera 2007: Table 1 and Table 2].

3-2. Dating the buildings

(1) Stratum 56

This stratum appears to be a natural sedimentary layer immediately above the natural ground and on which Building 1 is located (Fig. 4).

Among the ceramics excavated from Stratum 56, which is the stratum directly above the natural ground, 88.7% are from the Patlachique phase and 8.8% from the Tzacualli phase (Table 2). Ceramics from the Patlachique phase (n=141) consist of Matte Ware (2.1%), Burnished Ware (51.8%), Polished Ware (22.0%), and Painted Ware (24.1%). This ratio is almost the

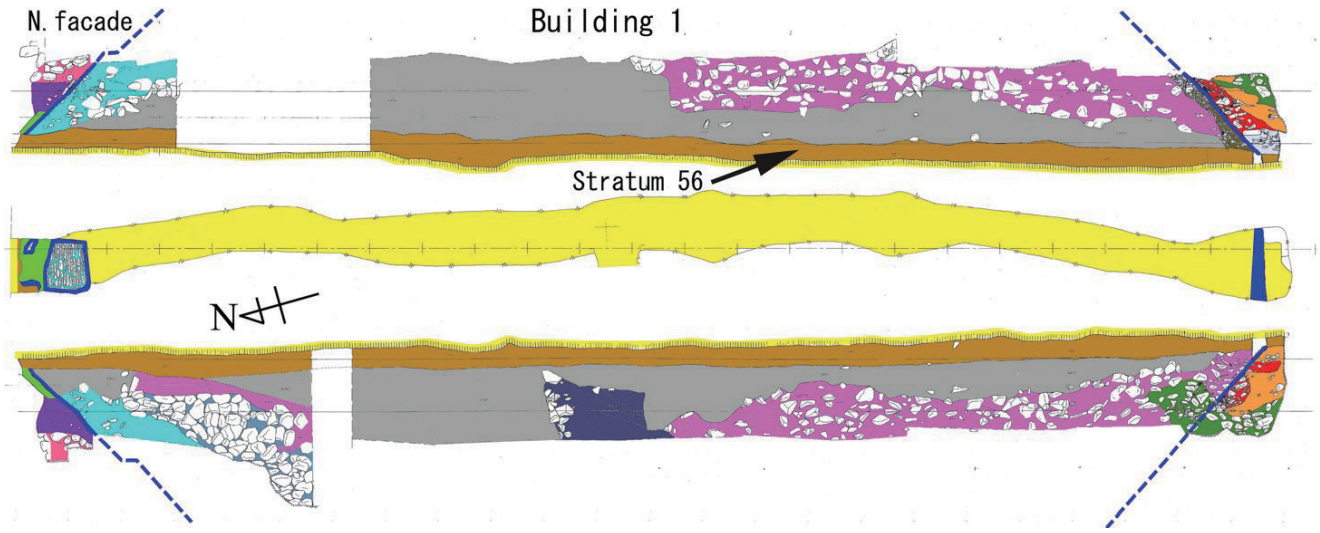

Fig.4: Stratum 56 (Provided by Dr. Saburo Sugiyama)

Table 2: Composition of ceramics excavated from Stratum 56 by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 56 (T1)	98	90,7%	9	8,3%	0	0,0%	0	0,0%	1	0,9%	108	100,0%
Stratum 56 (T3)	13	100,0%	0	0,0%	0	0,0%	0	0,0%	0	0,0%	13	100,0%
Stratum 56 (T4)	29	78,4%	5	13,5%	0	0,0%	0	0,0%	3	8,1%	37	100,0%
Stratum 56 (T5)	1	100,0%	0	0,0%	0	0,0%	0	0,0%	0	0,0%	1	100,0%
Total	141	88,7%	14	8,8%	0	0,0%	0	0,0%	4	2,5%	159	100,0%

Note: Each excavation site is called “Tunnel” (henceforth, T) with its number attached to it (e,g., T1, T2, etc.)

same as that over the entire Patlachique phase.

On the other hand, all 14 ceramic sherds from the Tzacualli phase belong to the Burnished Ware(monochrome brown group), and are identified as olla, jars, bowls, and basins.

(2) Building 1

The composition ratio of ceramics excavated from Building 1, the oldest structure in the Moon Pyramid, by phase is 94.3% from the Patlachique phase and 4.3% from the Tzacualli phase, with no ceramics excavated from the Miccaotli or the Tlamimilolpa phases (Table 3). Ceramics from the Patlachique phase (n=197) consist of Matte Ware (1.0%), Burnished Ware (26.9%), Polished Ware (44.7%), and Painted Ware (27.5%). The ratio of Polished Ware is higher than that from the entire Patlachique phase.

The 9 ceramic sherds from the Tzacualli phase are Burnished Ware (ollas and jars), Matte Ware (miniature ceramic), Polished Ware (floreros), and Thin Orange Ware (bowls). Rattray reported that fine matte group miniature ceramics and Thin Orange Ware bowls appeared in the Tzacualli phase [Rattray 2001:125-127, 139-144],

In comparison, the ceramic analysis by Sugiyama et al. shows that 96.52% is from the Patlachique phase, 2.49% from the Tzacualli phase, 0.02% from the Miccaotli phase, and 0.46% from the early Tlamimilolpa phase. The radiocarbon dating indicates AD 100 ± 50 years [Sugiyama and Cabrera 2007: 116]. Although Cowgill suggests the possibility of Building 1 as a Patlachique structure [Cowgill 2015: 55, 83, Table 6.1], the author considers it to be an early Tzacualli phase structure. Building 1 was built on top of Stratum 56, the stratum directly above the natural ground. Therefore, soil from Stratum 56 must have been used for the fill. The composition ratio of the ceramics from Stratum 56 is 89.3% from the Patlachique phase, 8.8% from the Tzacualli phase, and none from the Miccaotli or the Tlamimilolpa phases. As the ceramics excavated from Stratum 56 and Building 1 are similar in terms of the composition ratio by phase, both Stratum 56 and Building 1 are considered to date to the Tzacualli phase.

Building 1 is the oldest among the buildings of the Moon Pyramid, and its east axis is shifted three degrees to the north from the common east and west axes of the Teotihuacan buildings [Sugiyama 2000]. Therefore, Building 1 is considered to be of an earlier date than the urban construction of Teotihuacan that is observed today.

(3) Building 2

The composition ratio of ceramics excavated from Building 2 is 67.2% from the Patlachique phase, 28.9% from the Tzacualli phase, and 3.4% from the Miccaotli phase (Table 4). Ceramics from the Patlachique phase (n=460) consist of Matte Ware

Table3: Composition of ceramics excavated from Building 1 by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 56 Stratum 79,(T3)	107	97,3%	2	1,8%	0	0,0%	0	0,0%	1	0,9%	110	100,0%
Stratum 79, (T3)	47	92,2%	3	5,9%	0	0,0%	0	0,0%	1	2,0%	51	100,0%
Stratum 79 Stratum 80, (T3)	43	89,6%	4	8,3%	0	0,0%	0	0,0%	1	2,1%	48	100,0%
Total	197	94,3%	9	4,3%	0	0,0%	0	0,0%	3	1,4%	209	100,0%

Table 4: Composition of ceramics excavated from Building 2 by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 52 (T1)	4	25,0%	11	68,8%	1	6,3%	0	0,0%	0	0,0%	16	100,0%
Stratum 52,53 (T1)	180	67,7%	75	28,2%	11	4,1%	0	0,0%	0	0,0%	266	100,0%
Stratum 52,53ab (T1)	57	65,5%	27	31,0%	1	1,1%	0	0,0%	2	2,3%	87	100,0%
Stratum 52,53,56 (T1)	44	73,3%	14	23,3%	2	3,3%	0	0,0%	0	0,0%	60	100,0%
Stratum 53 (T1)	20	74,1%	5	18,5%	2	7,4%	0	0,0%	0	0,0%	27	100,0%
Stratum 52,53,56 (T2)	19	86,4%	2	9,1%	1	4,5%	0	0,0%	0	0,0%	22	100,0%
Stratum 52,53,58,59 (T2)	6	85,7%	1	14,3%	0	0,0%	0	0,0%	0	0,0%	7	100,0%
Stratum 52,53 (T4)	96	64,0%	49	32,7%	3	2,0%	0	0,0%	2	1,3%	150	100,0%
Stratum 52,53,89 (T4)	34	68,0%	14	28,0%	2	4,0%	0	0,0%	0	0,0%	50	100,0%
Total	460	67,2%	198	28,9%	23	3,4%	0	0,0%	4	0,6%	685	100,0%

Table 5: Composition of ceramics excavated from Building 3 by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 14a (T1)	5	20,8%	14	58,3%	5	20,8%	0	0,0%	0	0,0%	24	100,0%
Stratum 68 (T2)	3	23,1%	8	61,5%	0	0,0%	0	0,0%	2	15,4%	13	100,0%
Total	8	21,6%	22	59,5%	5	13,5%	0	0,0%	2	5,4%	37	100,0%

(0.2%), Burnished Ware (43.5%), Polished Ware (20.7%), and Painted Ware (34.5%). This ratio is similar to ceramics from the entire Patlachique phase.

Ceramics from the Tzacualli phase (n=198) consist of Matte Ware (2.0%), Burnished Ware (84.8%), Polished Ware (8.1%), Painted Ware (4.5%), Dense Ware (0.0%), Thin Orange Ware (0.0%), and Granular Ware (0.5%). The ratio of Burnished Ware is higher than that from the entire Tzacualli phase.

The ceramics from the Miccaotli phase (n=23) consist of Burnished Ware (4.3%) and Polished Ware (95.7%), with the majority of the Polished Ware being bowls. No ceramics from the Tlamimilolpa phase were excavated.

In comparison, the ceramic analysis by Sugiyama et al. shows that 36.75% is from the Patlachique phase, 54.57% from the Tzacualli phase, 8.46% from the Miccaotli phase, and none from the Tlamimilolpa phase or later. Radiocarbon dating indicates AD 150 ± 50 years[(Sugiyama and Cabrera 2007: 117]. Building 2 is considered to be an early Miccaotli phase structure.

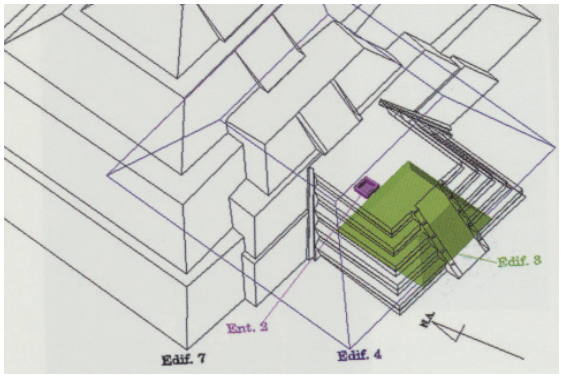

Fig. 5: Building 3 and Building 4 (Source: Sugiyama and Cabrera 2004:)

(4) Building 3

The composition ratio of the ceramics excavated from Building 3 is 21.6% from the Patlachique phase, 59.5% from the Tzacualli phase, and 13.5% from the Miccaotli phase (Table 5). Ceramics from the Patlachique phase (n=8) consist of Burnished Ware (62.5%), Polished Ware (25.0%), and Painted Ware (12.5%). Ceramics from the Tzacualli phase (n = 22) consist of Matte Ware (4.5%), Burnished Ware (9.1%), Polished Ware (68.1%), Painted Ware (18.1%).

Ceramics from the Miccaotli phase (n = 5) consist of Burnished Ware (20.0%), Polished Ware (80.0%), and no ceramics from the Tlamimilolpa phase were excavated.

In comparison, the ceramic analysis by Sugiyama et al. is not reported due to the small number of ceramics excavated. The radiocarbon dating indicates AD 225 [Sugiyama and Cabrera 2007: 117]. The above suggests that Building 3 is an early Miccaotli phase structure.

Building 2 and Building 3 were constructed by expansion

Table 6: Composition of ceramics excavated from Building 4 (upper part) by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 72 (T12)	5	6,5%	42	54,5%	30	39,0%	0	0,0%	0	0,0%	77	100,0%
Stratum 62 (T12)	3	5,0%	36	60,0%	21	35,0%	0	0,0%	0	0,0%	60	100,0%
Stratum 41 (T12)	22	14,1%	46	29,5%	88	56,4%	0	0,0%	0	0,0%	156	100,0%
Stratum 29 (T12)	12	6,9%	69	39,9%	91	52,6%	0	0,0%	1	0,6%	173	100,0%
Stratum 51,54(T12)	2	3,3%	31	50,8%	25	41,0%	0	0,0%	3	4,9%	61	100,0%
Total	44	8,3%	224	42,5%	255	48,4%	0	0,0%	4	0,8%	527	100,0%

Table 7: Composition of ceramics excavated from Building 4 (lower part) by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 73 (T2)	0	0,0%	8	100,0%	0	0,0%	0	0,0%	0	0,0%	8	100,0%
Stratum 71a (T2)	0	0,0%	27	93,1%	1	3,4%	0	0,0%	1	3,4%	29	100,0%
Stratum 82 (T2)	0	0,0%	4	100,0%	0	0,0%	0	0,0%	0	0,0%	4	100,0%
Mixed Stratum (T2)	1	16,7%	5	83,3%	0	0,0%	0	0,0%	0	0,0%	6	100,0%
Stratum 149 (T2)	131	19,0%	551	79,9%	8	1,2%	0	0,0%	0	0,0%	690	100,0%
Stratum 142 (T2)	23	9,1%	201	79,1%	30	11,8%	0	0,0%	0	0,0%	254	100,0%
Total	155	15,6%	796	80,3%	39	3,9%	0	0,0%	1	0,1%	991	100,0%

Table 8: Composition of ceramics excavated from Building 5 by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 248 (T2)	7	18,9%	27	73,0%	3	8,1%	0	0,0%	0	0,0%	37	100,0%
Stratum 254 (T2)	9	34,6%	16	61,5%	1	3,8%	0	0,0%	0	0,0%	26	100,0%
Stratum 251 (T2)	1	5,3%	12	63,2%	6	31,6%	0	0,0%	0	0,0%	19	100,0%
Stratum 254a (T2)	12	13,6%	49	55,7%	25	28,4%	2	2,3%	0	0,0%	88	100,0%
Stratum 247 (T2)	1	4,8%	11	52,4%	8	38,1%	1	4,8%	0	0,0%	21	100,0%
Stratum 247,248 (T2)	0	0,0%	12	66,7%	5	27,8%	1	5,6%	0	0,0%	18	100,0%
Stratum 257 (T2)	0	0,0%	1	100,0%	0	0,0%	0	0,0%	0	0,0%	1	100,0%
Stratum 258 (T2)	0	0,0%	4	66,7%	2	33,3%	0	0,0%	0	0,0%	6	100,0%
Stratum 260 (T2)	0	0,0%	1	100,0%	0	0,0%	0	0,0%	0	0,0%	1	100,0%
Stratum 252 (T2)	0	0,0%	0	0,0%	0	0,0%	0	0,0%	0	0,0%	0	0,0%
Stratum 254, 255 (T2)	1	33,3%	2	66,7%	0	0,0%	0	0,0%	0	0,0%	3	100,0%
Stratum 254-257 (T2)	0	0,0%	2	100,0%	0	0,0%	0	0,0%	0	0,0%	2	100,0%
Mixed Stratum (T2)	0	0,0%	0	0,0%	0	0,0%	0	0,0%	0	0,0%	0	0,0%
Total	31	14,0%	137	61,7%	50	22,5%	4	1,8%	0	0,0%	222	100,0%

and reconstruction, thereby covering Building 1 (Fig. 5). Since these buildings are small, they are considered to pre-date the urban construction of Teotihuacan, along with Building 1.

(5) Building 4

In Building 4, ceramics were excavated from two tunnels: Tunnel 12 in the upper part of the building, and Tunnel 2 in the lower part of the building.

The composition ratio of the ceramics in the upper part is 8.3% from the Patlachique phase, 42.5% from the Tzacualli phase, and 48.4% from the Miccaotli phase. On the other hand, the composition ratio of ceramics in the lower part is 15.6% from the Patlachique phase, 80.3% from the Tzacualli phase, and 3.9% from the Miccaotli phase, showing a difference in the ratio between the upper and lower part of the building. No ceramics from the Tlamimilolpa phase were excavated from either upper or lower part (Table 6, Table 7).

Ceramics from the Patlachique phase (n=199, the total from upper and lower parts; and similarly below) consist of Matte Ware (0.5%), Burnished Ware (44.7%), Polished Ware (19.6%), and Painted Ware (35.2%). This ratio is similar to ceramics from the entire Patlachique phase.

Ceramics from the Tzacualli phase (n=1020) consist of Matte Ware (23.3%), Burnished Ware (29.1%), Polished Ware (31.6%), Painted Ware (14.0%), Dense Ware (1.8%), and Thin Orange Ware (0.3%). The ratio of Matte Ware is high because many fine mate group cover plates have been excavated from the lower part of Building 4.

Ceramics from the Miccaotli phase (n=294) consist of Matte Ware (3.0%), Burnished Ware (7.8%), Polished Ware (74.9%), Painted Ware (8.9%), Dense Ware (3.7%), and Thin Orange Ware (1.7%), showing a higher ratio of Polished Ware. The majority of Polished Ware are bowls.

In comparison, the ceramic analysis by Sugiyama et al. (Tunnel 2) shows that 7.21% is from the Patlachique phase, 86.61% from the Tzacualli phase, 1.82% from the Miccaotli phase, 0.01% from the early Tlamimilolpa phase, and none from the late Tlamimilolpa phase or later. The radiocarbon dating in-

Table 9: Composition of ceramics excavated from Building 6 (upper part) by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 9 (T8E1)	4	10,3%	20	51,3%	11	28,2%	3	7,7%	1	2,6%	39	100,0%
Stratum 9 (T8N1)	32	10,9%	106	36,1%	99	33,7%	56	19,0%	1	0,3%	294	100,0%
Stratum 9,13 (T8N1)	14	7,7%	66	36,5%	60	33,1%	41	22,7%	0	0,0%	181	100,0%
Stratum 9 (T8E2)	11	10,1%	39	35,8%	38	34,9%	19	17,4%	2	1,8%	109	100,0%
Stratum 20,21 (T8E2)	5	13,9%	10	27,8%	10	27,8%	10	27,8%	1	2,8%	36	100,0%
Stratum 21 (T8E2)	3	5,2%	17	29,3%	30	51,7%	7	12,1%	1	1,7%	58	100,0%
Stratum 22,23 (T8E2)	4	4,4%	14	15,6%	34	37,8%	36	40,0%	2	2,2%	90	100,0%
Stratum 23 (T8E2)	7	7,1%	22	22,4%	26	26,5%	43	43,9%	0	0,0%	98	100,0%
Total	80	8,8%	294	32,5%	308	34,0%	215	23,8%	8	0,9%	905	100,0%

Table 10: Composition of ceramics excavated from Building 6 (lower part) by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 280b (T2)	0	0,0%	17	20,2%	25	29,8%	41	48,8%	1	1,2%	84	100,0%
Stratum 284 (T2)	1	7,1%	5	35,7%	2	14,3%	6	42,9%	0	0,0%	14	100,0%
Total	1	1,0%	22	22,4%	27	27,6%	47	48,0%	1	1,0%	98	100,0%

dicates AD 250 ± 50 years [Sugiyama and Cabrera 2007: 120]. Although the radiocarbon date is later than the Miccaotli phase, Building 4 is still considered to be a Miccaotli phase structure based on the ceramic composition.

The scale of expansion and reconstruction of Building 4 was vastly different from that of the previous three buildings, at about nine times the base area (Fig.3). In addition, Burial 2 and Burial 6[5], serving as sacrificial burial sites, were discovered in this building [Sugiyama and López 2007]. The presence of offerings and sacrificial victims in these burial sites suggests that a funeral ritual was performed during the building's construction, and that there was an individual with sufficient power to command the ritual performance and provide goods for a ritual burial [Sugiyama and López 2007: 141].

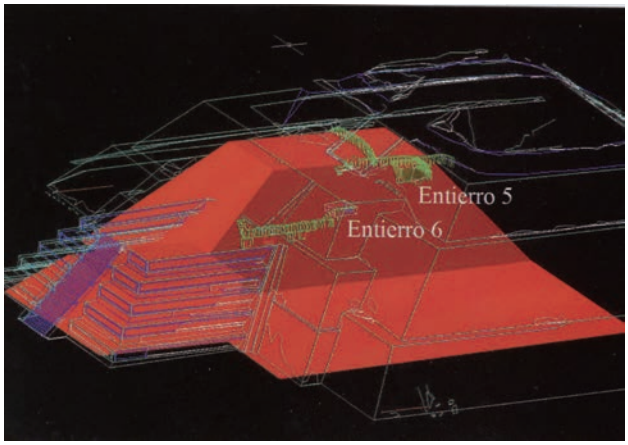

Fig. 6: Burial 5 and Burial 6 of the Moon Pyramid (Source: Sugiyama and Cabrera 2004:)

(6) Building 5

The composition ratio of ceramics in Building 5 is 14.0% from the Patlachique phase, 61.7% from the Tzacualli phase, 22.5% from the Miccaotli phase, and 1.8% from the Tlamimilolpa phase (Table 8). Ceramics from the Patlachique phase (n=31) consist of Burnished Ware (51.6%), Polished Ware (9.7%), and Painted Ware (38.7%).

Ceramics from the Tzacualli phase (n=137) consist of Matte Ware (1.5%), Burnished Ware (41.6%), Polished Ware (29.9%), Painted Ware (34.8%), and Dense Ware (2.2%). The ratio of Painted Ware is higher than that from the entire Tzacualli phase. Ceramics from the Miccaotli phase (n=50) consist of Matte Ware (2.0%), Burnished Ware (10.0%), Polished Ware (60.0%), Painted Ware (20.0%), Dense Ware (4.0%), and Thin Orange Ware (4.0%).

Ceramics from the Tlamimilolpa phase (n=4), which were excavated for the first time from the fill of Building 5, consist of one sherd each of Matte Ware, Burnished Ware, Polished Ware, and Dense Ware.

In comparison, the ceramic analysis by Sugiyama et al. (Tunnel 2) shows that 5.18% is from the Patlachique phase, 71.05% from the Tzacualli phase, 19.81% from the Miccaotli phase, 2.83% from the early Tlamimilolpa phase, and none from the late Tlamimilolpa phase or later. The radiocarbon date is AD 300 ± 50 years [Sugiyama and Cabrera 2007: 121]. The above suggests that Building 5 was constructed during the Tlamimilolpa phase.

The architectural style of Building 5 changed significantly. The adosada platform in the talud-tablero style was erected in the front of the building, giving it the same shape as the present Moon Pyramid. Burial 3, serving as a sacrificial burial site for this building, contained four human skeletons wearing noble burial accessories and with their hands tied behind their backs [Sugiyama and López 2007: 130-131].

Table 11: Composition of ceramics excavated from Building 7 by phase

Stratum	Patlachique Phase (No. of Rims)		Tzacualli Phase (No. of Rims)		Miccaotli Phase (No. of Rims)		Tlamimilolpa Phase (No. of Rims)		Unidentified (No. of Rims)		Total (No. of Rims)	
Stratum 22	4	2,3%	66	37,5%	60	34,1%	46	26,1%	0	0,0%	176	100,0%
Stratum 25	0	0,0%	8	18,2%	13	29,5%	22	50,0%	1	2,3%	44	100,0%
Stratum 26	0	0,0%	14	11,2%	32	25,6%	79	63,2%	0	0,0%	125	100,0%
Total	4	1,2%	88	25,5%	105	30,4%	147	42,6%	1	0,3%	345	100,0%

(7) Building 6

In Building 6, ceramics were excavated from two tunnels: Tunnel 8 in the upper part of the building, and Tunnel 2 in the lower part of the building.

The composition ratio of the ceramics excavated from the upper part is 8.8% from the Patlachique phase, 32.5% from the Tzacualli phase, 34.0% from the Miccaotli phase, and 23.8% from the Tlamimilolpa phase. On the other hand, the composition ratio of ceramics from the lower part is 1.0% from the Patlachique phase, 22.4% from the Tzacualli phase, 27.6% from the Miccaotli phase, and 48.0% from the Tlamimilolpa phase, showing a difference in the ratio between the upper and lower parts (Table 9, Table 10).

Ceramics from the Patlachique phase (n=81, the total from upper and lower parts; and similarly below) consist of Burnished Ware (37.0%), Polished Ware (2.4%), and Painted Ware (60.5%), with a higher ratio of Painted Ware.

Ceramics from the Tzacualli phase (n=316) consist of Matte Ware (1.6%), Burnished Ware (41.8%), Polished Ware (24.4%), Painted Ware (31.3%), and Dense Ware (0.9%)..

Ceramics from the Miccaotli phase (n=335) consist of Matte Ware (0.3%), Burnished Ware (17.0%), Polished Ware (69.9%), Painted Ware (7.5%), Dense Ware (3.9%), and Thin Orange Ware (1.5%), with a high ratio of Polished Ware. The majority of the Polished Ware are bowls.

Ceramics from the Tlamimilolpa phase (n=262) consist of Matte Ware (3.0%), Burnished Ware (1.9%), Polished Ware (72.5%), Painted Ware (5.8%), Dense Ware (14.5%), and Thin Orange Ware (2.3%), with a higher ratio of Polished Ware and Dense Ware.

In comparison, the ceramic analysis by Sugiyama et al. shows that 0.7% is from the Patlachique phase, 20.8% from the Tzacualli phase, 43.1% from the Miccaotli phase, and 31.4% from the early Tlamimilolpa phase [Sugiyama and Cabrera 2007: 121]. The radiocarbon date is AD 350 ± 50 years [Sugiyama and Cabrera 2007: 120]. The above suggests that Building 6 was constructed during the Tlamimilolpa phase.

Building 6 was constructed by expanding Building 5 (Fig. 3). Burial 4 was found in the lower part of the building, and Burial 5 was found directly under the building floor in the upper part (Fig.6). The ornaments worn by the individuals buried in Burial 5 suggest that they belonged to the Maya elite class [Sugiyama and López 2007: 132-138].

(8) Building 7

The composition ratio of the ceramics from Building 7 is 1.2% from the Patlachique phase, 25.5% from the Tzacualli phase, 30.4% from the Miccaotli phase, and 42.6% from the Tlamimilolpa phase. Ceramics from the Patlachique are rarely excavated (Table 11).

Ceramics from the Tzacualli phase (n=88) consist of Matte Ware (4.5%), Burnished Ware (34.1%), Polished Ware (20.5%), Painted Ware (27.3%), Dense Ware (1.1%), and Thin Orange Ware (12.5%).

Ceramics from the Miccaotli phase (n=105) consist of Matte Ware (2.9%), Burnished Ware (14.3%), Polished Ware (75.2%), and Painted Ware (7.7%), with a high ratio of Polished Ware.

Ceramics from the Tlamimilolpa phase (n=147) consist of Matte Ware (6.1%), Burnished Ware (2.0%), Polished Ware (79.6%), Painted Ware (7.4%), Dense Ware (4.1%), and Thin Orange Ware (0.7%), with a higher ration of Polished Ware.

In comparison, the ceramic analysis by Sugiyama et al. (Front C) shows that 0.3% is from the Patlachique phase, 18.37% from the Tzacualli phase, 41.49% from the Miccaotli phase, 33.97% from the early Tlamimilolpa phase, 0.13% from the late Tlamimilolpa phase, and 1.77% from the Xolalpan phase. The radiocarbon date is AD 450 ± 50 years [Sugiyama and Cabrera 2007: 120]. Sugiyama et al.'s data do not rule out the possibility that Building 7 dates to the Xolalpan phase. However, no ceramics from the Xolalpan phase were excavated in the author's analysis of Building 7 (Stratum 22, Stratum 25, and Stratum 26), and Building 7 should be interpreted as a structure from the Tlamimilolpa phase.

4. Relationship between the Moon Pyramid with other Monuments

Table 12 shows the current hypothesis of the relationship between each building of the Moon Pyramid and the Sun Pyramid and the Feathered Serpent Pyramid . The author examines its relationship with the other monuments based on previous studies

Table 12: Relationship between the buildings of the Moon Pyramid, the Sun Pyramid, and the Feathered Serpent Pyramid

Moon Pyramid	Phase (note1)	Moon Pyramid's Radiocarbon Date (note2)	Moon Pyramid's Burial	Sun Pyramid	Feathered Serpent Pyramid (Temple of Quetzalcoatl)	Remarks (note3)
Building 1	Tzacualli Phase (A.D. 1-150)	A.D. 100±50			pre-Ciudadela	(Moon)Small Scale
Building 2	Miccaotli Phase (A.D.150-200)	A.D. 150±50		Building 1		(Moon)Small Scale
Building 3	Miccaotli Phase (A.D.150-200)	A.D. 225			pre-FSP?	(Moon)Small Scale
Building 4	Miccaotli Phase (A.D.150-200)	A.D. 250±50	Burial 2	Construction of Sun Pyramid's Corpus?	Construction of Feathered Serpent Pyramid (Temple of Quetzalcoatl)	(Moon Pyramid)Bigger Scale(Major Reconstruction)
			Burial 6			(Feathered)Advent of Powerful Ruler (Sacrifices), Emergence of Talud-tablero Style
Building 5	Early Tlamimilolpa Phase (A.D. 200-250)	A.D. 300±50	Burial 3	Construction of Adosada, Expansion and Renovation of Sun Pyramid's Corpus?	Construction of Adosada	(Moon)Major Reconstruction, Emergence of Adosada in Talud-tablero Style
Building 6	Early Tlamimilolpa Phase (A.D. 200-250)	A.D. 350±50	Burial 4			Moon)Major Reconstruction
			Burial 5			(Moon) Mayan Sacrifices
Building 7	Early Tlamimilolpa Phase (A.D. 200-250)	A.D. 450±50				(Moon)Minor Reconstruction

Note1: Rattray's chronology (Rattray 2001).

Note2: Sugiyama and Cabrera 2007

Note3: (Moon) indicates Moon Pyramid;(Feathered) indicates Feathered Serpent Pyramid.

on Teotihuacan.

Patlachique phase

The Patlachique phase settlement area was concentrated in the northwestern part of the Teotihuacan Basin (Fig.7), and the population at the time is thought to have been about 19,000 [Cowgill 1974: 381-384].

Ceramics from the Patlachique phase were excavated from Stratum 56, which is considered to be natural sediment directly above the natural ground, in the central part of the basin where the Moon Pyramid is located. This suggests there was human activity in the central part of the basin, although no construction has been confirmed.

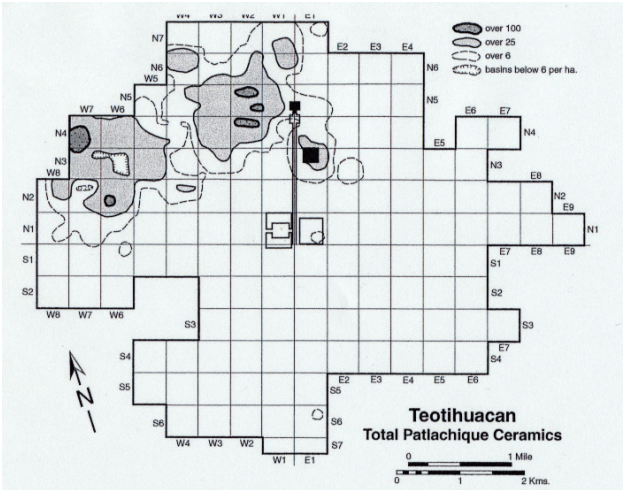

Fig. 7: Distribution of ceramics from the Patlachique phase (Source: Cowgill 2015: Fig.4.1, p.54)

Among ceramics from the Patlachique phase, many decoration techniques were used for Painted Ware, such as red-on-natural, polychrome, and negative decorations. It has been suggested that the ceramic culture with such techniques relates to the Cuicuilco archaeological site in the southern part of the Mexico basin.

Tzacualli phase

In the Tzacualli phase, the settlement area expanded, and ceramics from the Tzacualli phase are heavily distributed also in the Sun Pyramid and Ciudadela (Fig. 8). The estimated population at that time is at least 25,000 to 30,000 [Cowgill 1974: 383-385]. It is thought that the urban construction started during this time, including the Sun Pyramid.

However, the research on the Moon Pyramid does not necessarily support this theory. First, the building that belongs to the Tzacualli phase in the Moon Pyramid is Building 1. As mentioned earlier, it is reported that the east axis of Building 1 is skewed by 3 degrees to the north from the commonly known east-west axis of Teotihuacan buildings [Sugiyama 2000: 39]. According to the report on the pre-Ciudadela structure[6], its axis is unaligned from the reference axis of Teotihuacan, as is the case with Building 1. Therefore, these two structures are considered to predate the present urban construction. This means that

in the Tzacualli phase, the center of Teotihuacan consisted of the small Building 1[7] of the Moon Pyramid to the north and the pre-Ciudadela structure to the south (Fig.9).

The Sun Pyramid may have been built at a later date than previously thought.[8] If this hypothesis is correct, a powerful ruler who could build a large monument had not yet emerged by the Tzacualli phase, and the society of the Patlachique phase continued to develop gradually and brought about population growth. The ceramics inherited the tradition of the Patlachique phase, and although the pastes are different, there are many similarities in the rims and lips of the Burnished Ware's ollas. The pastes changed significantly for Polished Ware and Painted Ware, and red-on-natural, polychrome, and negative decorations were refined remarkably. The addition of Granular Ware and Thin Orange Ware, which are thought to have been brought from other regions, suggests an increased number of regions interacting, and the ceramic culture that had developed since the Patlachique phase reached its peak.

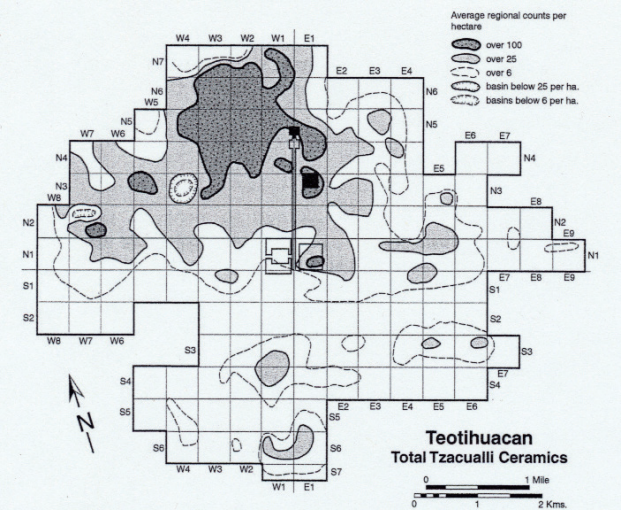

Fig.8: Distribution of ceramics from the Tzacualli phase (Source: Cowgill 2015: Fig.5.1, p.62)

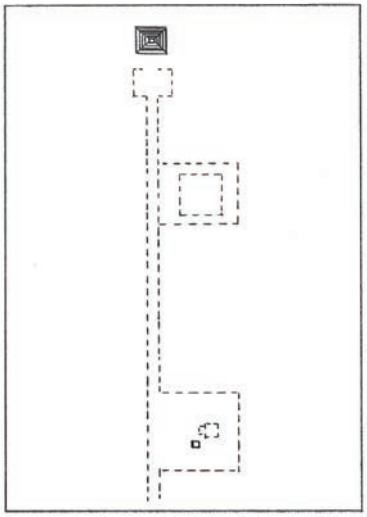

Fig. 9: Building 1 of the Moon Piramid and pre-Ciudadela in the Tzaculli phase (Conceptual figure)

Miccaotli phase

According to Cowgill, the distribution of the ceramics from the Miccaotli phase is similar to that of the Tzacualli phase, and covers an area of about 20 square kilometers throughout the Teotihuacan Basin (Fig. 10). The population is estimated to have been between 80,000 and 100,000 [Cowgill 2015: 79]. As for the construction in the central part of the basin, conventional theories suggest that the Ciudadela and the Feathered Serpent Pyramid (the Temple of Quetzalcoatl) were both built during this phase. The author examines this theory by analyzing data from recent studies about the Moon Pyramid.

First, in the Moon Pyramid, a small-scale expansion and reconstruction of Building 2 and Building 3 were carried out while covering Building 1. The orientation of these buildings gradually aligned to the reference axis of Teotihuacan. Structure 1 of the Sun Pyramid [Sugiyama, Nawa, Saburo Sugiyana, and Alejandro Sarabia G 2013] and the pre-FSP structure of the Feathered Serpent Pyramid are both contemporaneous with Building 2 and Building 3.

Next, a large-scale expansion and reconstruction took place to construct Building 4. This building is contemporaneous with the main corpus of the Sun Pyramid and that of the Feathered Serpent Pyramid. It is believed that the Avenue of the Dead was also built during this time, and the construction of Teotihuacan's central area was completed (Fig. 11). Although the construction date of the Sun Pyramid is hypothetical, at least the Feathered Serpent Pyramid and Building 4 of the Moon Pyramid are considered to be contemporaneous, and the size of these monuments and the presence of many sacrificial burial sites suggest the existence of an individual with strong power.

In the Miccaotli phase, political change took place in Teotihuacan, and, at the same time, the vibrance of the Tzacualli phase ceramics was lost. Polychrome and negative decorations of Painted Ware diminished, and many Polished Ware ceramics were appeared.

Tlamimilolpa phase

Building 5, Building 6, and Building 7 of the Moon Pyramid were constructed during the Tlamimilolpa phase. In Building 5, the adosada was built in the new architectural talud-tablero style. The adosada was built by scraping the south side of Building 4 and covering Building 1, Building 2, and Building 3. Then,

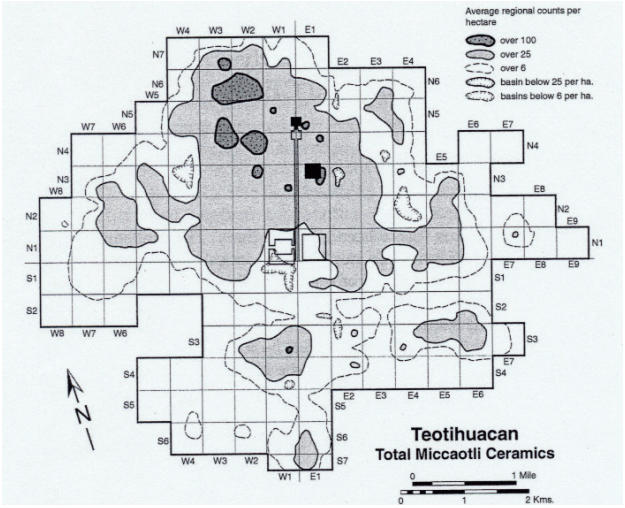

Fig. 10: Distribution of ceramics from the Miccaotli phase (Source: Cowgill 2015: Fig.6.1, p.80)

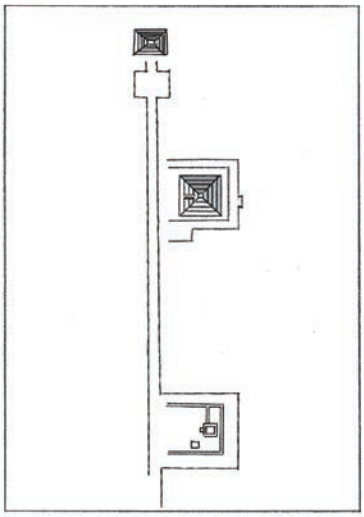

Fig.11: Building 4 of the Moon Piramid ,the Sun Piramid and Ciudadela, and the Feathered Serpent Pyramid in the Miccaotli phase (Conceptual figure)

Building 6 and Building 7 were constructed in the Moon Pyramid, following this architectural style. Adosadas were also built at the Sun Pyramid and the Feathered Serpent Pyramid (Fig. 12). In Burial 5 of Building 6, a jade pendant worn by a Mayan nobleman was found, suggesting the possibility that a nobleman related to Maya culture was sacrificed [Sugiyama and Lujan 2007].

In the central part of Teotihuacan, after the construction of Building 7 of the Moon Pyramid, there was no construction activity at these three monuments, but increasing numbers of apartment complexes were constructed along the Avenue of the Dead. The Tlamimilolpa phase ceramics excavated from the Moon Pyramid are characterized by the presence of many Polished Ware ceramics, as in the Miccaotli phase, and black cores in the paste due to firing imperfections. As no candeleros[9] or adornos (a decorative part of an incensario) have been excavated from the Moon Pyramid, both of these characterize the late Tlamimilolpa phase, the structures are considered to be dated to the early Tlamimilolpa phase.

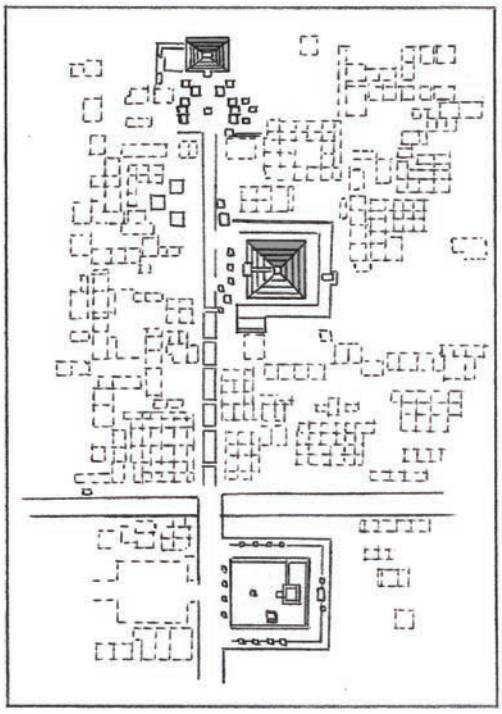

Fig. 12: Building 5,6,7 of the Moon Piramid ,the Sun Piramid and Ciudadela, and the Feathered Serpent Pyramid in the Tlamimilolpa phase (Conceptual figure)

Notes

1 This paper is a revision of a part of Sato's doctoral dissertation [Sato 2017].

2 According to the decoding of the Mayan script, an individual believed to have been one of the rulers of Teotihuacan, Siyah K'ak', "arrived" at Tikal, Guatemala in AD 378 and led a coup. Former Tikal ruler, Chak Tok Ich'aak, died in AD 378 and in AD 379, Yax Nuun Ayiin I was enthroned as the new king. On "Stela 31," Yax Nuun Ayiin I is depicted as a man dressed in a Teotihuacan-style costume. He's holding a shield and javelin with Tlaloc iconography on his hands [Schele and Freidel 1990, Martin and Grube 2000].

3 K'inich Yax K'uk' Mo' created the kingdom of Copan in Honduras, Central America, in AD 426. Researcher Robert J. Sharer discovered that the early monuments of the Copan dynasty had the Talud-tablero style structure of Teotihuacan. In addition, Teotihuacan ceramics were found among the offerings in the burials. From this it can be inferred that the first ruler of the Copan dynasty had a relationship with the

Teotihuacan [Sharer 2003].

4 Sugiyama et al. counted the total number of sherds, including body fragments, in their ceramic analysis and analyzed more strata than the author. The author counted only sherds from rims.

5 Burial 6 was initially thought to be a burial of Building 5 [Sugiyama and López 2007:14], but it is presently interpreted as a burial of Building 4.

6 Gazola reported on the pre-Ciudadela structure at a conference [Gazola 2012], but since this is not available, the author cites Cowgill's report [Cowgill 2015: 69].

7 Cowgill also considers Building 1 to be dated to the late Patlachique or early Tzacualli phase [Cowgill 2015: 55].

8 The Sun Pyramid Project (PPS), headed by Sarabia, was carried out from 2008 to 2011. During this project, the interior of the Sun Pyramid (Front C) and the subterranean "cave" beneath the Sun Pyramid (Front D) were re-examined, and three stages related to the construction of the Sun Pyramid were defined [Sugiyama et al. 2013]. The first stage pre-dates the Sun Pyramid as the small Structure 1, the second stage is the main corpus of the Sun Pyramid, and the third stage was the addition of the adosada platform to the front of the Sun Pyramid.

9 A candelero is a portable incense burner or lamp. The size is about 5 cm in height, 2 cm in width, and 5 to 6 cm in length, with two types of vessel shapes: one type has a single burner, and the other type has two.

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The Formative Heritage in Central Mexico:Proyecto Arqueológico Tlalancaleca, Puebla

Shigeru Kabata, Tatsuya Murakami, and Julieta M. López Juárez

Introduction

In Central Mexico, archaeologists look to the origins of state society at Teotihuacan, a metropolis that developed with such supremacy that its influence reached almost every corner of Mesoamerica [Braswell 2003; García-Des Lauriers and Murakami 2021; Hirth, et al. 2020]. However, what catalyst drove the rise of Teotihuacan? Tlalancaleca is a key archaeological site for answering this question given that Tlalancaleca declined as Teotihuacan gained its hegemony [García Cook 1973, 1981]. Furthermore, the Teotihuacan state did not develop in a vacuum, but was instead a product of specific historical processes that implemented accumulated knowledge and technology since earlier times [e.g., Cowgill 2015: 41-46; Plunket and Uruñuela 2012a: 33-34]. Past and recent research continue to confirm that Tlalancaleca and the Puebla-Tlaxcala Valley were key places in these processes [Carballo 2016; García Cook 1981; Lesure 2014; Murakami, et al. 2017]. In this chapter, we disentangle these processes and demonstrate that Tlalancaleca and other Formative centers were the heritage out of which later societies developed in Central Mexico.

We do so by focusing on the cultural elements inherited by Teotihuacan, especially the worldviews materialized in the urban landscape. We define worldview as the beliefs shared by the ancient people about how the world was formed, the beings that exist in it along with their place and roles. The materialization of worldview is not a monothetic process but comprises diverse manifestations and media [e.g., DeMarrais, et al. 1996]. Worldviews were often materialized by recreating the cosmos among the layout and orientation of settlements, pyramid structures, caves, and other human-made and natural features of the landscape. In Central Mexico, there seemed to be a commonly shared worldview (and a system of knowledge) in place by the Formative period at early cities like Cuicuilco, Xochitécatl, and Tlalancaleca (Figures 1 and 2). These cities developed prior to Teotihuacan and evidence suggests strong historical continuities in worldview between them and Classic and Postclassic

Figure 1. General View of the Archaeological Site of Tlalancaleca (taken from northeast).

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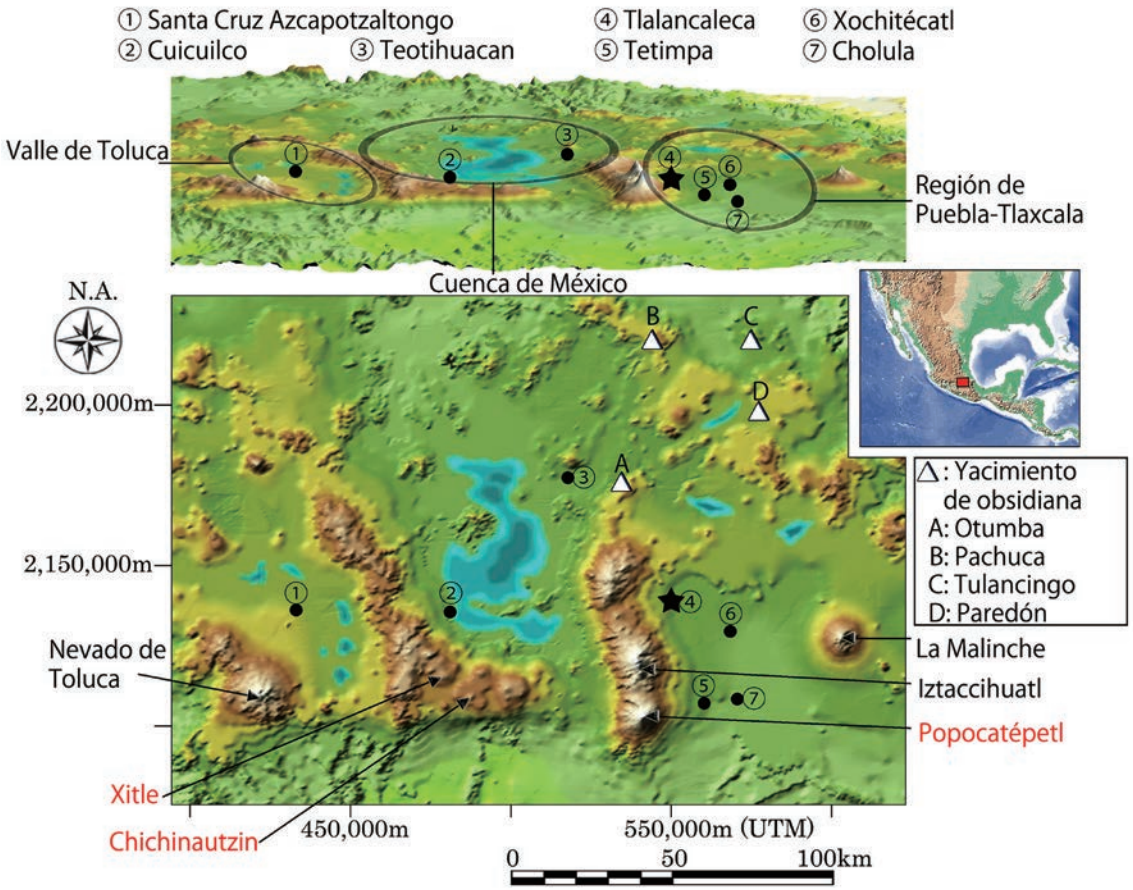

Figure 2. Map showing the location of important archaeological sites in Central Mexico.

period cities [Carballo 2016]. The production of the central authority and a corporate ideology was likely predicated on the materialized worldview at Classic Teotihuacan [Headrick 2007; Murakami 2016; Sugiyama 2005]. Therefore, paying attention to which aspects of the Formative period worldview persisted and changed is key for understanding how the Teotihuacan state emerged out of the sociopolitical and ideological processes of earlier societies. In this chapter, we provide some alternative interpretations regarding the formation of the Teotihuacan state from the perspective of historical continuity, based on the results of the Proyecto Arqueológico Tlalancaleca, Puebla (PATP).

Urbanization and State Formation at Teotihuacan: The Origins of Materialized Worldview

Why did people nucleate at Teotihuacan? How did population nucleation tie into state formation at Teotihuacan? According to previous studies, large-scale population movement was the result of volcanic eruptions by the Popocatépetl, Chichinautzin, and Xitle volcanos [e.g., López Austin and López Luján 2001: 116-126]. These eruptions occurred between the first and third centuries AD and caused, directly or indirectly, the decline and abandonment of Cuicuilco and other centers [Siebe, et al. 2004].

During the Patlachique phase (100-1 BC), Teotihuacan and Cuicuilco were incipient cities with estimated populations between 20,000 and 40,000 inhabitants [Cowgill 1974, 2003; Parsons 1974; Sanders, et al. 1979]. Given these observations, Teotihuacan and Cuicuilco have long been conceived as rival polities. The volcanic eruptions tie into this rivalry, for Teotihuacan supposedly eclipsed its rival as it incorporated refugees from the southern Basin of Mexico and the western part of the Puebla-Tlaxcala valley. Archaeologists have promoted this migratory phenomenon as the foundation of state formation at Teotihuacan [Cowgill 2015; Nichols 2016].

However, Teotihuacan was unlikely a mature state with strong political and economic bases during this time period [Murakami 2014; cf. Cowgill 2000; Millon 1981]. So, if this was the case, how would Teotihuacan have received, managed, and maintained thousands of refugees? More importantly, why would those refugees have migrated to Teotihuacan rather than other Formative centers or founding new settlements entirely? Scholars point to fertile lands, the sacred nature of place, and the city's proximity to obsidian sources and other natural resources as factors that might have attracted migrants [Cowgill 2000, 2015; Millon 1981, 1993; Sanders, et al. 1979].

That said, would not the inhabitants of Cuicuilco and other nearby areas also have sought secure and fertile lands with abundant natural resources prior to the volcanic eruptions? The problematic premise pervading discussions of this topic is that human decision-making processes depend solely on natural circumstances. Archaeological data defies this premise, indicating a need for alternatives. Take for example, the Toluca Valley, located to the west of the Basin of Mexico. It shows no substantial impact by the volcanic eruptions nor an influx of migrants and yet there was plenty of fertile land within the valley [Sugiura 2005: 315-317]. Therefore, we need to account for population nucleation at Teotihuacan with other factors besides natural environment.

Returning to Teotihuacan and Cuicuilco, there was an important difference between the Patlachique phase centers: Teotihuacan lacked comparable large-scale monumental structures to the ones found at Cuicuilco. If we take this to mean that powerful ruling elites governed at Cuicuilco while a confederation of local, autonomous communities governed at Early Teotihuacan [Angulo V. 2007; Murakami 2014], it would seem that politics/governance and socioeconomic processes accounted for immigration to the city more than natural environment [Millon 1993]. More importantly, we think that the materialized worldview would have been a major attraction to newcomers.

We argue that the worldview materialized in state/public architecture at Teotihuacan, such as the Moon and Sun Pyramids [Sugiyama 2005], had roots in earlier societies [Murakami, et al. 2017]. We see these monumental structures as signs that ancient people saw religious meaning in elements of the natural landscape, such as mountains, rivers, and caves – beliefs and a tradition of materiality that we understand to have preceded Teotihuacan in the religious practices of much earlier societies. However, there is a gap in our knowledge and data between earlier stages and the materialized worldview at Teotihuacan in Central Mexico [but see Grove 1999]. Archaeological data from Tlalancaleca are now filling this gap. We contend that it is critical to examine diachronically how worldviews were materialized to better understand early urbanization and state formation. The success of the materialized worldview at Teotihuacan owes not only to the technology and knowledge that developed in the city itself but also its cultural heritage from earlier societies.

Archaeological Site of Tlalancaleca

Tlalancaleca is located 4 km southwest of the present town of San Matías Tlalancaleca and 19 km northeast of the Iztaccíhuatl volcano. The epicenter of the site is on a plateau-like hill flanked by two gullies (approximately 2,500 m asl), locally called La Pedrera due to the abundance of rocks. La Pedrera is roughly 5.5x1.2 km (its elongated form runs along the east-west axis) and rises from 50 m to 100 m above the valley that extends east of the site (Figure 3). From this vantage point one can look across the valley bottom of the Puebla-Tlaxcala region. Access

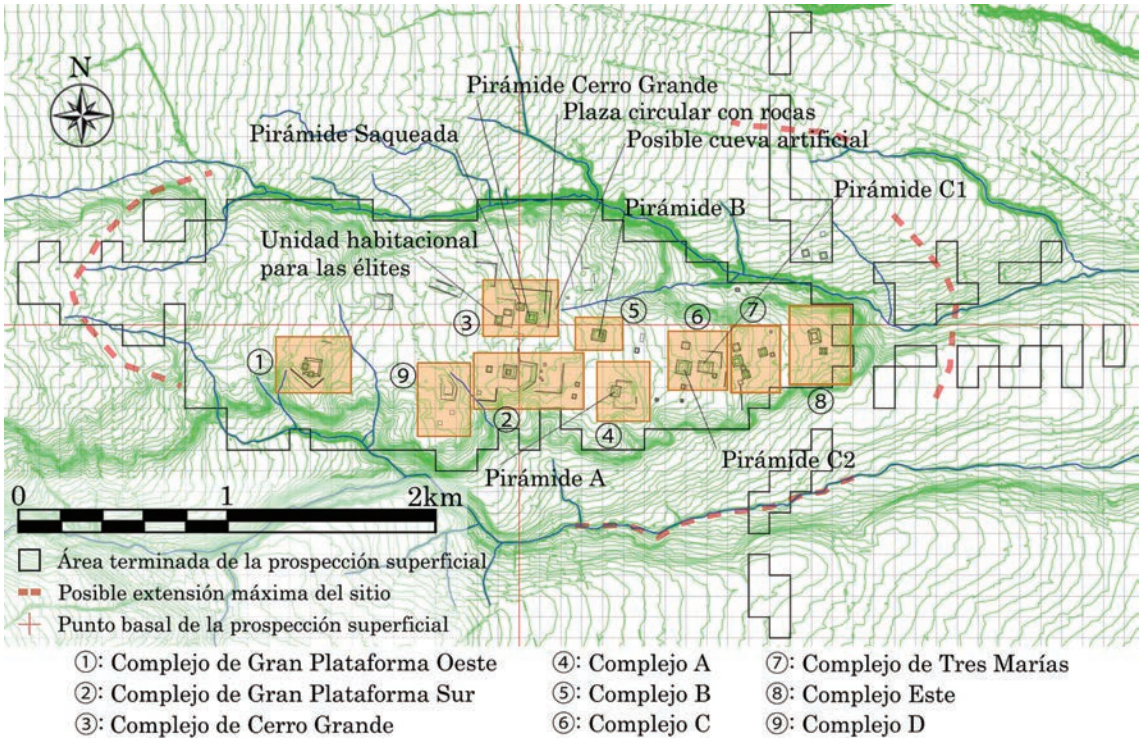

Figure 3. Map showing the location of major architectural complexes at Tlalancaleca.

to La Pedrera is difficult; gullies and ravines inhibit entry from the north and northwest, and cliffs inhibit ascent from the east and south.

Previous research [García Cook 1973, 1981] posits that Tlalancaleca was settled by sedentary inhabitants around 1200 BC (modified to 800 BC by Lesure, et al. 2014), reached its apogee around 600 or 500 BC, and was abandoned around AD 100 (Figure 4), prior to state formation at Teotihuacan. Yet, similarities or continuities in a number of cultural traits between Tlalancaleca and Teotihuacan suggest their histories were closely entwined [García Cook 1973, 1981, 1984]. These cultural elements include the talud-tablero architectural style, lime plaster (or white coating), and representations of the Old God of Fire (Huehuetéotl) (Figure 7b) and Storm God (Tláloc) (Figure 5).Given these cultural traits, the high density of monumental structures and magnitude of the site, Tlalancaleca was a major civic-cere-

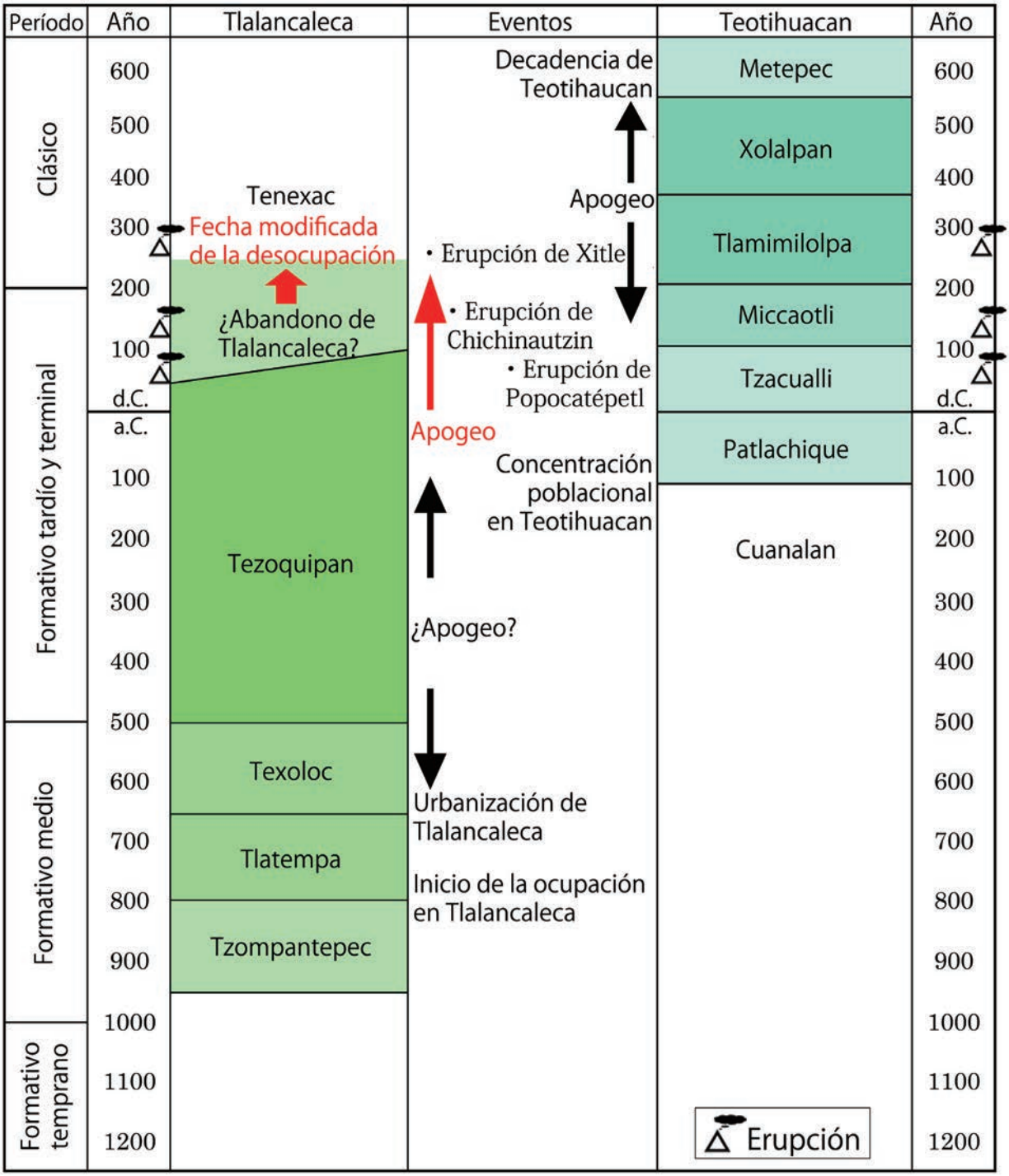

Figure 4. Chronology of Tlalancaleca and Teotithuacan.

Figure 5. Sculpture of Pre-Tláloc (the right photogrammetric image created by Ariel Texis Muñoz).

Figure 6. Stone brazier of the Old God of Fire discovered at the Sun Pyramid (photo courtesy of Alejandro Sarabia).

monial center and peer among Teotihuacan and Cuicuilco. Current evidence suggests the political, economic, and religious influence of Tlalancaleca went beyond the Puebla-Tlaxcala region. Despite its clear importance, there was no long-term archaeological project nor large-scale excavations carried out at Tlalancaleca after García Cook's Proyecto Arqueológico Puebla-Tlaxcala first drew attention to the site and conducted pilot work. We intend to rectify the gaps at Tlalancaleca through our project the Proyecto Arqueológico Tlalancaleca, Puebla [Murakami, et al.

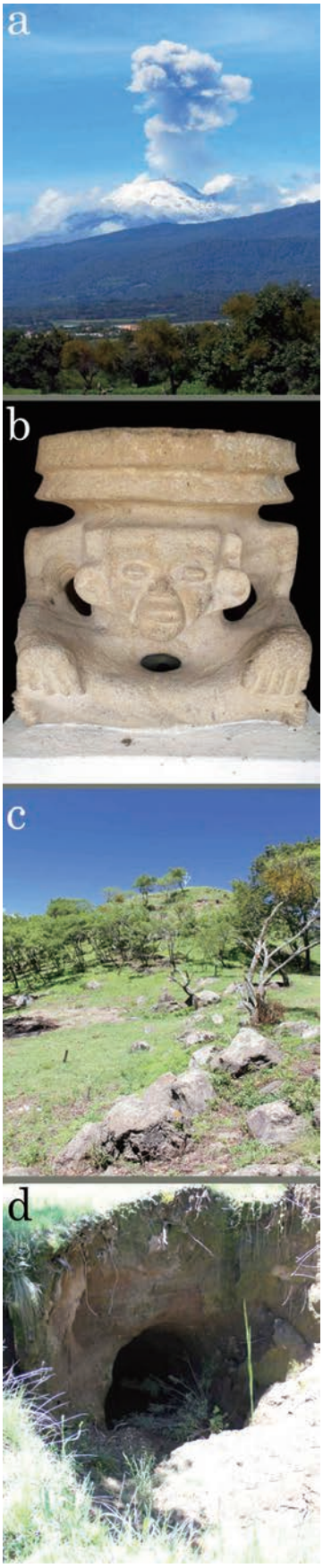

Figure 7. Vertical order (from the top, a: Popocatépetl; b: brazier with the image of the Old God of Fire; c: Cerro Grande Pyramid; d: Entrance of a possible artificial cave)

2017; Murakami, et al. 2018].

Worldview Embodied in Material Culture at Tlalancaleca

In this section, we review archaeological evidence at Tlalancaleca that suggests a degree of continuity in worldview and its materialization at Tlalancaleca and Teotihuacan. We want to draw particular attention to a verticality that characterizes this materialization in landscape and material culture. To begin, we turn to Teotihuacan's Sun Pyramid (ca. 224×223×64 m). At the top of this pyramid, inhabitants deposited a brazier dedicated to the Old God of Fire or Huehuetéotl [Sarabia González and Núñez Rendón 2017] (Figure 6). Beneath the pyramid, inhabitants constructed an artificial cave [Heyden 1975, 1981]. This vertical order (Old God of Fire-pyramid-cave) was created by inhabitants of Tlalancaleca several decades or a century prior (Figure 7). Cerro Grande, Tlalancaleca's largest pyramid (ca. 55×53×17 m; Figure 7c), is located at the center of the site and contained a stone brazier of Huehuetéotl interred at its top (Figure 7b). Roughly 100 meters to the east of the pyramid, there is a large sink hole indicating the presence of a subterranean cave (Figure 7d).

We suggest that this verticality materialized at both sites relates to common meanings conceptualizing sacred mountain in the Mesoamerican landscape. Plunket and Uruñuela (2012b: 40) explain that these meanings consist of 1) the center and cosmic axis of the world; 2) the origin place of human beings; 3) the house of the patron deity; 4) source of social order, power, and authority; and 5) the dwelling of the dead. The sacred mountain is not only located at the center of the world from which all land extends towards the cardinal directions, but also represents an axis mundi – a vertical axis articulating/linking sky, earth, and underworld. To Mesoamerican people, therefore, this made the axis mundi (and the pyramid replicating the sacred mountain) an important place for communicating with supernatural beings.

At Tlalancaleca, we interpret the Cerro Grande Pyramid as a place where people communicated with supernatural beings associated with the prominent volcanoes of the landscape. Given that the Popocatépetl (Figure 7a) was an active volcano (and continues as so to present), it was a living being to which inhabitants of Tlalancaleca needed to attend. The representation of the Old God of Fire on top of the Cerro Grande Pyramid, a sculpture manufactured with the material extracted from the volcanic mountains, clearly indicates one of the deities people venerated with obvious allusions to a mountain that smokes. Ruling elites at Tlalancaleca might have served as the intermediaries between gods and human beings through rituals carried out on top of this pyramid. If these rituals integrated different social sectors, this might have made possible the collective labor for the construction of the cave located to the east of the pyramid. Although we still need to verify whether this subterranean feature goes underneath the pyramid and whether it is human-made through further fieldwork, the sink hole alludes to the planned action for installing an entrance to the underworld. We think the coordinated materialization of these elements (cave, pyramid, and Huehuetéotl) could not have been carried out without the establishment of a sophisticated intellectual system. Therefore, the execution of materializing worldview at Tlalancaleca represents a certain degree of social maturity.

Other archaeological data supporting our interpretation include evidence of religion and time-keeping (Figure 8) and uniformity in architectural orientation and style. These cultural elements characterize other sites within the Puebla-Tlaxcala region [Carballo 2016] and were later homogenized at Teotihuacan [Carballo 2009; Cowgill 2015; Millon 1993; Murakami 2014; Sugiyama 2005]. This might mean that immigrants from the Puebla-Tlaxcala region contributed to the materialization of worldview—and thus, state—at Teotihuacan.

We think that some of the cultural traits that were masterfully executed at Teotihuacan were directly inherited from the Puebla-Tlaxcala region where Tlalancaleca played a principal role. Presumably Tlalancaleca was already organized by ruling elites with a complex social stratification by at least the Late Formative (500-100 BC). Therefore, the similarities observed at Teotihuacan do not simply represent those of style and the tradition of material culture; they imply the complexity of human behavior

Figure 8. Sculpture that represents the calendric system (exhibited at the Community Museum of San Matías Tlalancaleca).

that sought to express visibly the legitimacy of the government through the materialization of the worldview. This could be an indirect proof that Teotihuacanos took as their politico-religious foundation the intellectual system established at Tlalancaleca (Figure 9). We do not think, however, that Teotihuacan rulers inherited cultural elements of earlier societies randomly. Specific elements were selected with intention for managing the foundation of the state with success.

State Formation: from Tlalancaleca to Teotihuacan

Within the framework of the PATP, we have carried out nine field seasons between 2012 and 2022 exploring various parts of the La Pedrera and its surrounding area [Kabata, et al. 2014; Murakami, et al. 2017; Murakami, et al. 2018] through: 3D mapping with a total station and drone, survey and surface collection, auger probing, geochemical analysis of soils, and excavations. In this section we present some of the results and discuss alternative interpretations for better understanding urbanization and state formation at Teotihuacan.

The ceramic chronology of the Puebla-Tlaxcala region has well defined complexes/phases, but its absolute dates required and have undergone significant revision [Lesure, et al. 2006; Lesure, et al. 2014; Murakami, et al. n.d.]. This made it difficult to compare social dynamics of the adjacent areas synchronically but as this project revises the absolute dates, we lay the evidence for interpretations that articulate Teotihuacan and Tlalancaleca as interacting peers. We argue that between AD 150 and 200 (Teotihuacan was developing as a state [Murakami 2014]), Tlalancaleca had not been abandoned but rather was a powerful polity undertaking the construction of numerous monumental structures [Kabata and Murakami 2015: 149-154]. This is based on the results obtained from excavations at Structure C1 (Fase IIIa and b: 71×58×14 m; Figures 10 and 11).

Within this pyramid, two substructures of earlier phases were found. The pyramid of the second construction phase had a volume of ca. 52×42×14 m (Figure 12) with four stacked platforms with talud and vertical wall. Later, another platform was built (71×58×1.3 m) covering the first (basal) platform of the Phase II. Radiocarbon samples collected from an earthen floor assigned to Phase II (capa X in Figure 13) date it to around AD 150-200. This corresponds to the penultimate construction stage and the final extension occurred after this date. This indicates that state formation at Teotihuacan and the urban apogee at Tlalancaleca occurred contemporaneously [Murakami, et al.

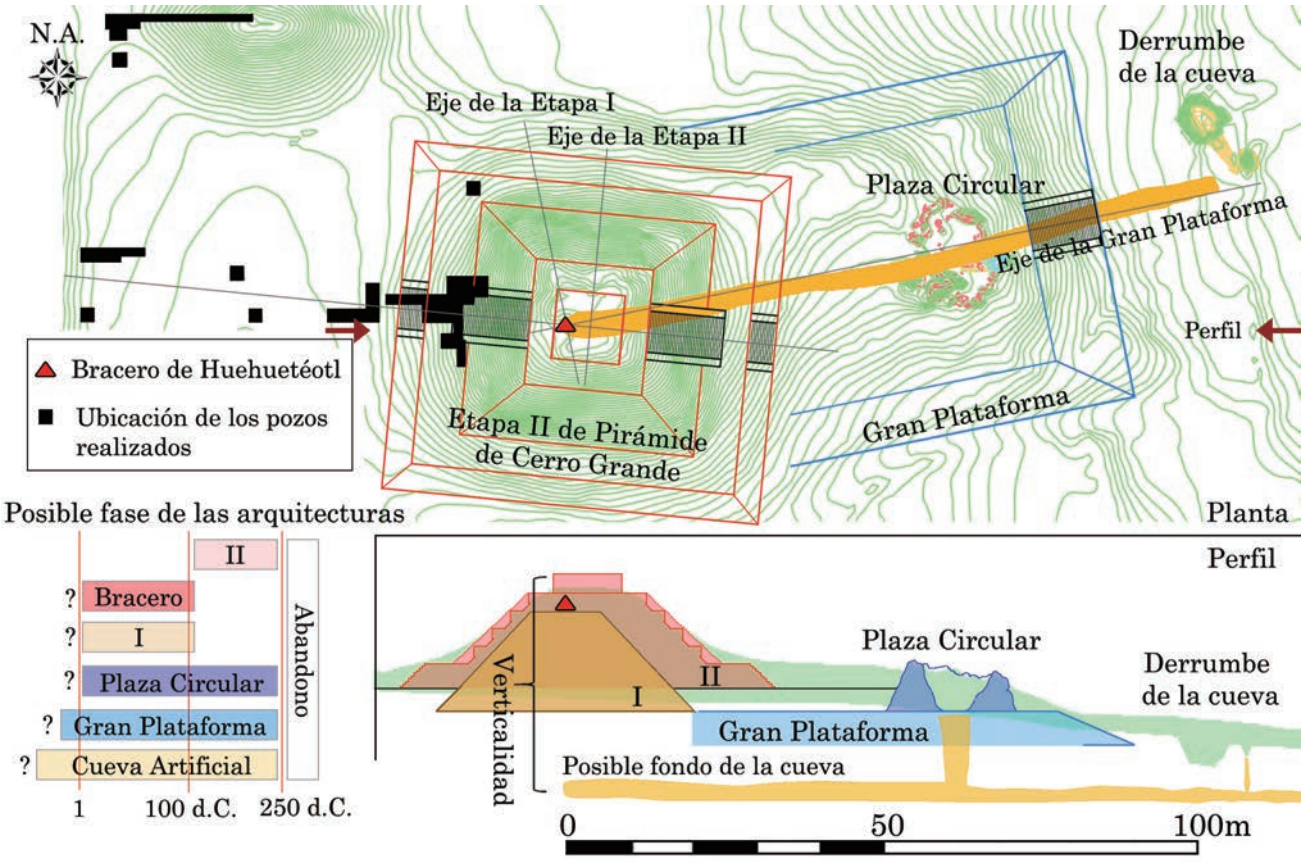

Figure 9. Schematic reconstruction of the possible vertical order with architectural elements observed at the Complex of Cerro Grande.

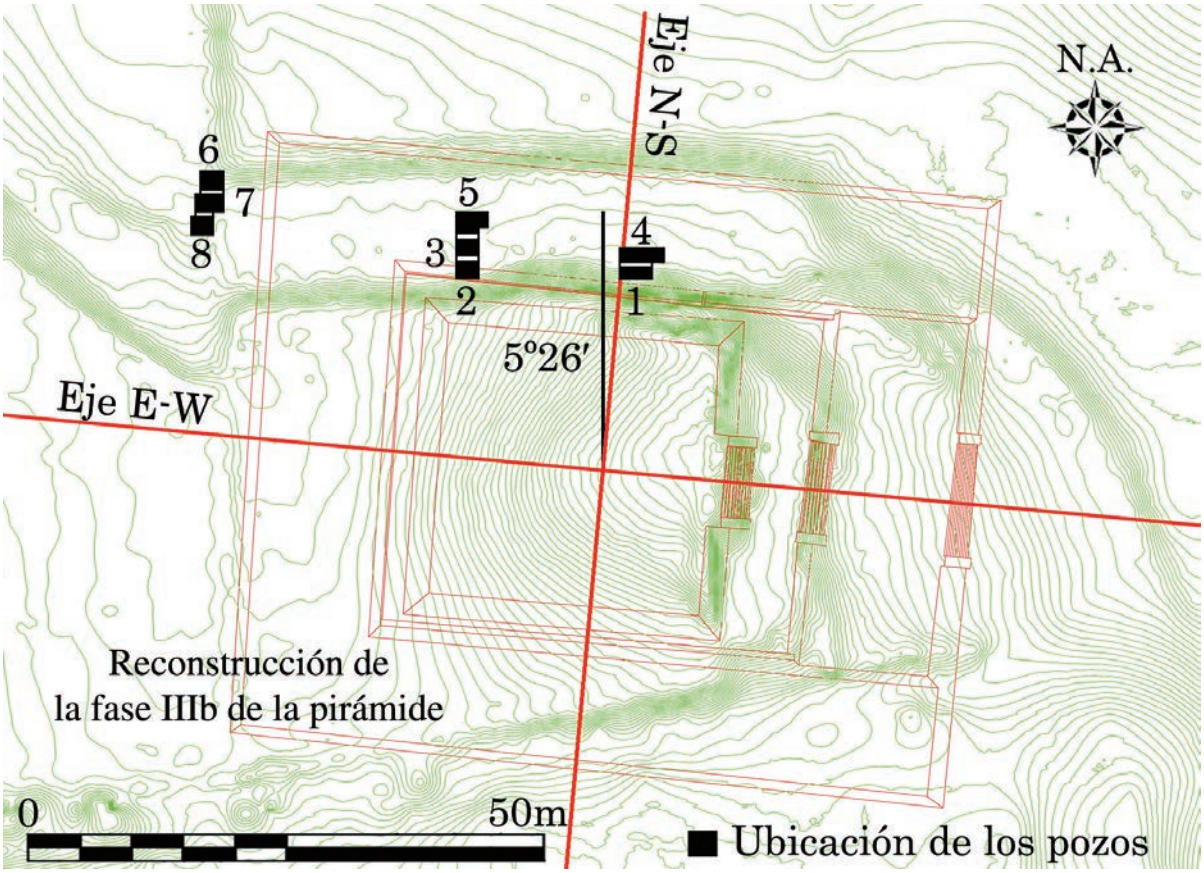

Figure 10. Plan of Structure C1 showing the location of test excavations and the reconstructed form of the platform.

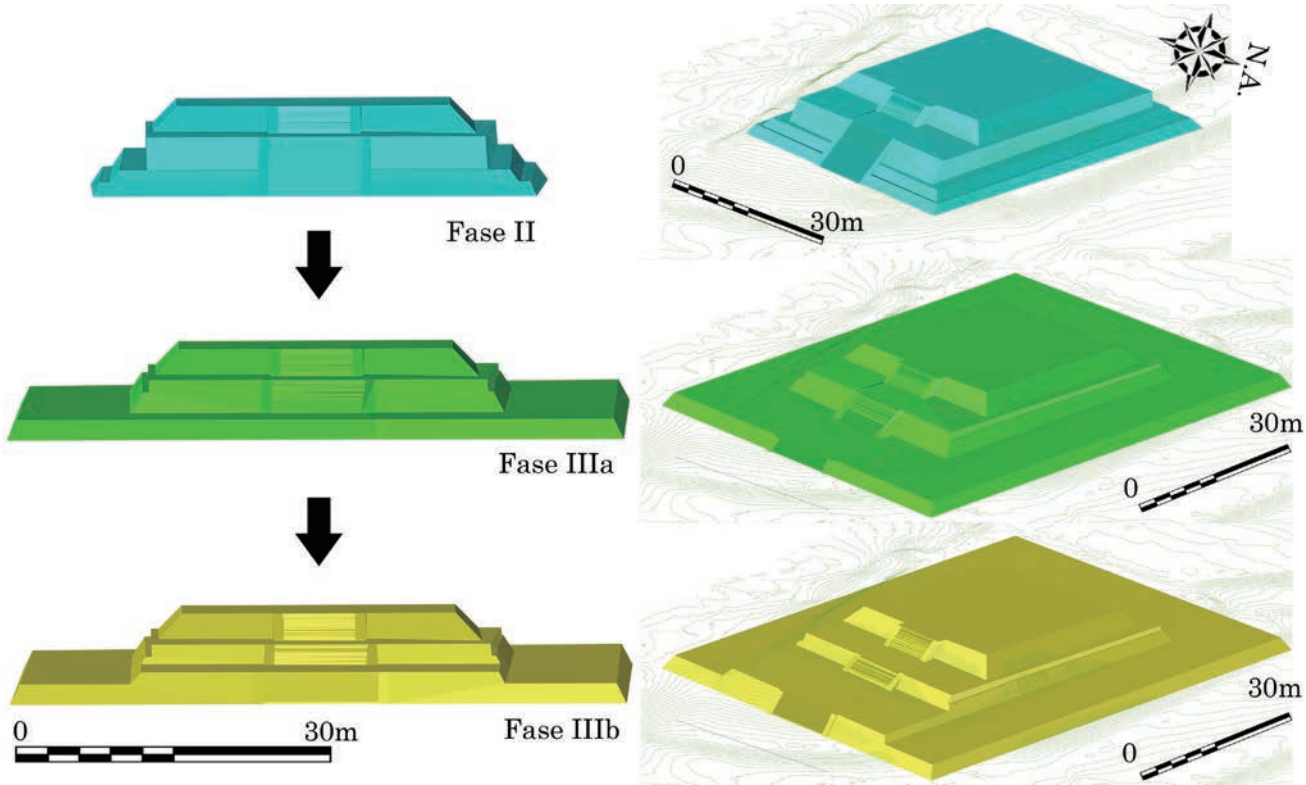

Figure 11. Construction process of Structure C1 created using AutoCAD (Fase I cannot be reconstructed due to the lack of data; reconstructed by Hironori Fukuhara).

Figure 12. General View of Pits (Pozos) 2, 3, and 5 (taken from northwest).

2017]. Tlalancaleca, therefore, clearly survived the Plinian eruption of Popocatepetl around AD 70. In fact, we did not identify any ash layer that would have derived from the eruption in auger probing across the site. We would also add that state formation at Teotihuacan does not only reflect social transformation associated with the development and decline of Tlalancaleca, but rather a macroregional dynamics in Central Mexico.

It is difficult to reconstruct in more detail the relationship between the decline of Tlalancaleca and the emergence of the Teotihuacan state with our data currently available. However, there are several scenarios we still think critical to evaluate at present: 1) ruling groups at Tlalancaleca migrated to Teotihuacan and promoted the foundation of the Teotihuacan state; 2) Tlalancaleca and Cuicuilco were competing with each other in the middle of social disorder and conflicts originated in the volcanic eruptions; Teotihuacan began to gain power as an independent entity; and 3) Tlalancaleca, Teotihuacan, and probably Cuicuilco built a confederate state, with Teotihuacan serving as the capital.

The first alternative is not sustainable to judge the current evidence. Considering the presence of several architectural complexes within the site that pertain to the same phases (Figure 3), we presume the objectives and desires of the leaders at Tlalancaleca were not uniform but variable, and so it is risky to assume that everyone was unanimously dedicated to building the Teotihuacan state. While some groups of people could have looked towards Teotihuacan for a new base, supposing Tlalancaleca was abandoned by the gods due to the volcanic eruptions, others might have stayed at Tlalancaleca and attempted to reinstate the polity. Those groups who stayed at Tlalancaleca, as in the second alternative, could have employed a strategy that disagreed with that of Teotihuacan (and Cuicuilco). Conversely, as in the third alternative, Tlalancaleca's leaders, with their sustained autonomy, could have selected a collaborative relationship with Teotihuacan to thwart off social disorder.

Regarding the timing of the abandonment of Tlalancaleca, the data from the Circular Plaza (Figures 9 and 14) located at the eastern side of the Cerro Grande Pyramid, though indirect, are suggestive. The inner space of the plaza is 15 m in diameter, and boulders (volcanic rocks larger than 1 m^3) form its perimeter. To judge from the stratigraphy and the abundance of Tlamimilopa phase (AD 250-350) Thin Orange ware, it is feasible that groups linked to Teotihuacan, Cholula, or other polities reused this space. In other words, the abandonment of Tlalancaleca occurred

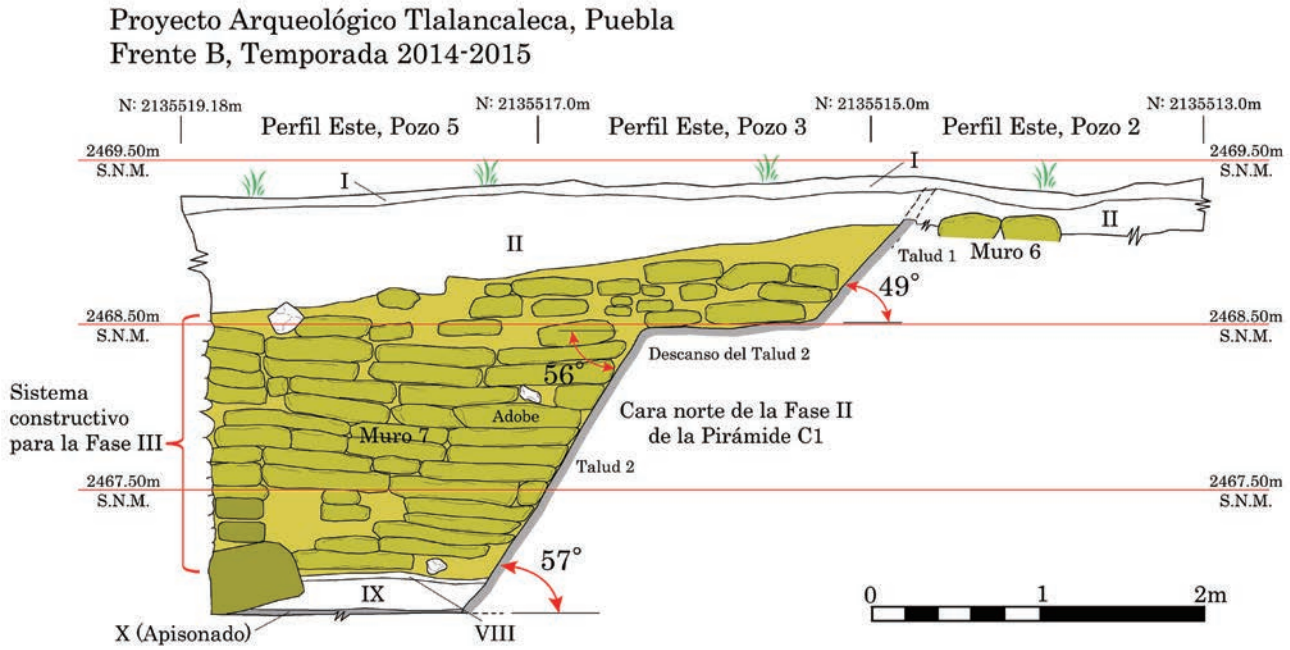

Figure 13. Profile drawing of Pits (Pozos) 2, 3, and 5 (Roman numerals refer to layer numbers).

Figure 14. General view of the Circular Plaza (taken from west).

between AD 250 and AD 350.

Conclusion

Teotihuacan certainly inherited part of the intellectual system and its materialization conceived by Formative societies. However, taking into account that the moment of depopulation at Tlalancaleca coincides with the expansion of the Teotihuacan state [García-Des Lauriers and Murakami 2021], there was probably some paradigm shift; Teotihuacan's ruling elites refined the intellectual system and materialized it more faithfully, which may have been represented in the construction of the Feathered Serpent Pyramid [Sugiyama 2005]. This would have allowed the state to expand successfully to other regions. We emphasize that in order to clarify state formation at Teotihuacan, it is necessary to examine cultural continuities and discontinuities between Formative and Classic societies placing these societies on the same historical axis.

While there are a number of studies that focused on the factors that fueled the development of state society at Teotihuacan, there are few studies that delve into why the Teotihuacan state formed in the specific place that it did, and the mechanisms by which social transformation resulted in power centralization and population nucleation. We see in the majority of previous studies problematic dichotomy between internal and external factors. We think articulating both in interpretations is key, which we can do by studying geopolitical relations in the surrounding areas, the environment, and internal factors. The internal and external dichotomy characterizing interpretations is in part due to the influence of politics in the academia and the formation of nationalism in Mexico, particularly in the sense of promoting tourism; the flow of researchers and funding gets concentrated both qualitatively and quantitatively at Teotihuacan, a phenomenon that increases archaeological data from the metropolis on the one hand but decreases data from sites representing the surrounding societies. All this has resulted in a Teotihuacan-centered perspective in archaeological interpretations. This centrality has made it difficult to develop a diachronic perspective to study Formative societies in relation to Teotihuacan and its state formation. Moreover, it has inhibited to develop a synchronic perspective that sees macroregional processes without imposing a pre-defined center-periphery structure. In this sense, our project has a potential to develop a new perspective that views societies that developed earlier than Teotihuacan or those in the surrounding areas as equally important constituents of sociopolitical dynamics in the Formative-Classic transition.

Acknowledgements

El Proyecto Arqueológico Tlalancaleca, Puebla (PATP) has been supported by the following grants and agencies: JSPS KEKENHI Grant Numbers 19H01347, 20H05140, and 22H04455, awarded to Kabata, and the Wenner-Gren Foundation for Anthropological Research (Gr. 8852; 2014-15), National Science Foundation (BCS-1524214; 2015-2019), Matsushita International Foundation (2012), Tulane University's Stone Center for Latin American Studies (2014-2021), Committee on Research Grant (2013-2019), Lurcy Grant (2014-2020), and Carol Lavin Bernick Faculty Grant (2018, 2020), awarded to Murakami. We are grateful for edits and comments on an earlier draft of this chapter by Alexander Jurado.

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Aportaciones arqueológicas, educativas y del desarrollo local por el Proyecto Arqueológico Estero Rabón

Hirokazu Kotegawa

Introducción

La participación de arqueólogos japoneses en la arqueología del continente americano se comenzó a partir del año 1958 cuando el equipo de la Universidad de Tokyo inició un proyecto en la región de los Andes [Ohnuki 1981: 5; Seki 2014: 1]. Desde entonces, la Universidad de Tokyo tuvo una gran iniciativa para formar un equipo organizado y fuertemente unido de arqueólogos japoneses, quienes trabajaron en la región andina presentando valiosos estudios en cuanto a las civilizaciones antiguas andinas. Aunque los miembros del equipo de la Universidad de Tokyo consiguieron trabajos en distintas universidades en Japón, mantienen una fuerte relación entre ellos, desarrollando su propia investigación en distintos sitios arqueológicos.

Por otro lado, la participación de arqueólogos japoneses en la región mesoamericana fue un poco diferente. Algunos de los primeros arqueólogos japoneses en la región de Mesoamérica fueron Yoko Sugiura [Embajada de México en Japón 2022] y Kuniaki Ooi [Okoshi 2009] en los años 60´s y 70´s. Ellos llegaron individualmente por su propia voluntad e iniciativa. Después de ellos también llegaron otros arqueólogos japoneses de distintas generaciones a toda la región mesoamericana en distintos momentos [Ichikawa 2014].

En la simple vista de la historia de los arqueólogos japoneses en el continente americano particularmente en la región andina y mesoamericana, se observa muy diferente desarrollo entre ambas regiones, ya que en la región andina hay un desarrollo por el equipo de la Universidad de Tokio y en la región mesoamericana se observa un desarrollo por arqueólogos individuales. Tal vez, esta manera de visualizar las situaciones de los arqueólogos japoneses en la arqueología de Mesoamérica y de los Andes es demasiadamente simplificada porque hubo algunos arqueólogos japoneses que comenzaron sus investigaciones individualmente fuera del equipo en los Andes. También hubo un grupo de arqueólogos japoneses en Mesoamérica como el equipo organizado por la Agencia de Cooperación Internacional del Japón (JICA) para el Proyecto de La Entrada en la región occidental de Honduras.

En el presente artículo, se mostrarán algunas aportaciones de un proyecto arqueológico en la costa sur del Golfo de México en donde se desarrollaron la cultura olmeca en el periodo Preclásico y otra cultura posterior en el periodo Clásico Tardío/Terminal. El proyecto se llama Proyecto Arqueológico Estero Rabón (PAER) dirigido por el autor a partir del año 2012 hasta la fecha [Kotegawa 2015; 2020] (Figura 1). El autor también llegó individualmente a México en el año 2002 y se quedó hasta el año 2018, aunque actualmente se encuentra en Honduras. Cabe mencionar que el autor llegó individualmente pero siempre recibe muchos apoyos de varios amigos arqueólogos japoneses de misma generación y otras generaciones. Tal vez, la situación de los arqueólogos japoneses en la región mesoamericana está cambiando durante las últimas décadas. No es como el equipo de los arqueólogos en la región andina, pero tampoco es tan solitario como los primeros arqueólogos japoneses en la región mesoamericana.

Breve historia de los estudios previos de la cultura olmeca

El comienzo de la arqueología olmeca se encuentra en la segunda mitad del siglo XIX cuando se encontró la primera cabeza colosal en Hueyapan, el sitio arqueológico Tres Zapotes actualmente [Melgar y Serrano 1871(1994)]. Desde entonces, hubo algunas discusiones académicas sobre esta cultura “desconocida” porque se observaban las características propias comparando con otras culturas conocidas hasta esa fecha. Por ello, a principios del siglo XX, el equipo de la Universidad de Tulane realizó una expedición arqueológica dirigida por Frans Blom y Oliver La Farge. Ellos encontraron y estudiaron por primera vez el sitio arqueológico de La Venta [Blom & La Farge 2012], que posteriormente se reconoció como una de las capitales olmecas.

A mediados del siglo XX, se realizaron nuevas investigaciones arqueológicas en la región olmeca por Matthew W. Stirling, Philip Drucker y otros arqueólogos americanos [Stirling 1940; 1943a; 1943b; 1947; 1955; 1965; Stirling & Stirling 1942, Drucker 1952; Drucker et al. 1959; Heizer et al. 1968]. Ellos comenzaron investigaciones en el sitio Tres Zapotes y Cerro de las Mesas, luego cambiaron a La Venta e Izapa. Finalmente llegaron a San Lorenzo identificando la importancia de este sitio

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Figura 1. Ubicación de los sitios arqueológicos (15 es el sitio de Estero Rabón).

como una capital olmeca.

Más de una década después de los estudios del equipo de Stirling, Michael D. Coe y Richard A. Diehl [1980] comenzaron un proyecto arqueológico en el sitio San Lorenzo. Ellos detectaron y registraron varios rasgos arqueológicos de la ocupación olmeca, además de aumentar una gran cantidad de los monumentos escultóricos olmecas del sitio. También ellos dieron la atención a la fase posterior de los olmecas que actualmente llamamos la fase Villa Alta (700-1000/1100 d.C.) explicando que hubo una ocupación muy fuerte y grande en esta fecha varios siglos después del abandono del sitio por los olmecas. Otra contribución importante de ellos fue el estudio ecológico del sitio y sus alrededores.

Por otro lado, a partir de los años de 80 Rebecca B. González Lauck comenzó la investigación en La Venta [González Lauck 1994(2000): 369]. Además de varios datos relevantes arqueológicos por su investigación, La Venta ha sido el único sitio arqueológico de la cultura olmeca del Golfo de México abierto al público.

En 1990, Ann Cyphers inició el Proyecto Arqueológico San Lorenzo Tenochtitlán. Su proyecto contiene distintos métodos para averiguar la sociedad de la primera capital olmeca. Su prospección en superficie abarca 400 kilómetros cuadrados mostrando una dinámica historia del desarrollo de la sociedad olmeca en la región desde el Preclásico inferior hasta el Clásico tardío y terminal [Symonds et al. 2002]. Asimismo, se aumentó el corpus escultórico de San Lorenzo incluyendo el hallazgo de la décima cabeza colosal del sitio. Además de numerosos hallazgos de su proyecto, es importante mencionar que Cyphers y su equipo han publicado varios artículos y libros [cf. Cyphers ed. 1998; Symonds et al. 2002; Cyphers 2004; 2012; 2018; 2021; Cyphers et al. 2013; Cyphers et al. 2014; Cyphers y Arieta 2020].

También se han realizado varias investigaciones arqueológicas en la región montañosa de los Tuxtlas dentro de la zona olmeca, por ejemplo, en el sitio arqueológico de Tres Zapotes por el arqueólogo Christopher A. Pool y su equipo [Pool ed. 2003; Pool 2007]. Se considera como la tercera capital por algunos arqueólogos, aunque hay discusiones sobre esta idea, es seguro que fue uno de los asentamientos más importantes de la sociedad olmeca por la cantidad de esculturas olmecas encontradas en Tres Zapotes incluso las cabezas colosales.

Como se han mencionado anteriormente en los estudios previos de la arqueología olmeca, el interés principal de varias investigaciones arqueológicas fue enfocando a los sitios grandes como las capitales olmecas San Lorenzo y La Venta[1]. Por la falta

de estudios arqueológicos de los sitios de menor rango de la sociedad olmeca, el PAER fue iniciado desde el año 2012 teniendo la primera temporada de excavaciones en el mes de enero del 2013. A continuación, se mostrarán los logros del PAER por distintos aspectos.

Objetivos e historia del PAER

El PAER tiene un subtítulo del proyecto como "Reconstruyendo la vida de los olmecas", ya que el interés del director está en los aspectos cotidianos, particularmente sobre las personas del rango social medio-bajo en la sociedad olmeca. El sitio Estero Rabón fue elegido para este proyecto porque se considera como uno de los centros secundarios de San Lorenzo por la ubicación geográfica y presencia de ciertos monumentos escultóricos [Borstein 2001: 158; Symonds et al. 2002: 84; Cyphers 2004(2018): 26]. Sin embargo, como se han mencionado brevemente los estudios previos de la sociedad olmeca, hemos tenido las interpretaciones solamente a través de las investigaciones de los grandes sitios. Es decir que los datos utilizados para las interpretaciones sobre la sociedad olmeca se recolectaron en las capitales y otros pocos sitios. Por lo menos, no hemos tenido suficientes datos arqueológicos excavados del centro secundario Estero Rabón. Para averiguar este aspecto, reconstruir la vida cotidiana de los olmecas del rango medio-bajo de la sociedad olmeca es el objetivo principal del PAER.

Por otro lado, en el año 2012, la Universidad Veracruzana necesitaba y buscaba un proyecto arqueológico para realizar una práctica de campo de excavaciones arqueológicas para sus estudiantes. Por esta razón, se ha planteado el PAER para realizar esa práctica de campo en el mes de enero de 2013 y fue elegido por la universidad y aprobado por el Consejo de Arqueología del Instituto Nacional de Antropología e Historia. Así, la formación de los jóvenes arqueólogos mexicanos a través de las prácticas de campo y los análisis de datos arqueológicos en laboratorio fue convertido en un objetivo educativo siendo una parte de los objetivos fundamentales del PAER. Por la misma razón, los datos obtenidos por el PAER también fueron utilizados por los estudiantes para las tesis del grado de licenciado.

Relacionando con el objetivo educativo del PAER, planteamos un objetivo sobre el desarrollo de la comunidad local donde se encuentra el sitio Estero Rabón, porque en el mundo latinoamericano ha sufrido mucho tiempo sobre la destrucción y la pérdida del patrimonio arqueológico por falta de la vinculación adecuada de los pobladores locales. Es importante que los jóvenes arqueólogos también estén conscientes de este grave problema para toda la arqueología y es necesario trabajar desde este momento buscando alguna solución del problema. Por ello, proponemos un objetivo social: que los pobladores de la comunidad tengan la información adecuada y actúen voluntariamente para la protección del patrimonio arqueológico con su propia iniciativa. Para esta meta decidimos aplicar varias actividades relacionadas con la Arqueología Pública.

Por las situaciones mencionadas, el PAER fue comenzado a partir de abril del año 2012 teniendo el primer contacto con las autoridades de la comunidad actual, el ejido San Isidro, para planear la propuesta de la investigación. Después de tener contacto con las personas de San Isidro, fue necesario comunicar con la arqueóloga Ann Cyphers de la Universidad Nacional Autónoma de México porque el sitio Estero Rabón está dentro de su área de investigación del Proyecto Arqueológico San Lorenzo Tenochtitlán desde 1991. Afortunadamente, el autor fue uno de sus alumnos del doctorado desde el año 2002 teniendo comunicación continua con la arqueóloga Cyphers. Así, habló con ella por teléfono para consultar sus opiniones. Ella estuvo de acuerdo que un nuevo proyecto arqueológico en el sitio de Estero Rabón es importante y necesario. También ofreció su apoyo para explicar al Consejo de Arqueología del Instituto Nacional de Antropología e Historia para que el autor no tuviera problema en el dictamen de la propuesta del proyecto.

Contando con el apoyo de la arqueóloga Cyphers, el autor comenzó a elaborar una propuesta de investigación con mucha ayuda de sus colegas, particularmente por el arqueólogo Roberto Lunagómez de la misma Universidad Veracruzana. Así, se inició a largo plazo el proyecto arqueológico en este sitio Estero Rabón. Hasta la fecha se cuentan cuatro etapas durante una década del PAER: la primera etapa fue desde el comienzo del PAER en 2012 hasta la última temporada de excavaciones en 2015 con los estudiantes de la Universidad Veracruzana, luego la segunda etapa entre 2016 y la primera mitad de 2019 fue el momento de sufrimiento para el PAER por no poder realizar trabajos de campo, aunque el proyecto se mantuvo activo realizando publicaciones y ofreciendo algunas pláticas para los pobladores de San Isidro. A partir de la segunda mitad de 2019 hasta marzo del 2022 fue la tercera etapa del PAER realizando un trabajo de Arqueología Pública con el apoyo de un financiamiento científico de Japón[2], finalmente estamos en la cuarta etapa para comenzar un nuevo estudio, aunque es necesario conseguir otros financiamientos para regresar a las excavaciones en el sitio de Estero Rabón.

Contribuciones arqueológicas

Como se ha mencionado anteriormente, el objetivo principal

del PAER es el averiguar la vida de los olmecas en un centro secundario olmeca. Para ello, hemos realizado tres temporadas de excavaciones con 110 pruebas de barreno, 5 unidades con 8 pozos de sondeos durante 2013-2015 (Figura 2).

La prueba de barreno es una técnica de la excavación arqueológica intensiva muy empleada actualmente en el sur de la costa del Golfo de México [Cyphers 2012; Cyphers et al. 2014; García Flores 2018]. Se utiliza una herramienta particular (Figura 3) para sacar muestras de suelo perforando un pequeño volumen de tierra. Nuestra herramienta tiene unos 10 cm de diámetro y unos 30 cm de largo en la parte que saca la muestra del suelo. Esta herramienta se mete por fuerza humana girando la misma.

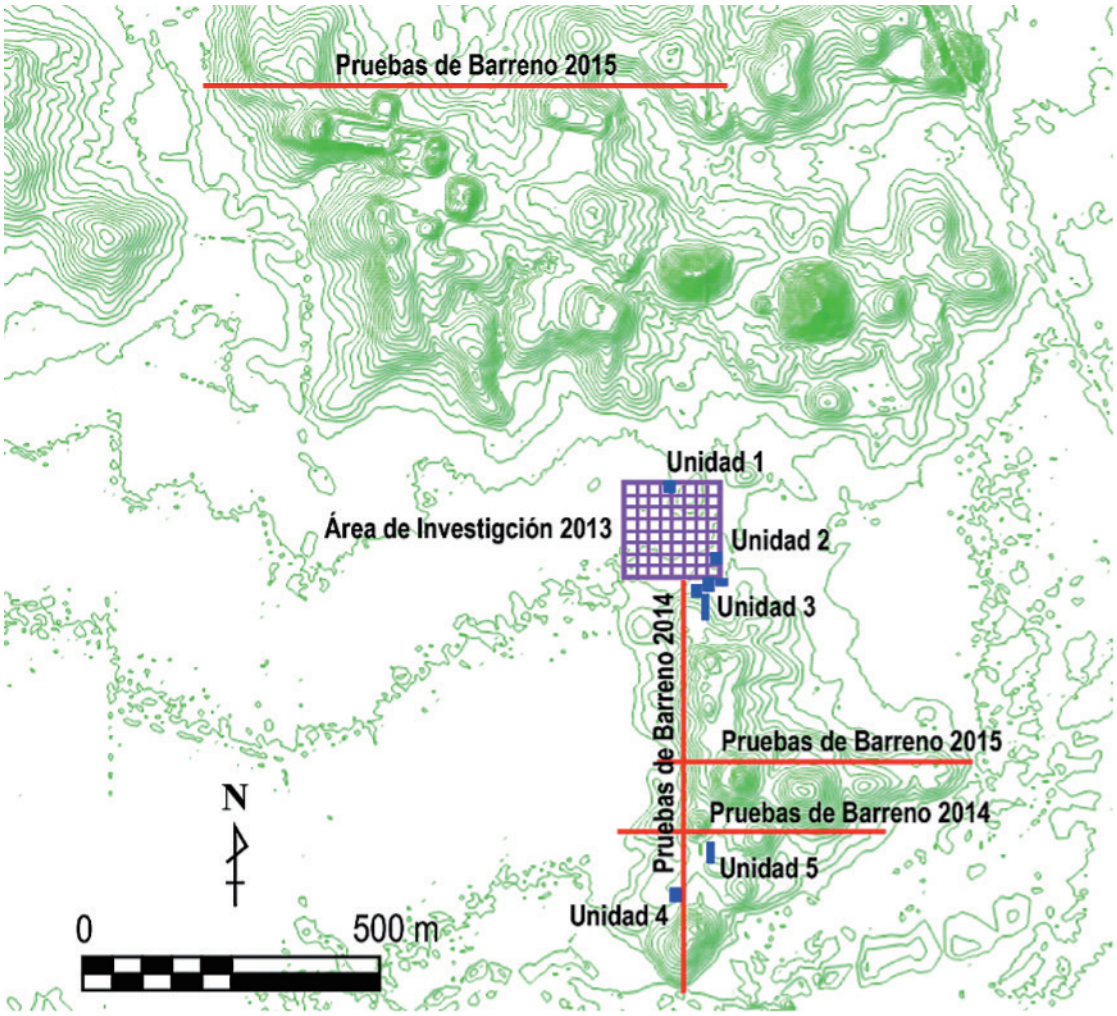

Figura2. Ubicación de las excavaciones del PAER en el sitio de Estero Rabón.

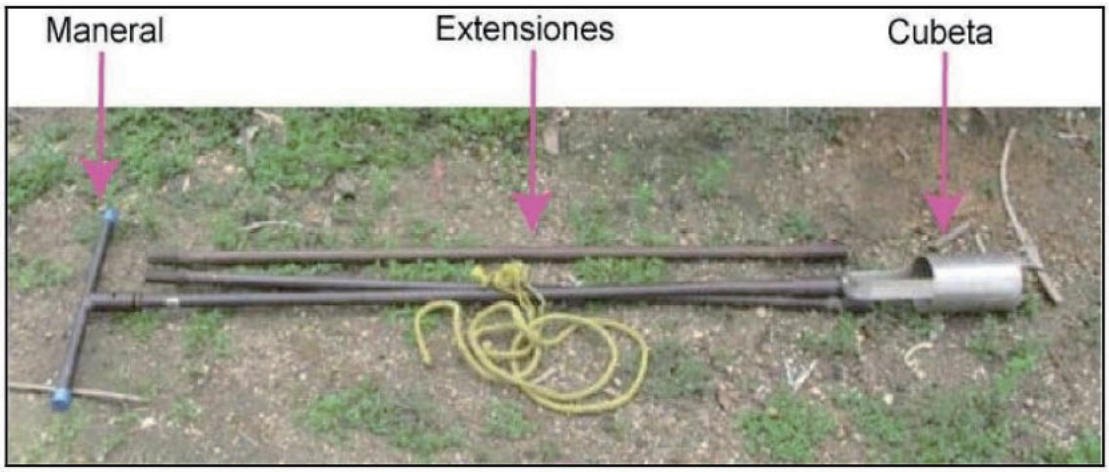

Figura 3. Herramientas de pruebas de barreno.

Figura 4. Fotografía de excavación profunda de pruebas de barreno.

Se puede perforar la profundidad necesaria aumentando las extensiones (Figura 4). La ventaja de esta técnica es que se puede excavar más rápido que con otros métodos por menos volumen de tierra que extraemos por esta técnica, además de reducir la afectación al sitio. Por ejemplo, entre 5 a 7 m de profundidad podemos excavar solo un día en lugar de varias semanas a través de un pozo de sondeo normal con un tamaño de 2 x 2 m. Hemos realizado éstas excavaciones en varias partes del sitio, pero todavía no hemos aplicado esta técnica en toda la dimensión del sitio que se calcula en unas 210 ha. Sin embargo, hemos tomado unos ejes principales del sitio para comprender la sedimentación general del sitio durante éstas primeras tres temporadas. Pero, según los análisis de los datos recolectados por las pruebas de barreno en Estero Rabón, no hemos encontrado alguna evidencia de la ocupación olmeca hasta la fecha, ya que todos materiales arqueológicos recolectados por esta técnica en Estero Rabón se identifican a la fase Villa Alta del Clásico Tardío y Terminal (700-1000/1100 d.C.) según la tipología cerámica de la región [Coe & Diehl 1980; Symonds et al. 2002].

Aunque los resultados de pruebas de barreno no favorecieron al objetivo arqueológico del PAER, realizamos algunas excavaciones por medio de pozo de sondeo para averiguar la vida de la población posterior del sitio, además de cumplir el objetivo educativo. Durante las tres temporadas de campo, se abrieron cuatro pozos de sondeo con el tamaño de 2 x 2 metros (dos de ellos tuvieron extensión de 1 o 1.5 metros) y cuatro trincheras de distintos tamaños (dos trincheras de 1 x 3 metros, una de 1 x 1.5 metros y la otra de 1.5 x 2 metros) (Figura 2). A través de estas excavaciones, se han encontrado varios contextos arqueológicos interesantes de la fase Villa Alta. A continuación, se mencionan los detalles de los rasgos arqueológicos detectados en dichas excavaciones.

En la Unidad 1 que se encuentra al lado norte de la zona pantanosa ubicada en el centro del sitio, dispuesta ésta entre dos espacios elevados, se encontraron cuatro pisos de tierras apisonadas superpuestos con una huella de poste, un fogón y un depósito de chapopote, además de posibles huellas de inundaciones encima de algunos pisos (Figura 5). Arriba de estos rasgos arquitectónicos como evidencia de las primeras ocupaciones en la Unidad 1, también se detectó una parte de la fachada occidental de un basamento hecho por barros[3]. Sobre la banqueta inferior

Figura 5. Fotografía de los pisos con huella del poste (en la parte central) y el depósito de chapopote.

o una parte de escalinata del basamento hubo una concentración fuerte de carbón con cierta cantidad de fragmentos cerámicos. No sabemos cuántos cuerpos tenía este basamento ni cuál fue la altura total de él porque no pudimos excavar la totalidad del mismo. Por lo menos, hemos detectado dos cuerpos del basamento; el primer cuerpo tiene por lo menos un desnivel teniendo la parte inferior con unos 70 centímetros de altura y la parte superior con unos 50 centímetros de altura, y el segundo cuerpo tiene unos 80 centímetros de altura dentro de nuestra excavación (Figura 6).

A través de estos rasgos excavados se interpreta que en este espacio primero fueron construidos pisos apisonados de tierra o barro con unos postes que sostenían el techo, aunque no sabemos si tenía muros o no. Según la presencia de un fogón y un depósito de chapopote, además de la ubicación en la orilla de la zona pantanosa, se supone que este espacio fue utilizado como un taller de reparación de canoas o balsas cerca de algún muelle de este pantano, que también se supone que es la huella del antiguo cauce del estero Azuzul que está corriendo actualmente en la orilla sur del sitio. Varias capas delgadas de arena fina encontradas encima de algunos pisos indican que este espacio recibió inundaciones frecuentemente. Tal vez por esta razón, en algún momento fue abandonado este espacio. Después de algún tiempo de abandono de este espacio, gentes de la fase Villa Alta del sitio decidieron construir un basamento en el mismo lugar por alguna razón [García Hernández 2016; Kotegawa 2020]. Tal vez

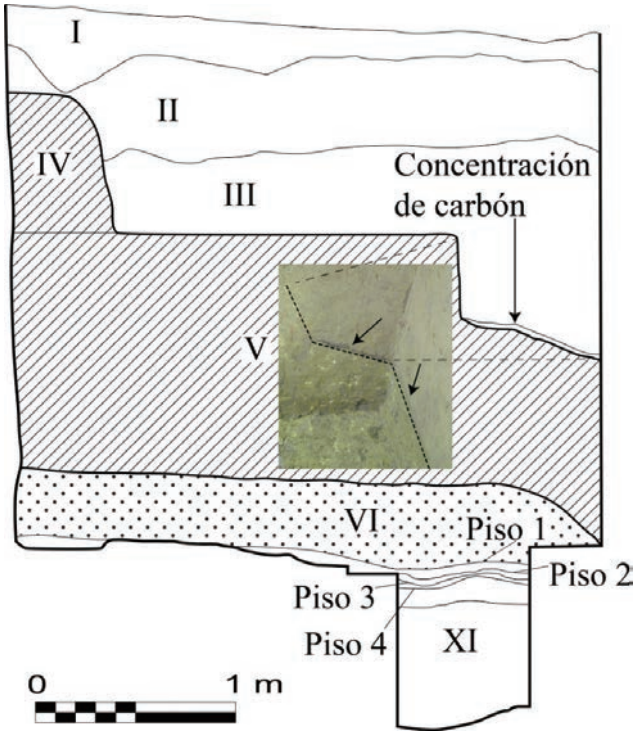

Figura 6. Dibujo y fotografía del perfil Sur de la Unidad 1 (en la fotografía también muestra la concentración de carbón).

la razón fue una ampliación de una plaza grande que tenía esta sociedad hacia más al norte de este espacio junto con los dos edificios más grandes del sitio. No hemos tenido alguna evidencia que nos indique el uso del basamento, pero después de ocuparlo fue abandonado haciendo un ritual de la terminación de este espacio.

Otros hallazgos interesantes del sitio fueron encontrados en la Unidad 3 ubicada al otro lado sur de la zona pantanosa del sitio. Se encontró un basamento bajo con una altura de casi 1 metro y encima del mismo había una gran concentración de fragmentos de distintos materiales arqueológicos y una fuerte concentración de carbón (Figura 7 y Figura 8). Este basamento bajo tenía una cama de varias rocas de bentonita colocadas y acomodadas intencionalmente como algún sistema constructivo (Figura 9). Para averiguar más detalles del basamento, abrimos más trincheras alrededor del pozo de sondeo original de la unidad. En estás trincheras también se detectaron varias concentraciones de materiales arqueológicos fragmentados y rocas de bentonitas, aunque éstas rocas no mostraban acomodos claros como en el pozo de sondeo original de la Unidad 3. Dentro de estos materiales arqueológicos fragmentados se encuentran algunas vasijas casi completas, silbatos zoomorfos, figurillas antropomorfas y zoomorfas, navajas prismáticas de obsidiana verde. En una trinchera también se detectó una persona adulta masculina enterrada en posición sedente junto con algunos objetos como una ofrenda asociada; cajetes, platos, silbatos, navajas prismáticas (Figura 10). Aunque no estaban juntos con el individuo, en casi misma profundidad se encontraron varias cerámicas completas colocadas boca abajo y superpuestas. El individuo tenía un pendiente en forma de cabeza humana y dos cuentas tubulares de piedra verde[4] (Figura 11).

Según los hallazgos de la Unidad 3 además de la ubicación geográfica en el sitio, se interpreta este espacio como un muelle del antiguo cauce del estero Azuzul o la zona pantanosa que está dividiendo en dos partes el sitio [García Hernández 2016; Kotegawa 2020]. Las rocas de bentonita encontradas dentro del basamento se interpretaron como un sistema constructivo, porque las rocas de bentonita tienen una característica de absorber humedades y el acomodo de la colocación de ellas parece que funcionaba como una base sólida para que no se hundiera el basamento en el terreno suelto cerca de la zona acuática. Cuando construyeron este basamento, un individuo fue sacrificado enterrando en la orilla norte (el lado cercano al agua) junto con algunos objetos como parte de la ofrenda. Probablemente el individuo tenía cierta importancia dentro de la sociedad porque tenía los accesorios de piedra verde. Por la ubicación y el proceso

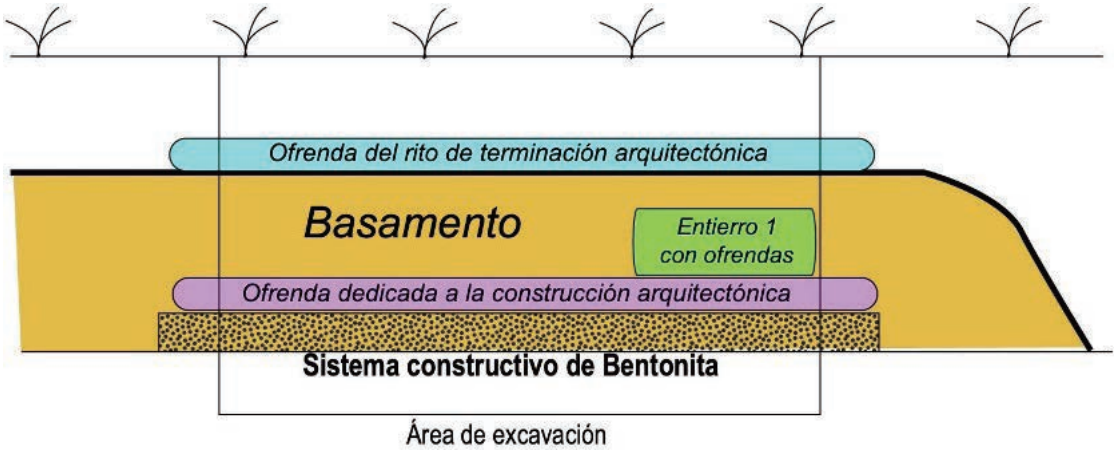

Figura 7. Esquema reconstruido del basamento bajo.

Figura 8. Fotografía de concentración de materiales en la Unidad 3.

Figura 9. Fotografía del sistema constructivo de rocas de bentonita.

Figura 10. Fotografía del Entierro 1 del sitio de Estero Rabón.

Figura 11. Fotografía de la indumentaria de piedra verde del Entierro 1 del sitio de Estero Rabón.

de la construcción del basamento bajo, parece que tenía alguna función importante en la sociedad como un muelle del lado sur de la zona acuática. Aunque hay varias construcciones grandes en la parte sur del sitio, las construcciones más grandes y complejas del sitio se están concentrando en la parte norte. Esto parece que está mostrando la importancia del sitio en la parte norte como la zona residencial y administrativa de las élites del sitio. Si fue así, este basamento bajo de la Unidad 3 funcionaba para recibir las élites del sitio, quienes estaban generalmente en su espacio en el norte del sitio, al espacio público-colectivo de la

comunidad además de recibir varios visitantes y comerciantes de otra región quienes llegaban por vía fluvial. Tal vez, varios silbatos que fueron encontrados en las excavaciones de este espacio pudieron tener la utilidad relacionada con la navegación. Éstas actividades importantes relacionadas con el basamento bajo explicarían la presencia del individuo sacrificado en el momento de la construcción. Se interpreta este individuo como sacrificado porque no se detectó ninguna huella de la fosa para enterrar este individuo después de la construcción y este contexto explicaría que este personaje fue enterrado mientras los constructores llenaban las tierras y barros del basamento bajo. Aunque el basamento bajo tenía una función importante, fue abandonado en algún momento por razones desconocidas, ya que encima del mismo se encontraban varias concentraciones de materiales arqueológicos fragmentados junto con huellas del uso del fuego como un resultado del ritual de terminación del espacio al igual que el contexto encontrado en el basamento de la Unidad 1. Sería interesante enviar las muestras de estos contextos para determinar el momento ocurrido de esos "eventos" en un futuro estudio para averiguar la decadencia de la sociedad de la fase Villa Alta del sitio.

En la Unidad 4 también se han encontrado varios contextos arqueológicos que nos cuentan la sociedad de la fase Villa Alta del sitio [Jurado Azuara 2016]. Aunque no hemos llegado a la capa estéril arqueológicamente de este espacio, se encontró un rasgo arqueológico conformado por tres rocas de un tamaño alrededor de 15 x 20 x 10 centímetros colocadas en forma semicircular, una capa delgada con una concentración de carbón y otra capa de barro cubriendo los anteriores (Figura 12). Tampoco pudimos excavar la totalidad de este rasgo arqueológico por falta de tiempo, ya que se encontró la mitad del rasgo sobre la pared de la excavación. Arriba del rasgo arqueológico mencionado, se encontraba una gran cantidad de materiales arqueológicos fragmentados en dos fosas juntas (la parte más profunda de ellas fue unos 50 centímetros, aunque la dimensión no fue posible delimitar porque estaban extendidas fuera de la excavación) y encima de las dos fosas había otra concentración de materiales arqueológicos fragmentados desde unos 10 centímetros desde la superficie actual (Figura 12 y Figura 13). La cantidad de estos materiales arqueológicos fragmentados fue demasiado porque el volumen de ellos era muchísimo más grande que lo de la tierra que contenía ellos.

A través de los contextos arqueológicos detectados en este espacio, se interpreta que en algún momento hubo un posible horno pequeño, después del abandono del horno se utilizó como basureros abriendo algunas fosas para tirar las basuras [Jurado Azuara 2016; Kotegawa 2015; 2017]. No hemos sabido la función del posible horno, pero no es adecuado para el uso de alguna producción masiva por su tamaño. Tal vez, se estaba utilizando para la preparación de comida o alguna producción doméstica-familiar. Sin embargo, la cantidad abundante de los basureros indica que hubo algunas ocasiones de consumo masivo cerca del espacio. La gran mayoría de los materiales arqueológicos encontrados en estos basureros fue ollas y jarras que parece que fueron utilizadas para la preparación y el servicio de comida y bebida, en algunas ocasiones de banquete colectivo por pobladores y tal vez también con los visitantes. Recordando la interpretación anterior del basamento bajo de la Unidad 3, es lógica realizar este "evento" colectivo en la parte sur del sitio porque se puede considerar como un espacio público comparando con la parte norte del sitio que fue un espacio privado de las élites del sitio. También la ubicación de los basureros se encuentra en el lado trasero de la plaza más grande de esta parte sur del sitio, coincide con la hipótesis del "evento" colectivo presentada para el uso de este espacio.

Figura 12. Fotografías de los perfiles Sur (izquierda) y Oeste (derecha) de la Unidad 4. En la parte inferior del Perfil Sur se observa el posible horno.

Figura 13. Fotografía de la superficie de la capa II (concentración de materiales arqueológicos) de la Unidad 4.

Contribuciones educativas

Durante tres temporadas de trabajo de campo y análisis en laboratorio del PAER, participaron unos 50 estudiantes en total. Algunos estudiantes participaron solamente en los análisis, pero la gran mayoría de ellos participó en ambas labores en campo y laboratorio aprendiendo las técnicas y la ética de las labores arqueológicas. Algunos de ellos presentaron algún estudio arqueológico relacionado al PAER en varios congresos nacionales e internacionales aprendiendo cómo se elabora un estudio arqueológico a través de los datos obtenidos en campo y laboratorio. Como el director es un arqueólogo japonés formado en una universidad de Japón, ellos aprendieron las técnicas y métodos en la excavación y los análisis de los datos arqueológicos con un estilo japonés. Tal vez, el estilo japonés no es muy diferente que el mexicano, pero pudieron conocer otra manera de trabajar en la arqueología a través del PAER.

Seis de los estudiantes participantes al PAER, eligieron algún tema relacionado con los trabajos del PAER para la titulación de la licenciatura. Los temas son los siguientes: Construcciones arquitectónicas en la fase Villa Alta [García Hernández 2016], Monografía sobre los estudios relacionados con la sociedad olmeca [Saucedo Zavala 2016], Monumentalidad en la arqueología [Cortés Hernández 2016], Interpretación de un contexto de basureros en el sitio [Jurado Azuara 2016], Las líticas del sitio [Aguilar Pérez 2017], y La utilidad de la técnica de pruebas de barreno en el sitio [García Flores 2018]. Algunos de ellos siguen estudiando y laborando en la arqueología y otros eligieron otro camino, pero espero que todos aprendieran algo a través de este proceso largo y duro del aprendizaje en la arqueología y en el PAER para sobrevivir en este mundo.

Contribuciones en el desarrollo local

Desde el inicio del PAER, las autoridades y los pobladores del ejido San Isidro nos ayudaron mucho para realizar nuestra labor arqueológica en el sitio Estero Rabón, aunque también nos contaron que habían recibido varios arqueólogos, pero ellos nunca les dejaron a los pobladores de San Isidro los resultados de sus estudios. Así, los pobladores de San Isidro siempre habían tenido desconfianza de los arqueólogos además de muchas dudas sobre la sociedad antigua que existió en el pasado del terreno.

Por ello, sentimos un compromiso fuerte e importante con los pobladores de San Isidro para informarles todos los resultados de nuestro trabajo. Para cumplir este compromiso, planeamos varias actividades relacionadas con la arqueología pública desde la primera temporada 2013 del PAER. Para nosotros la arqueología pública es la búsqueda de una mejor manera de convivencia entre la arqueología y la sociedad actual, considerando que es también una de las buenas herramientas estratégicas para la divulgación arqueológica. Las principales actividades realizadas fueron una serie de pláticas en un día cada semana durante nuestra estancia en la comunidad, explicaciones sobre los hallazgos y nuestro trabajo en las excavaciones, y visitas a las familias de la comunidad para un intercambio de los conocimientos con los estudiantes.

Las pláticas de cada semana se prepararon principalmente por los estudiantes del PAER con los temas relacionados a la arqueología general y al sitio Estero Rabón. Por ejemplo, ¿qué es la arqueología?, ¿qué es la cultura olmeca?, ¿qué sabemos del sitio Estero Rabón?, ¿para qué sirve la arqueología? etc. Además de estas pláticas generales, siempre mostramos los resultados de nuestra investigación en la última plática de cada temporada de campo. Así, realizamos generalmente unas 5 pláticas en cada temporada. Siempre vienen muchos pobladores en la primera y la última plática, pero la participación de los pobladores disminuyó drásticamente en otras ocasiones.

En cada año cuando llegamos a la comunidad para realizar las excavaciones, siempre invitamos a los pobladores para que vengan a ver nuestro trabajo en las excavaciones. Por ellos, estábamos dejando libre la entrada al área de excavaciones y listos para responder sus preguntas. Sin embargo, no llegaron muchos pobladores durante las temporadas de campo. Es considerable porque los pobladores también tenían trabajos en su terreno y casa durante el día. Pero, por lo menos, los niños de la escuela primaria de la comunidad nos visitaron cada año con su maestro o maestra. Escucharon las explicaciones de los hallazgos y nuestro trabajo. También algunos adolescentes y adultos nos visitaron cuando tuvieron tiempo y manera de llegar a las excavaciones,

porque las excavaciones se encontraban un poco lejos de la comunidad. Consideramos que una visita a las excavaciones puede dar más información e impactos a los visitantes. Tal vez, para las investigaciones futuras, debemos buscar alguna estrategia para recibir más visitas de los pobladores en las excavaciones.

Las visitas a las familias de la comunidad tenían tres objetivos particulares. El primer objetivo es conocer el interés de los pobladores sobre el patrimonio arqueológico de la comunidad. El segundo objetivo es crear buena relación y ambiente entre los pobladores y el miembro del PAER a través de una conversación sobre un tema compartido, que fue el patrimonio arqueológico de la comunidad. El último y tercer objetivo es saber quiénes tienen los objetos prehispánicos en su casa y cuáles son. Parece que el resultado más relevante de esta actividad fue que pudimos observar el orgullo de algunos pobladores mostrando "sus piezas" y experiencias relacionadas con el patrimonio arqueológico de la comunidad frente a los estudiantes.

En el año 2015, realizamos un nuevo reto que fue dar una dignidad a las esculturas prehispánicas resguardadas en la comunidad San Isidro, ya que ellos solamente juntaban esas esculturas olmecas en frente de la casa ejidal sin dar atención especial ni un mantenimiento adecuado del espacio [Kotegawa y García Hernández 2017]. Por ello, les ofrecimos construir una base de exhibición para éstas esculturas para que ellas reciban un respeto merecido por los pobladores y visitantes. Cuando comenzamos la construcción muchos pobladores no mostraron interés, pero finalmente les gustó la construcción (Figura 14). Sin embargo, nos dimos cuenta que este reto fue sólo un comienzo del más grande desafío con ellos porque las esculturas prehispánicas exhibidas en la base de exhibición no recibieron el respeto merecido. Más bien, recibieron algunos daños por el vandalismo de los pobladores de la misma comunidad y tal vez también por algunos visitantes. Por ello, continuamos más pláticas explicando la importancia y el valor que tiene el patrimonio arqueológico de la comunidad y pidiendo la protección del mismo.

Después de la Temporada 2015 de las excavaciones, el PAER tuvo un tiempo de pausa hasta los últimos meses del 2019 por el cambio laboral del autor. Sin embargo, siempre estábamos buscando alguna manera para mantener contacto con los pobladores locales realizando algunas pláticas para ellos. También intentamos tener más vínculo con el gobierno municipal para que el ejido San Isidro tenga más apoyos necesarios. Por ello, también comenzamos a dar plática para los ciudadanos de la ciudad cabecera municipal de Sayula de Alemán para informar y explicar la importancia del sitio Estero Rabón y otros sitios ubicados en el mismo municipio. También por el nuevo trabajo del autor, en el año 2018, realizamos una exposición fotográfica sobre la arqueología a través de los resultados del PAER en un museo pequeño de otra ciudad de Córdoba, Veracruz. Después de la exposición los materiales utilizados fueron entregados al ejido de San Isidro para que ellos también tengan la misma información (Figura 15). Sin embargo, durante estos años, se notó la dificultad de fortalecer la protección del patrimonio arqueológico en la comunidad San Isidro y estábamos buscando alguna otra estrategia para mejorar la situación.

En el mes de septiembre del 2019, el PAER comenzó una nueva investigación con el apoyo del gobierno de Japón[5]. Esta ocasión nos enfocamos más al aspecto social o desarrollo local de la comunidad de San Isidro. El objetivo principal fue buscar y ofrecer alguna estrategia para construir o reconstruir la identi-

Figura 14. Fotografía de la construcción final de la base de exhibición de las esculturas prehispánicas en el año 2015.

Figura 15. Foto de la entrega de material de la exposición fotográfica.

dad local de la comunidad San Isidro a través de la Arqueología Pública utilizando los recursos arqueológicos, ya que desde el inicio del PAER nos habían contado los pobladores sobre la falta de la identidad propia y local. También nos dio la cuenta que varios pobladores observados en la comunidad carecen de suficiente vínculo con los recursos arqueológicos del sitio Estero Rabón para ser los guardianes del patrimonio arqueológico de su comunidad. Esta situación ha tenido el origen en la historia de la comunidad, ya que este ejido fue aparecido en los principios del siglo XX por unas familias de otras regiones como "migrantes" a esta región. Los primeros pobladores del ejido de San Isidro crecieron en otra región, con otras tradiciones teniendo una identidad propia relacionada con su origen. También después de la fundación del ejido, llegaron otras familias creciendo la población del ejido. Así, para los adultos grandes de la comunidad no hubo un vínculo ideológico fuerte y directo con el terreno que actualmente están viviendo. Asimismo, consideramos cierta relación con la situación actual que los pobladores de la comunidad San Isidro no tienen suficiente interés en el patrimonio arqueológico de la región por ésta misma razón de ser como migrantes de otras regiones. Pero también ya están aumentando las nuevas generaciones que nacieron y crecieron en este territorio. Esta situación actual nos parece que está apareciendo como una oportunidad de construir o reconstruir nueva identidad vinculando fuertemente con el terreno, más bien con el patrimonio arqueológico (el sitio arqueológico Estero Rabón).

La estrategia original de la nueva investigación es ofrecer nueva información recolectada por nuevas excavaciones en el sitio arqueológico Estero Rabón a los pobladores del ejido San Isidro. Sin embargo, por la pandemia mundial del Covid-19 comenzado en los primeros meses del 2020, se modificó la estrategia sin las excavaciones utilizando los datos obtenidos de las excavaciones anteriores por distintas actividades presenciales y virtuales.

Las actividades presenciales fueron las siguientes; unas encuestas sobre la identidad y conocimientos arqueológicos de los pobladores del ejido San Isidro, unas pláticas sobre el sitio Estero Rabón y su importancia, entrega de un texto pequeño

preparado por el PAER sobre el patrimonio arqueológico de la región para los niños y adultos, y una construcción de la protección de las esculturas prehispánicas resguardadas en el ejido. Éstas actividades presenciales solamente se realizaron en el mes de enero de cada año cuando el autor y sus colaboradores tuvieron la oportunidad de visitar al ejido San Isidro.

Las encuestas fueron diseñadas para comprender y observar el desarrollo del fortalecimiento sobre la construcción de la identidad y los conocimientos arqueológicos de los pobladores del ejido San Isidro a través de nuestras actividades de divulgación (Figura 16). Las pláticas fueron realizadas en una tarde en el mismo ejido buscando la mayor participación de ellos con algunos temas relacionados con el sitio Estero Rabón para que conozcan o profundicen los conocimientos sobre su propio patrimonio arqueológico con la esperanza de que la información sea útil para construir o reconstruir su identidad local. Después de la plática del año 2021, con el apoyo del gobierno municipal, entregamos un texto sobre el patrimonio arqueológico de la región a cada familia de la comunidad San Isidro. El texto fue redactado por los miembros del PAER a través de los estudios previos de la región y del PAER para que los niños y adultos conozcan la información básica del patrimonio arqueológico de la región (Figura 17). En la tercera y última visita realizada en el año 2022, aprovechamos la visita a cada familia para apoyar a responder las encuestas y realizamos un registro fotográfico de las piezas arqueológicas coleccionadas y resguardadas en su casa (Figura 18). También después de la plática del 2022, realizamos un torneo del juego de "Lotería" elaborado por el PAER para los niños de la comunidad (Figura 19). Como hemos detectado algunos problemas para la protección de las esculturas prehispánicas en la comunidad, decidimos poner una protección alrededor de la base de exhibición de las piezas y colocar una lona de explicación de todas las esculturas olmecas encontradas del sitio, aunque algunas están fuera del sitio (Figura 20).

Además de éstas actividades presenciales, también realizamos varias actividades virtuales y complementarias; crear rompecabezas digitales en una página de internet con las fotografías tomadas del PAER (por ejemplo, objetos excavados y trabajos realizados en campo y laboratorio) publicando en la página del PAER en Facebook[6], divulgación informática sobre la arqueología y la cultura olmeca vía la misma página de Facebook, y también creamos y abrimos una exposición fotográfica virtual en el internet[7]. Estás actividades no las habíamos planeado desde el inicio de esta nueva investigación del PAER, pero fue necesario desarrollar por la pandemia del Covid 19 que nos obligó a estar en nuestra casa durante largo tiempo.

Consideraciones finales: planes para el futuro

Como manera de concluir el presente texto, se mostrarán algunas consideraciones sobre los hechos del PAER para planear investigaciones futuras relacionadas a los objetivos fundamentales del proyecto.

1. Aunque hemos realizado varias excavaciones en el sitio arqueológico de Estero Rabón, todos los datos excavados por el PAER están relacionados con la fase Villa Alta del periodo Clásico Tardío y Terminal. No tenemos datos relacionados a la sociedad olmeca, aunque la meta del proyecto es reconstruir la vida de los olmecas de bajo y medio rango social de esa sociedad. Sin embargo, los datos excavados por el PAER brindaron mostrar una historia dinámica del sitio durante la fase Villa Alta que no habíamos tenido suficiente información para explicar esta sociedad posterior de la sociedad olmeca [Kotegawa

Figura 16. Fotografía de realización de las encuestas.

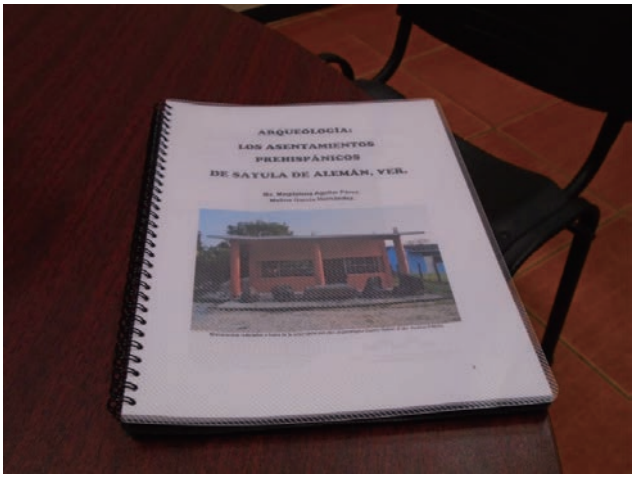

Figura 17. Fotografía del texto elaborado por el PAER sobre el patrimonio arqueológico de la región.

Figura 18. Fotografía de registro fotográfico de colección privada de piezas arqueológicas en la comunidad.

Figura 19. Fotografía del torneo del juego "Lotería".

Figura 20. Fotografía de la protección y la lona de explicación de las esculturas prehispánicas del sitio Estero Rabón.

2015; 2017a; 2020]. Además, a través del desarrollo del PAER también se mostraron algunos datos nuevos [Kotegawa 2017b; 2018] y olvidados sobre los olmecas del sitio [Saucedo Zavara 2018]. Sin embargo, todavía nos falta encontrar algún contexto directo de la sociedad olmeca para cumplir la meta del proyecto.

2. Han participado muchos estudiantes mexicanos en su formación para ser una arqueóloga y un arqueólogo aprendiendo las técnicas de trabajo de campo y laboratorio. Algunas de estas técnicas fueron desarrolladas a manera japonesa. También conocieron la situación crítica actual para la protección del patrimonio arqueológico y aprendieron algunas maneras para tratar este problema a través de la ética profesional de los arqueólogos.
3. Hemos intentado varios retos para tratar el tema de desarrollo local a través de nuestra labor arqueológica. Sin embargo, también nos dimos cuenta que es sumamente difícil lograr algún éxito en este aspecto. A través de estos intentos en cuanto al tema, detectamos que el problema fundamental es la manera de comprender y valorar el patrimonio arqueológico de la comunidad por los pobladores y también falta de una iniciativa por parte de ellos. Por ello, no se coinciden nuestras esperanzas por esos intentos y las acciones de ellos como un resultado; por ejemplo, ofrecemos varias pláticas sobre el sitio y la arqueología pero no todos pobladores participan, estamos esperando a ellos en el sitio para explicar los hallazgos y nuestro trabajo pero casi nadie viene, construimos la base de la exhibición de las esculturas prehispánicas para que les den un respeto adecuado pero utilizan las esculturas como mesas y bancas para tomar cervezas tirando las basuras alrededor y en el peor caso estuvieron vandalizando a las piezas… Tal vez, hay que buscar algunas otras estrategias continuando estos retos para cambiar ésta situación [Kotegawa y García Hernández 2017].

Como se mencionó el punto 1 de nuestros logros y tareas en cuanto al aspecto arqueológico, debemos seguir buscando las evidencias olmecas del sitio si hubiera funcionado realmente como un centro secundario de la sociedad olmeca. Aunque no hemos encontrado la ocupación olmeca en este sitio, a través de revisiones sobre los estudios previos tenemos algunas propuestas e hipótesis sobre esta búsqueda de los datos arqueológicos directos de las actividades de los olmecas en el sitio. Un problema que tenemos sobre la investigación de la sociedad olmeca es que la interpretación sobre esta sociedad fue hecha principalmente por las evidencias encontradas en las capitales o sitios grandes viendo desde la comunidad superior a las inferiores dentro de una

sociedad compleja y jerarquizada. Es necesario corroborar estás interpretaciones a través de las evidencias encontradas de la parte inferior o intermedia de esta sociedad. Por ello, hemos comenzado una nueva etapa del proyecto buscando financiamientos y proponiendo nuevas investigaciones.

Después del cambio laboral del autor en 2016, se disminuyó la participación de los estudiantes y jóvenes arqueólogos mexicanos en el PAER. Pero el objetivo educativo del proyecto todavía está vigente. Podemos recibir algunos estudiantes o jóvenes arqueólogos para que aprendan arqueología por el PAER. Por supuesto también podemos ofrecer los datos para que desarrollen sus estudios como tesis de distintos niveles y algunos artículos de estudios particulares.

Sobre el objetivo de apoyar el desarrollo local de la comunidad, también hemos observado algunas buenas influencias a los pobladores a través de nuestras actividades realizadas con ellos. Desde el momento del comienzo del PAER, hubo algunos pobladores interesados sobre la cultura antigua de su comunidad, aunque fueron pocos están aumentando un poco más. Los niños crecieron con el PAER conociendo y acercándose a los conocimientos arqueológicos.

Los pobladores tienen interés en el patrimonio arqueológico, pero sólo están viendo algunos beneficios económicos imaginando que se les caerán "monedas" desde el cielo. Hemos explicado este punto de vista erróneo durante una década a través de conversaciones cotidianas y en las pláticas del PAER, pero ellos no tomaron en cuenta seriamente lo que les decimos sobre este aspecto. Este intento puede ser un punto de partida, pero es necesario desarrollarlo de la manera correcta con los especialistas del tema, por ejemplo, el desarrollo local, el turismo, y la educación, etc. Esperamos que no hemos hecho mal, pero parece que los pobladores no nos escucharon seriamente porque no somos especialistas de este tema. También por la última investigación realizada por el PAER, nos dimos cuenta que para ellos todavía no es adecuada la divulgación vía internet por falta de infraestructura y la economía de la región. Hubo más participación presencial que acercamientos virtuales durante esta investigación. Hay que buscar otras y nuevas estrategias para este aspecto en el futuro.

Para cerrar esta conversación sobre contribuciones de los arqueólogos japoneses en Mesoamérica por mi punto de vista, la manera del quehacer arqueólogo o realizar investigaciones arqueológicas por los arqueólogos japoneses está cambiando en esta región porque los primeros arqueólogos llegaron solos y desarrollaron sus estudios individualmente. Pero gracias a ellos, las siguientes generaciones estamos recibiendo grandes apoyos de ellos, aunque lleguemos solos en esta región, no nos sentimos solos. Por ello, están llegando más y más arqueólogos japoneses jóvenes a la región mesoamericana. Debemos mantener esta tradición de los arqueólogos japoneses en Mesoamérica, ya que, como otros autores de este volumen, muchos arqueólogos japoneses están contribuyendo con muchos valiosos estudios en las investigaciones arqueológicas en Mesoamérica, pero también ellos siempre están dejando importantes huellas en las sociedades locales.

Notes

1. Las capitales olmecas se categorizan sólo en estos dos sitios por distintas razones: como la dimensión y volumen del sitio, la cantidad de esculturas olmecas de gran escala, etc. Particularmente toma importancia la presencia de cabezas colosales y tronos grandes en el mismo sitio. Por esta razón, el sitio Tres Zapotes no se considera como una capital olmeca por falta de la presencia de tronos grandes, aunque se han encontrado cabezas colosales.
2. Fue otorgado por Ayudas a la Investigación Científica (KAKENHI) del Ministerio de Educación, Cultura, Deporte, Ciencia y Tecnología de Japón a través de la Sociedad Japonesa para la Promoción de la Ciencia. "Reconstrucción de la identidad en la sociedad de migrantes a través de la Arqueología Pública con el patrimonio arqueológico" (19K23119).
3. Entre estas dos ocupaciones distintas se detectó un posible basamento bajo (unos 20 cm de altura), pero no está muy claro si fue otra ocupación o una parte del sistema constructivo del basamento posterior. Por ello, en este momento se trata como una parte del basamento posterior.
4. Según la prueba de la densidad de los materiales, estas piedras verdes son de serpentina. En esta región de costa del Golfo de México no se encuentra un yacimiento de serpentina. Esto significa que estas rocas o productos fueron importados de otra región.
5. La investigación se titula "Reconstrucción de la identidad en la sociedad de migrantes a través de la Arqueología Pública con los patrimonios arqueológicos". Fue financiada por "Ayudas a la Investigación Científica (KAKENHI) del Ministerio de Educación, Cultura, Deporte, Ciencia y Tecnología de Japón a través de la Sociedad Japonesa para la Promoción de la Ciencia" (19K23119).
6. Si tienen interés en conocer nuestra página, por favor hagan una búsqueda en Facebook con el nombre del Proyecto Arqueológico Estero Rabón.
7. Para poder acceder a la exposición es necesario un registro gratuito en la página. Intentamos mantener la exposición ac-

tiva y abierta, pero es dependiendo de la situación económica del PAER para mantener el pago del servicio. La dirección es la siguiente: https://peopleartfactory.com/g/erQeYFjDHrpsd-faC2XOi

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Una perspectiva sobre el problema de la invasión ilegal de los vendedores locales en la Zona Arqueológica de Chichén Itzá, Yucatán, México

Shigeki Shakuya

1. Introducción

Chichén Itzá es uno de los sitios arqueológicos de la Civilización Maya muy famosos por todo el mundo, que se encuentra en la parte medio oriente del Estado de Yucatán, México (Foto 1). Al entrar en la zona arqueológica, los turistas pasan por el pasillo a lo largo del que se colocan los puestos de artesanía en ambos lados antes de ver las pirámides. Estos puestos son de los vendedores que vienen de unos pueblos cerca de la zona, así como Pisté, Xcalacoop, San Francisco Grande, que pertenecen al municipio de Tinum. Este negocio de ellos dentro de la zona es ilegal, por eso este asunto generalmente se llama "la invasión ilegal de los vendedores locales". La invasión empezó en el fin del año 2004 y sigue hasta la fecha sin ninguna solución, pasando un término de suspensión temporal bajo la infección por la COVID-19. Y actualmente, en la temporada alta, se dice que más de un mil de los vendedores locales colocan sus puestos al borde de la zona, formando el paisaje ordinario de la zona arqueológica (Fig. 1). Me parece que los vendedores locales no intenten a molestar a los visitantes, por lo tanto, para los turistas las compras de artesanía serían una de las buenas atracciones en la zona (Foto 2).

Pues aquí, vamos a considerar porqué el problema de la invasión de los vendedores locales en la zona arqueológica de Chichén Itzá quede sin solución por largo tiempo hasta ahora a pesar de su ilegalidad, teniendo en cuenta varios intereses de los actores, así como de la parte de los poderes públicos administrativos o de la parte de la industria turística.

Foto 1 Chichén Itzá (agosto 2017, tomado por el autor)

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2. Particularidad de la posición geográfica de Chichén Itzá

La zona arqueológica de Chichén Itzá actualmente recibe unos dos millones de visitantes al año. Sin embargo, la mayoría de estos visitantes viene de los "resorts" como Cancún o Riviera Maya que están a la orilla del Mar Caribe y pertenecen no al Estado de Yucatán sino de Quintana Roo. Estos destinos turísticos han recibido más de dieciséis millones de visitantes en 2017 y su escala económica es diez veces más grande que la del Estado de Yucatán. Aquí llamamos "el Territorio turístico de Cancún-Riviera Maya" al área dentro del que los turistas que se queden en Cancún o Riviera Maya puedan recorrer en un día. Podríamos decir que esta área es el territorio del turismo "Super-masivo" (Fig. 2), en el que todo lo que pasa se avanza bajo el principio de economía, siguiendo el interés de los turistas. Por eso, las empresas turísticas, así como hoteleros, operadoras de los tours, agencias de viaje, transportes y otras que tienen base de negocios en esta región costera, son muy poderosas y tienen mucha influencia al turismo patrimonial del sitio Chichén Itzá.

Es que el punto de lugar donde existe la zona arqueológica de Chichén Itzá está en condición particular; se encuentra en el punto de intersección de los dos diferentes territorios, o sea mientras está en el Estado de Yucatán, la zona pertenece al Ter-

Foto 2 Uno de los puestos de los vendedores locales en la zona (febrero 2018, tomado por el autor)

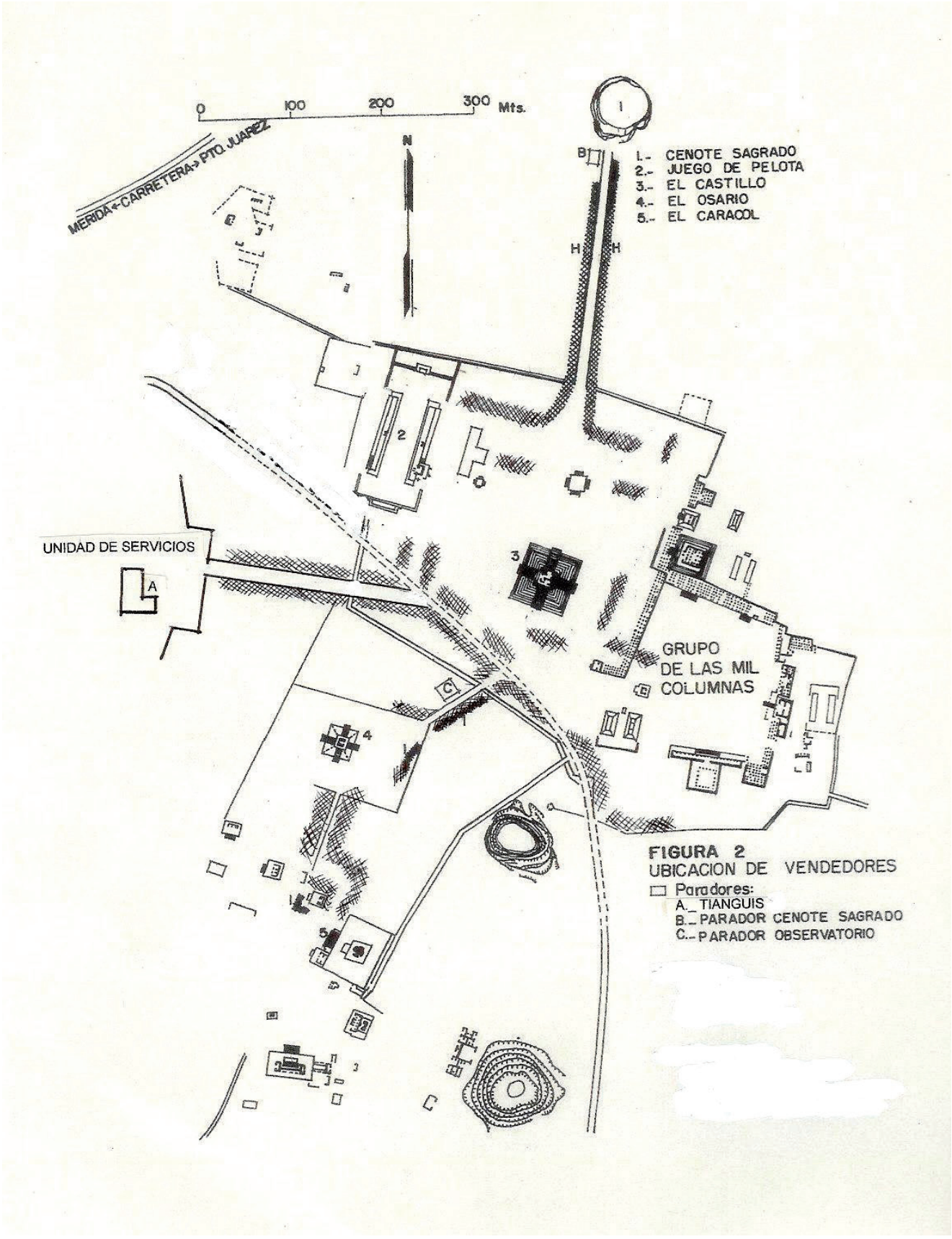

Fig. 1 Ubicación actual de los vendedores en la zona arqueológica (Modificado de Peraza López, et.al, 1987: Fig. 2.)

Fig. 2 La posición de Chichén Itzá

ritorio turístico de Cancún-Riviera Maya en que sea posible un recorrido dentro de un día desde grandes destinos turísticos en el Estado de Quintana Roo.

3. Los actores interesados a la zona arqueológica de Chichén Itzá

En diciembre de 1988, el sitio arqueológico de Chichén Itzá fue inscrito en la lista del Patrimonio de la Humanidad de UNESCO, con el título de “Ciudad Prehispánica de Chichén Itzá”. En la mitad de la década 80 antes de la inscripción, había unos 600 vendedores locales en Chichén Itzá, de los que el Instituto Nacional de Antropología e Historia (INAH) hizo investigación en 1986 para comprender su mala influencia o daño a los edificios y sacbé (Peraza López et.al.1987). Y al ser inscrito al Patrimonio Mundial, el INAH los forzó a los vendedores a moverse al Mercado de Artesanía puesto junto a la entrada principal del sitio, fuera del recinto (Castañeda 1996: 232-258). En aquel entonces, el INAH se encargaba de la administración total de la zona, y la familia Barbachano, que era pionero del turismo en la Península de Yucatán y era el dueño de la empresa Mayaland Tours (Mayaland Tours 1940, Mayaland Resorts n.d., Shakuya 2004: 6-7), tenía influencia muy fuerte a la industria turística de la parte norte de la Península de Yucatán. El traslado de los vendedores fue posible en base de las relaciones relativamente buenas de estos dos partes, bajo el gobierno estatal del PRI.

Hasta el fin del año 2004 en el que nuevamente ocurrió la invasión ilegal de los vendedores locales, la circunstancia política y económica que rodeaba la zona había cambiado mucho, y la responsabilidad en la política de los bienes culturales y del turismo se habían transferido de los poderes federales a los estados (JICA and SECTUR 1997: 3-47), y además el PRI que había estado en la posición dominante en la política de la región yucateca se había ido debilitando en la década de 90. Y al entrar en el siglo XX, gradualmente se fue empeorando la relación entre el gobierno del estado y la familia Barbachano. En aquel entonces, también por el desarrollo turístico muy rápido de Cancún y Riviera Maya (Shakuya 2004: 14-27), muchos empresarios turísticos, así como operadoras de los tours, transportes y otros, nuevamente se participaron al turismo patrimonial de Chichén Itzá. Se podría decir que, en esa temporada de los cambios, la

inestabilidad de la relación de las dos partes, o sea la parte de los poderes públicos administrativos y la parte de la industria turística, causaba la invasión ilegal del año 2004 (Castañeda 2009: 274-275), que es la tercera invasión en la historia del sitio arqueológico de Chichén Itzá. A diferencia de las dos anteriores que hubieron solucionado en dos o tres años, la tercera invasión ha seguido unos quince años hasta ahora y todavía se queda sin solución.

Sin embargo, para considerar por qué el problema siga no resuelto hasta hoy, debemos entender la situación de la zona en que ha seguido estando en equilibrio de poderes de los actores con miradas especulativas a utilizarla como recursos turísticos, o sea recursos económicos, políticos, culturales, etc., y en que se ocurren más competiciones u oposiciones de varios niveles entre los actores interesados.

a) Autoridades administrativas públicas:

Actualmente, en cuanto a la administración de la zona, el centro Yucatán del INAH está responsable en los edificios antiguos y otras cosas arqueológicas dentro del recinto, y el Patronato de las Unidades de Servicios Culturales y Turísticos, o CULTUR, que es una organización paraestatal relacionada al gobierno del Estado de Yucatán, está encargado en los servicios turísticos a los visitantes. Para entrar en la zona, ahora los visitantes extranjeros tienen que pagar 85 pesos por el INAH y 486 pesos por el gobierno estatal como admisión general. El valor de 85 pesos que cobra el INAH es la tarifa general para las zonas grandes de todo el país, y su trabajo tiene responsabilidad al valor del sitio arqueológico únicamente como recursos culturales.

Por otro lado, es el CULTUR que está encargado de los servicios turísticos, o sea de las cosas sobre el valor del sitio como recursos turísticos, más bien económicos. La sede del CULTUR en Mérida ha tenido que tomar medida cada vez que hubiera algo acerca de los problemas de la invasión ilegal de los vendedores locales.

Hasta 2010, el CULTUR cobraba la tarifa de admisión, pero ahora la cobra la Secretaria de Hacienda del Gobierno del Estado, o sea que el beneficio del turismo de Chichén Itzá entra directamente en la caja de la sede central del gobierno del estado. Este cambio era de acuerdo con la publicación del Plan Maestro Chichén Itzá por la gobernadora de entonces del estado, Ivonne Ortega, que dedicaba a construir un circuito de integración regional para fomentar el turismo y la cultura del estado (Shakuya 2015: 125-126) (Fig. 3), y al mismo tiempo el gobierno estatal realizó en Chichén Itzá la expropiación de 83 hectáreas de tierra de la zona arqueológica de la familia Barbachano (Shakuya 2015: 122). Por la solicitud del gobierno a realizar el Plan, el CULTUR que tiene posición inferior al gobierno estatal se sentía siempre presionado (Fig. 4).

Pero es interesante que lo que piensa la oficina del CULTUR en la zona de Chichén Itzá es diferente que la sede en Mérida. Cuando yo hice una entrevista al representante de la oficina de Chichén Itzá en noviembre de 2014, él me manifestaba que la oficina de la zona no tenía ninguna relación a la realización del Plan Maestro. Y también en cuanto al problema de la invasión ilegal de los vendedores locales, tomaba una actitud ambigua, diciendo que el Plan Maestro sería una idea razonable para el estado, pero habría otra idea que se debía respetar los derechos de la gente local que había vivido hace mucho tiempo junto con el sitio arqueológico de Chichén Itzá (Shakuya 2015: 126). Aquí se podría observar la lógica de la sociedad local contra la del centro, aparte de la lógica dentro del CULTUR como organización pública.

b) Industria turística:

Por otro lado, la familia Barbachano que es dueño de varios hoteles alrededor de la zona, así como Hotel Mayaland, Hotel Hacienda Chichén, Hotel Chichén Itzá y otros, había tenido gran influencia a la industria turística de la región por largo tiempo. Pero por el desarrollo de Cancún aparte de la década 70 (Clancy 2001: 58-59, García de Fuentes 1979: 81-93, Gormsen 1982: 47-55, Torres Maldonado 2000: 186, 195, Shakuya 2004: 9-14) y de Riviera Maya desde hace unos 20 años (FONATUR 2000, Shakuya 2004: 18-27), nuevas empresas entraron, una tras otra, a los negocios del turismo, la influencia de la familia Barbachano relativamente ha ido disminuyendo.

Las empresas nuevas del Estado de Quintana Roo están fuera del control de la admisión pública del gobierno yucateca (Fig. 5). El territorio turístico de Cancún y Riviera Maya que recibe más de dieciséis millones de visitantes al año, por eso las empresas de la región costera ahora tiene poder económico enorme y gran influencia al turismo dentro del territorio. Y a veces lanzan quejas muy fuertes al CULTUR sobre los vendedores locales dentro del recinto de Chichén Itzá como menciono después.

4. La estrategia de los vendedores locales como actores interesados a la zona arqueológica de Chichén Itzá

Se dice que actualmente dentro del recinto de la zona hay más de un mil de vendedores locales en la temporada alta del turismo. Ellos vienen principalmente de tres comunidades que pertenece en el municipio de Tinum, o sea Pisté, Xcalacoop y San Francisco Grande (Fig. 6). En el pueblo ellos se hablan en idioma maya

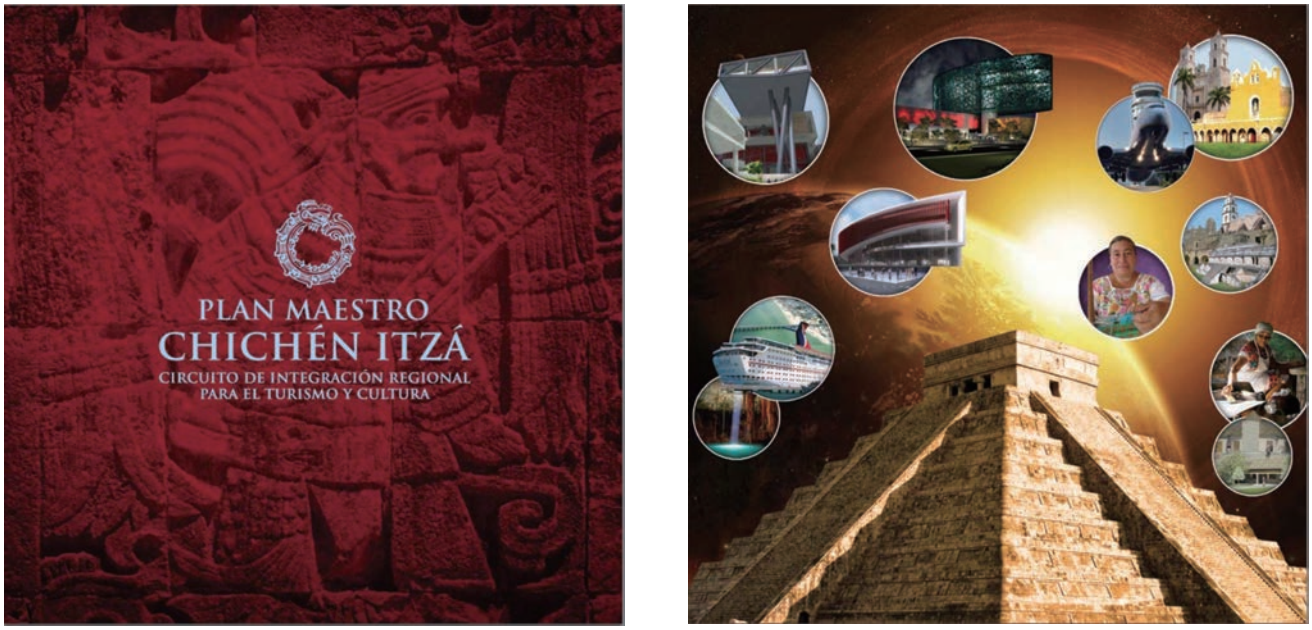

Fig. 3 El folleto del Plan Maestro Chichén Itzá (una parte)

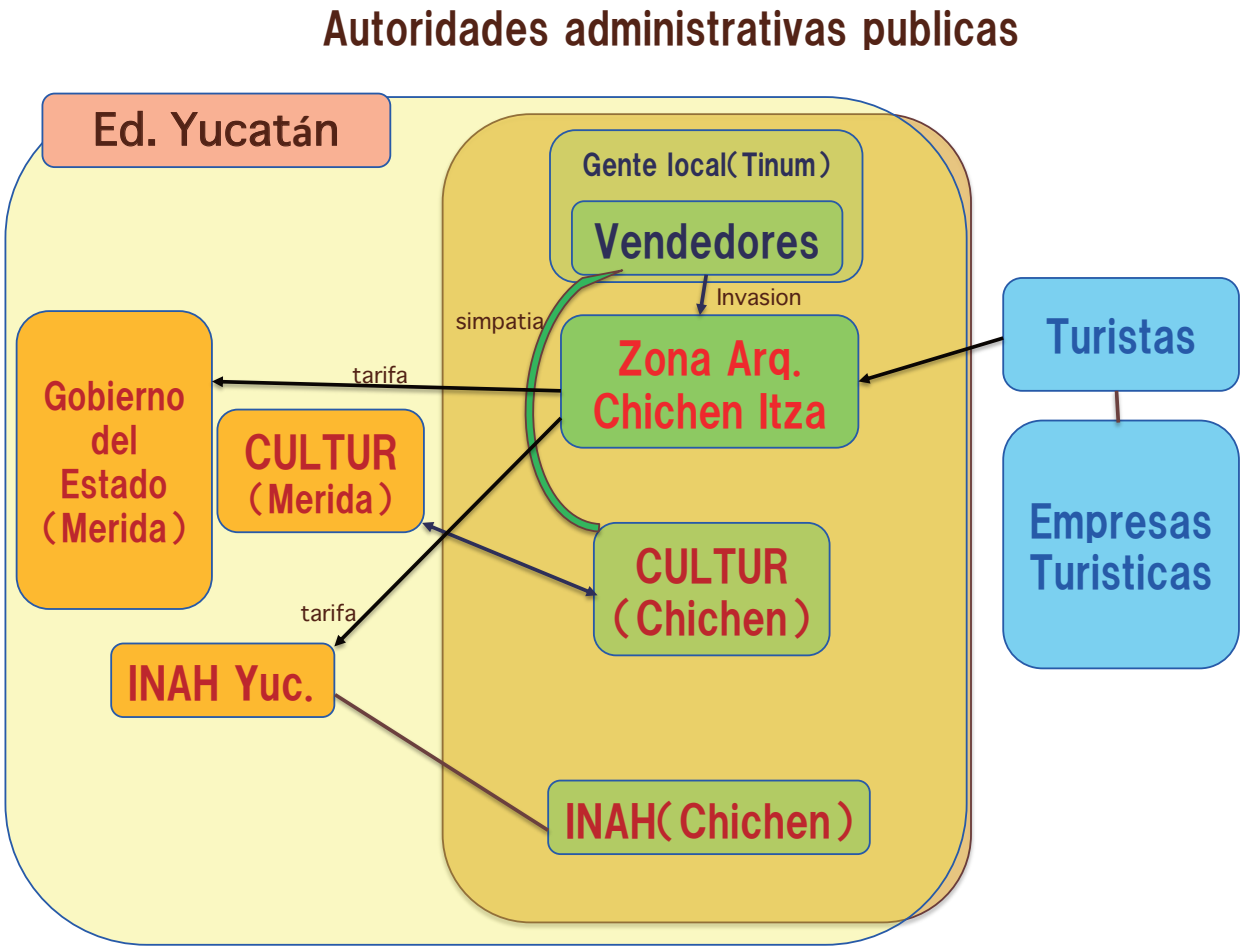

Fig. 4 Relaciones de las autoridades administrativas públicas

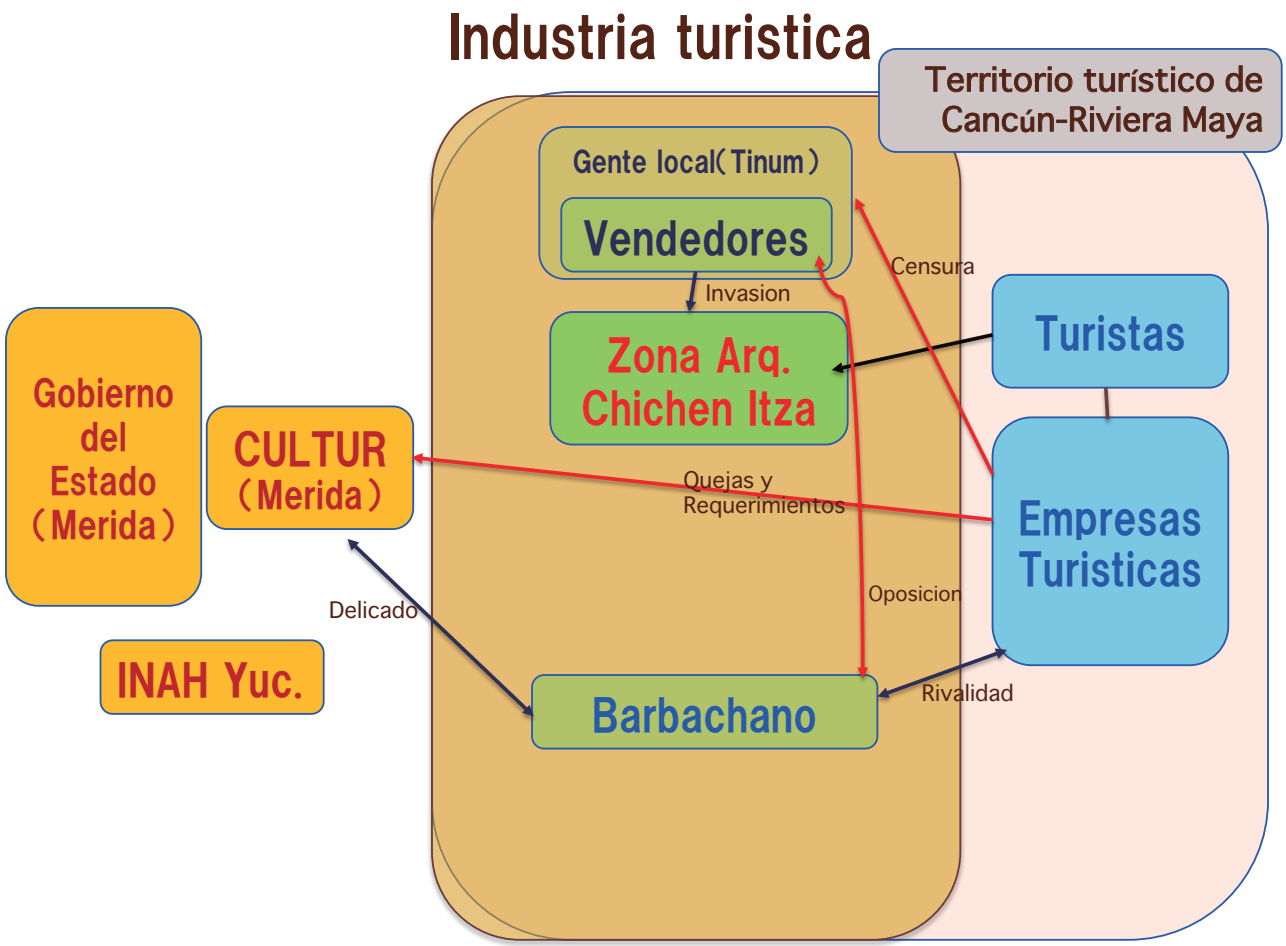

Fig. 5 Relaciones de industria turística con Chichén Itzá

y tienen identidad étnica como maya. Pero es muy interesante que las cosas vendidas por ellos aquí en este parque en que se está exponiendo los restos de la gloriosa civilización Maya no siempre sean las cosas con elementos procedentes de la cultura maya, y a veces veamos trozos de otras culturas como aztecas, europeas, etc. en las cosas mostradas en los puestos (Shakuya 2015: 124) (Foto 3).

Como mencionado arriba, sus negocios dentro de la zona son ilegales, y los vendedores siempre se han preocupado y asustado de que la autoridad les excluyera de repente. Por lo tanto, ellos organizaron sindicatos para guardar sus negocios y su vida. Se dice que actualmente hay dos o tres sindicatos, y el más grande que se llama "Nueva Kukulkán" contiene unos 700 miembros. Los líderes y los abogados de este sindicato a veces salen a unas medias como periódicos o programas de noticias de televisión, reclamando el aseguramiento de la vida de los miembros o las quejas para el gobierno estatal. Ahora los sindicatos de los vendedores están estableciendo y fortaleciendo su posición social con carácter de unión política. Y es interesante que el oponente a que ellos negocian sea principalmente la sede de CULTUR en

Foto 3 Las cosas vendidas con mezcla de motivos mayas y aztecas (febrero 2018, tomado por el autor)

Mérida. Aquí se podría dar cuenta de la estrategia de los vendedores. Aprovechando con habilidad esta situación con mucha tensión por equilibrio de los poderes de los actores, ellos siguen negocios ilegales dentro de la zona.

En septiembre de 2013, hubo un alboroto en el que los miembros de un grupo encabezado por Juan Pablo Euan Cen,

Fig. 6 Los pueblos arlededores de la zona arqueológica de Chichén Itzá

el dirigente de Nueva Kukulkán, expulsaron del recinto a los de otro grupo de Silvia Cemé Mex, ex dirigente del mismo sindicato. Luego Juan Pablo pidió a Enrique Magadán Villamil, el director de entonces del CULTUR a servir de intermediario para solucionar esa situación.

Al principio, Villamil intentaba a ignorar la solicitud de Juan Pablo como postura general de la autoridad pública porque los negocios de los vendedores son ilegales, pero este suceso gradualmente llamaba más atención por la información periodística, por fin Villamil aprobó a intervenirlo. Por resultado del esfuerzo del director del CULTUR, la situación confusa de los vendedores locales ha solucionado y la zona restableció el paisaje en paz como si hubiera pasado nada. Pero la única cosa que ha quedado es el hecho que la autoridad pública del Estado reconoció oficialmente la posición social de los vendedores locales en la zona arqueológica de Chichén Itzá.

Y después, los vendedores locales siempre han sido objetos de reclamos de los otros actores interesados que querían relacionar a la zona y obtener grandes beneficios. Y para hacer frente a esos casos, los vendedores locales siempre han hablado principalmente con el director del CULTUR en Mérida.

Por ejemplo, en diciembre de 2015, o sea justamente en la temporada alta del turismo en la región norte de Yucatán, ocurrió de nuevo un acontecimiento que alzaba la tensión en el ambiente dentro de la zona acerca del problema de invasión ilegal de los vendedores locales. El principio del caso fue un comentario de Sergio González Rubiera, dirigente en Cancún de la Asociación Mexicana de Agencias de Viaje, que salía el día 17 de diciembre en el periódico El Economista, diciendo “la zona arqueológica de Chichén Itzá está en riesgo de perder el nombramiento como una de las Nuevas Siete Maravillas del Mundo debido a los cientos de ambulantes que la han invadido, pues acosan al turista y han causado varios problemas a las empresas operadoras turísticas que comercializan los tours a la zona”. Y a este comentario siguieron unas palabras a pedir al gobierno estatal de Yucatán solucionar inmediatamente el problema que hubiera empeorado la imagen turística de Chichén Itzá, de la parte de empresas del sector hotelero y turístico de ambos estados de Quintana Roo y Yucatán.

A su vez, se anunció que Juan Pablo Euan Cen, el dirigente de Nueva Kukulkán, probaba una serie de petición contra estos reclamos. Él y sus colegas solicitaron a Rubiera a retractarse

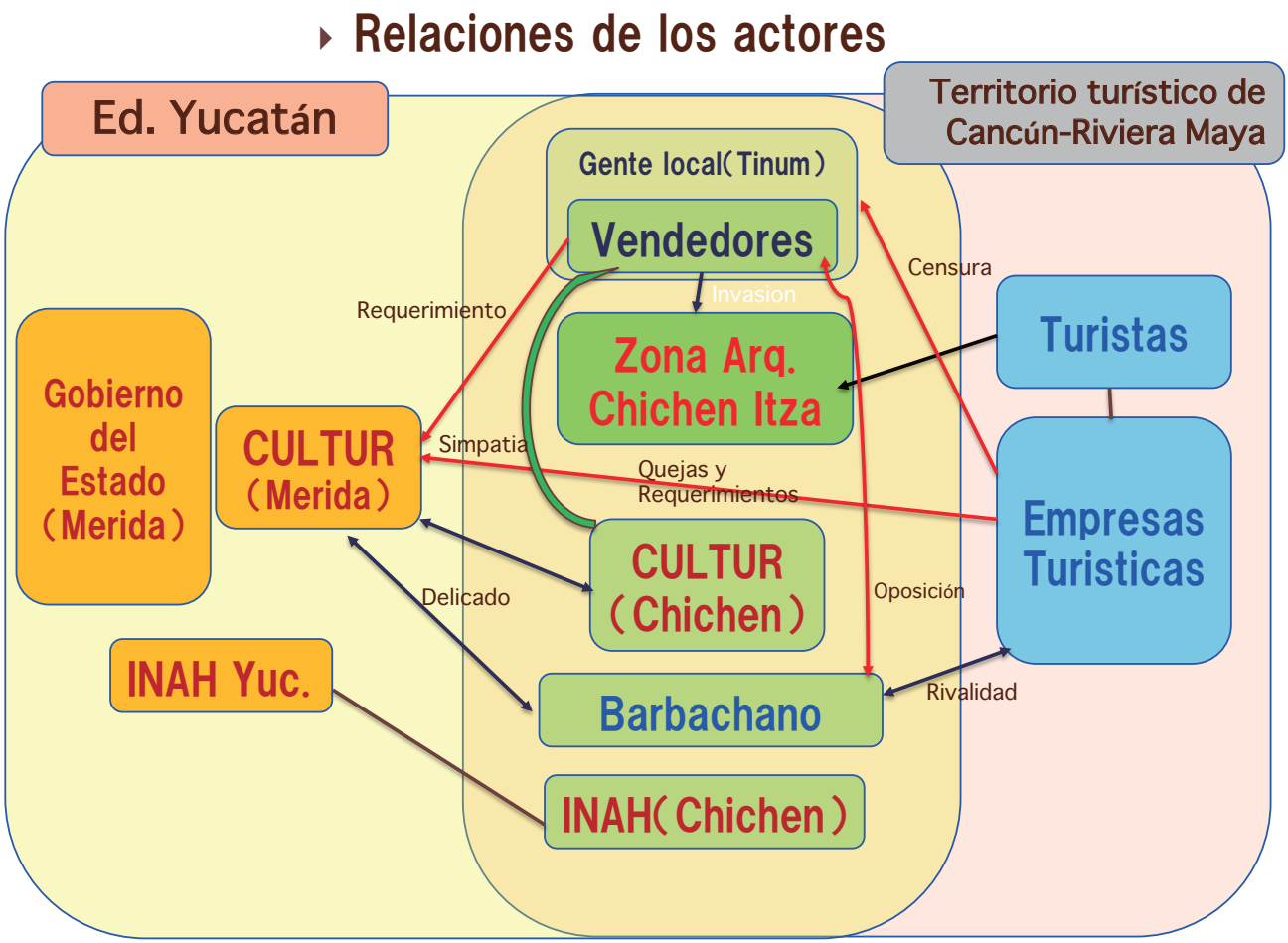

Fig. 7 Relaciones de los actores interesados con Chichén Itzá

públicamente por sus declaraciones, asegurando que la Organización de Nuevas Maravillas del Mundo no había emitido ningún comentario sobre este asunto. Y ellos pidieron a la Organización de Nuevas Maravillas del Mundo ubicada en Suiza que evaluara si su presencia en el sitio afectara Chichén Itzá. Además el sindicato solicitó a Dafne López Martínez, el ex-director del CULTUR a hacer diálogos para reconocer formalmente su espacio de trabajo al interior de la zona arqueológica, a exigir al INAH y otras autoridades expropiar unas 700 hectáreas de tierra con propiedad de la familia Barbachano alrededor de la zona arqueológica de Chichén Itzá, y a reclamar 15 por ciento de los ingresos que captaban CULTUR e INAH como parte de ellos con el fin de aprovechar para el desarrollo del municipio de Tinum en que viven los vendedores.

En esta situación de discordia entre dos partes, aun tomando posición algo favorable a la gente local, CULTUR ni INAH no tomaron ninguna medida en particular y sólo observaron durante unos meses el curso de los acontecimientos, hasta que se pacifique como si hubiera pasado nada.

En el sitio arqueológico de Chichén Itzá no son raros tales acontecimientos semejantes como esta vez, en que al principio unos empresarios turísticos acusan a los vendedores locales con unas palabras agresivas, y se empeora el ambiente en la zona, pero luego con el tiempo que pasa, finalmente se va a normalizar. Y también las medidas correspondientes tomadas por las autoridades administrativas, como CULTUR e INAH, siempre parecen ser casi igual y no cambia nada como consecuencia.

5. Conclusión

Hacia la zona arqueológica de Chichén Itzá se echan varias miradas especulativas de los actores interesados a los negocios turísticos. Esas miradas a buscar beneficios siempre hacen a los actores a competirse y oponerse, y se forma una situación con una clase de tensión dentro de la zona (Fig. 7). Se parece que los vendedores locales hayan tenido buen resultado en la comunicación con el director del CULTUR aprovechando con habilidad esa situación, y al fin llevaron a cabo la substitución de la ilegalidad de sus negocios en la zona a sus derechos de la gente

local.

Aparentemente los vendedores locales tratan a la zona arqueológica como recursos económicos. Claramente ellos podrían reclamar que el sitio arqueológico de Chichén Itzá sea un símbolo de su cultura materna, pues que ellos son mayas. Pero ellos parecen que no presten tanta atención a las actividades de utilizarlo al sitio arqueológico como recursos culturales. Si ellos hubieran puesto el significado del movimiento cultural en ol frente de este asunto, sus actividades se hubieran caído en un instante bajo dominación de los intereses económicos muy fuertes de varias partes, sin consejero válido como CULTUR y los puestos ilegales de ellos hubieran expulsado muy pronto fuera del recinto por la autoridad administrativa. Por eso, para reclamar sus derechos y mejorar su vida, ellos parecen que se atrevan a elegir estratégicamente la manera política de relacionar con la zona arqueológica de Chichén Itzá.

Nota: Este estudio fue parcialmente apoyado por JSPS KAKENHI Grant No. 26101005, 125K21760 y 19K12551.

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Becoming Mesoamerican archaeologists and recognized worldwide: A text mining analysis of Japanese scholarship

Akira Ichikawa and Misaki Fukaya

Introduction

Japanese scholars have been working on Mesoamerican archaeology, including the Maya region, for several decades. Nowadays, these accomplishments have been published and broadly recognized in academia and by the general public. For example, Professor Seiichi Nakamura is one of the Japanese pioneers in field-based Maya archaeology since the mid-1980s. He directed the first long-term archaeological project organized by Japanese scholars, known as the La Entrada Archaeological Project [e.g., Nakamura, Aoyama, and Uratsuji eds. 1991]. This project focused on archaeological research and also the conservation of pre-Hispanic architecture and its use to establish a better life for local people. This flow of project management continues to the present day in projects run by Japanese scholars. Furthermore, through this project, several young enthusiastic archaeologists at that time such as Takeshi Inomata, Kazuo Aoyama, and others rose to become very well-known Maya archaeologists in academia.

This paper aims to explain how Japanese scholars became Maya and more specifically internationally recognized Mesoamerican archaeologists. To date, Japanese scholars have published more than 900 items on this topic in different languages. We examine what kind of research topics Japanese scholars focused on, and how they were recognized and contributed to Maya studies, using a text mining analysis of 161 published papers by Japanese scholars. Collectively, the Maya regions of Central America are the main research target for Japanese scholars but they include other areas in Mesoamerica such as the Central Highland of Mexico, the Gulf Coast, Oaxaca, and peripherical areas like El Salvador and Nicaragua because the Maya civilization was not isolated from other areas in Mesoamerica and its interactions with those areas provide clues to understand the rise and fall of the Maya civilization. Additionally, this study includes works by Japanese scholars from vast regions of Mesoamerica to highlight a variety of Japanese scholars in Mesoamerican archaeology (Figure 1).

Several researchers have introduced research history of Japanese archaeologists in Mesoamerica [e.g. Aoyama 2002; Ichikawa 2014], but this study is the first to use a text mining analysis to quantitatively clarify the research topics and periods prioritized by Japanese scholars in Mesoamerican archaeology through the time. Additionally, this study argues that the text-oriented digital humanities is a useful tool for a quantitative review of research history in this big data era.

Historical background: Japanese scholars in Mesoamerican Archaeology

Since the early 1940s, Japanese scholars published more than 900 articles and books about Mesoamerica in different languages such as Japanese, Spanish, and English[1]. According to the overview of those publications, the history of Japanese scholars on Mesoamerica can be divided into four phases, with some overlap.

The first phase: 1950s-1970s

The first phase is an introductory phase. During the late 1950s, 1960s, and 1970s, Japanese scholars provided an overview of ancient civilizations that developed in the New World including the Andes and Mesoamerica in Japanese. *Maya Civilization* written by Eiichiro Ishida is the first comprehensive introduction to the Maya civilization in Japan, it is a significant work, even today [Ishida 1967]. Subsequently, the first translated book from English into Japanese was a watershed examination of the Maya, titled "*Maya*" written by Michael D. Coe, an American leading archaeologist, anthropologist, and epigrapher. It was published in 1975 and translated by Kazuo Terada and Yasutake Kato [Coe 1975]. Takaji Sadasue's work, as a former professor at Kanazawa University, is also substantially meaningful. He published on different and vast topics related to Mesoamerica such as the rise and fall of the Maya civilization, Olmec arts, mural arts, and others [e.g., Sadasue 1984]. The books and papers mentioned above must have sparked the interest of Japanese citizens who were drawn to learn about civilizations that were previously unknown in Japan. The initial works about Mesoamerica focused on introducing general knowledge about ancient civilizations in the New World and any analysis was based mainly on literature reviews.

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Figure 1. Main sites mentioned in this paper (drawn by authors).

The second phase: 1960s-1980s

The second phase involved a few Japanese pioneers who studied Mesoamerican archaeology and joined archaeological projects in Mexico in the 1960s, 1970s, and 1980s. From the late 1960s to the 1980s, Yoko Sugiura conducted archaeological and ethnological surveys in the Toluca Valley, Mexico. She published numerous articles and books regarding lacustrine everyday life, Late Classic collapse, and other topics on the central highlands of Mexico [e.g. Sugiura 2009]. Kuniaki Ohi worked with great Mexican archaeologist Roman Piña Chan at Teotenango during the early 1970s. Importantly, Ohi learned the philosophy of Mexican archaeology, which emphasizes archaeological investigations based on scholars' academic interests and also conserves archaeological sites and contributes to a better life in the local community [e.g. Ohi 2006]. Saburo Sugiyama initiated working at Teotihuacan and then dedicated more than 35 years of his life to the largest metropolis in the New World [e.g. Sugiyama 2005]. Furthermore, Akira Kaneko and Harumi Fujita are also exceptional Japanese pioneers in the history of Mesoamerican archaeology. They obtained bachelor's degrees at the Escuela Nacional de Antropología e Historia (known as ENAH in Mexico). Kaneko has worked in Chiapas since late 1970s at sites such as Yaxchilan, Tonina, Pomona and Iglesia Vieja and is the investigator of Centro de Instituto Nacional de Antropología e Historia (INAH) Chiapas [e.g. Kaneko 2003]. Fujita has been interested in the settlement along the coast and working in Baja California as an investigator of the Centro INAH Baja California [e.g. Fujita and Melgar 2014].

The third phase: 1980s-1990s

The third phase is substantial because it marks the first long-term archaeological project organized by Japanese scholars, known as the La Entrada Archaeological Project (1983-1993), in Honduras. It was organized and directed by young Japanese archaeologists dispatched from the Japan International Cooperation Agency (JICA). Through this historical project, young Japanese archaeologists transformed into field-based Maya archaeologists with Seiichi Nakamura, Takeshi Inomata, Kazuo Aoyama, Shuichiro Terasaki, Etsuo Sato, and Etsuo Hasegawa directing projects. On the La Entrada project, they carried out a systematic survey of the La Entrada region and conducted the excavation and conservation of the El Puente site. Recently, El Puente was opened as an archaeological park and made a significant contribution to the development of the local community and conservation of local cultural heritage and identity [e.g. Nakamura and

Uratsuji eds. 1991]. Subsequently, those archaeologists emerged from the project having conducted remarkable studies in different areas of western Honduras including Copan [e.g. Aoyama 1999; Schortman and Nakamura 1991] and Aguateca, Guatemala [e.g. Aoyama 2009; Inomata 2008]. Those accomplishments were published in different languages and gradually became recognized in academia.

Another project organized by Japanese scholars emerged with support from the Tobacco and Salt Museum, Tokyo. This project was directed by Kuniaki Ohi, with participation from Nobuyuki Ito, Shione Shibata, and others from 1991-1994 at Kaminaljuyu, Guatemala, which has large Preclassic and Classic occupations [e.g. Ohi ed. 1994]. Afterward, this research group shifted their main research field area to Chalchuapa, El Salvador. They excavated and reconstructed earthen monumental architectures in the Casa Blanca group from 1995-2000 [e.g. Ohi ed. 2000]. Importantly, thanks to a considerable effort, part of the Casa Blanca group was opened as an archaeological park with support from the El Salvadoran and Japanese organization.

In 1996, a Japanese academic research group on ancient America emerged from a substantial increase in Japanese scholars of Mesoamerica and Andean Archaeology. This research group became the Japan Society for Studies of Ancient America in 2003.

The fourth phase: 2000-Present

The fourth phase, starting around 2000, comprised several Japanese archaeologists including new generations conducting international and interdisciplinary projects in vast areas of Mesoamerica. Inomata and Aoyama's work at Ceibal, Guatemala, and Aguada Fenix, Mexico had a significant impact on researches about the origin and collapse of the Maya civilization [e.g. Aoyama et al. 2017; Inomata et al. 2013, 2017, 2020]. Those works are interdisciplinary including radiocarbon dating, paleoenvironmental studies, bioarchaeology, isotopic studies, and LiDAR[2] so far [e.g. Inomata et al. 2018; Sharpe and Aoyama 2022]. Saburo Sugiyama directed/codirected several projects at Teotihuacan for decades including at the Temple of Quezalcoatl, the Sun and Moon Pyramids, the architectural complex of the Plaza de Las Columnas [e.g. Sugiyama S. 1989, 1993, 2005; Sugiyama and Cabrera Castro 2007l; Sugiyama N. et al. 2013]. This project also clarified aspects of the urbanization process, religion, symbolism, monumentality, the political organization of Teotihuacan, and its social interaction with other Mesoamerican regions. Nakamura has been trying to reveal the early history of two significant Maya dynasties: Tikal, Guatemala, and Copan, Honduras [e.g. Nakamura ed. 2013, 2022]. Additionally, it is important to mention that Nakamura made a huge effort to establish a liaison office at these two world heritage sites and contributed to local community development through archaeology, museology, and international cooperation.

New generations of Japanese archaeologists have emerged in Mesoamerican Archaeology and conducted remarkable projects that cover different areas and periods of Mesoamerican civilization. Many from this generation have participated in projects directed by Japanese scholars mentioned above and obtained Ph.D. degrees from foreign universities and then evolved into project directors based on their research interests. Tatsuya Murakami and Shigeru Kabata carried out several field seasons at Tlalancaleca, Mexico to understand the origin of the large Classic urban centers of Central Highland of Mexico, in other words, an era before Teotihuacan's emergence [e.g. Murakami et al. 2017]. Moreover, they have important publications on power relationships, urban landscape formation, and the collapse of metropolitan Teotihuacan [e.g. Kabata 2010; Murakami 2010]. In the Central Highlands of Mexico, Nawa Sugiyama conducted significant work at Teotihuacan especially based on a zooarchaeological method and perspective [e.g. Sugiyama N. et al. 2017]. In the Maya area, Tsukamoto Kenichiro directed a long-term project at El Palmar, Campeche, Mexico. He discovered hieroglyphic stairways at the Guzman group, located in an outlier architectural complex at El Palmar. Its interpretation sheds light on political negotiation among different social status groups and political interactions including the Calakmul and Copan dynasties [e.g. Tsukamoto et al. 2015]. His first edited book with Inomata Mesoamerican Plaza has innovative theoretical and methodological approaches to understanding this important arena as a place to interact with different people in the Mesoamerican civilization [Tsukamoto and Inomata eds. 2014]. Other important works in Maya archaeology are bioarcheological and isotopic studies conducted by Shintaro Suzuki. He worked in different sites in Mexico, El Salvador, Guatemala, and Honduras and obtained Ph.D. from the Universidad Nacional Autónoma de Mexico (known as UNAM in Mexico). His researches revealed that the Late Classic Copan dynasty might have been a multi-ethnic society, which indicates that multidirectional movements among different cities and coexisting within cities were more common than previously assumed [e.g. Suzuki et al. 2020]. Yuko Shiratori excavated Tayasal and Nixtun-Ch'ich', which are located around Lake Petén Itzá, Guatemala to reveal the Postclassic to the Spanish contact period in the Maya area [e.g. Shiratori 2021]. Reiko Ishihara's work about a cave in a Maya region and Satoru Murata's work

about salt production on the Belizean coast are also significant contributions to Maya archaeology [e.g. Ishihara-Brito et al. 2011; Murata 2011].

There are other remarkable projects conducted by Japanese researchers in other Mesoamerican areas. Hirokazu Kotegawa conducted investigations at Estero Rabon, Veracruz, Mexico to reveal the everyday life of Olmec culture [e.g. Kotegawa 2017]. This project intimately involved local people to establish a community museum with eight Olmec-style carved stone monuments. In Gulf Coast archaeology, Mitsuru Kurosaki is well known as an expert on Yugo, Hacha, and Palma, which have representative material assemblages in the ancient Gulf Coast of Mexico [e.g. Kurosaki 2006]. Moreover, Masakage Murano has a public archaeology project bridging the study of negative Usulután style ceramic, contemporary art, and public engagement [e.g. Murano 2017]. Akira Ichikawa, one of the authors of this paper, has conducted archaeological excavations at Nueva Esperanza and San Andrés and covers different research topics such as sudden environmental change and human adaptation, salt production, the conservation of earthen architecture, and so on [e.g. Ichikawa 2022; Ichikawa et al. 2021]. In El Salvador, archaeologists from JICA volunteered between 2003 and 2014. Murano and Ichikawa were JICA volunteers.

Additionally, Japanese archaeologists expanded to incorporate Nicaragua and Costa Rica. Etsuo Hasegawa, one of the La Entrada Archaeological Project members, conducted archaeological works at different sites in Nicaragua [e.g. Hasegawa 2019]. Also, Hiroshi Minami and his colleagues at the Kyoto University of Foreign Studies were involved in Nicaraguan archaeology combining public archaeology and museology [e.g. Fukaya et al. 2020]. In Costa Rica, Waka Kuboyama conducted experimental archaeological research on the lapidary technology of celtiform pendants [Kuboyama 2022].

Text Mining Analysis

The historical background of Japanese scholars in Mesoamerican archaeology indicates that currently, Japanese scholars have worked across a vast regional area and on different topics regarding Mesoamerican civilizations. Japanese scholars transformed into field-based archaeologists in the late 1970s and 1980s joining projects organized by Mexican or other foreign scholars, and subsequently obtained recognition in the academic world. The La Entrada archaeological project was a turning point in the history of Japanese scholars on Mesoamerica archaeology, even though different academic trajectories exist. This study investigates their research topics and contributions to Mesoamerican Archaeology. Furthermore, it traces how Japanese scholars became recognized in Mesoamerican archaeology. This article asks these questions and identifies the trends and specifics of Japanese scholarship. Thereby, this study provides important information, especially to younger and future generations of Japanese academics and the public. To address these goals, this article uses a text mining analysis of 161 published articles by Japanese scholars on Mesoamerica with English-language abstracts.

Material

It is hard to follow and track all the accomplishments of Japanese scholars due to the wide range of publication types. Japanese Mesoamerican archaeologists have published more than 900 articles in English, Spanish, and Japanese and in different mediums such as journals, proceedings, edited books, and manuscripts.

This article focuses on analyzing 161 English-language abstracts to understand diachronically the research trends and topics by Japanese scholars. Those articles include publications as first author, corresponding author, and co-author. In total, 161 English abstracts yielded 101 English articles in different journals. These English articles were published in the journals listed in the Web of Science and open access journals since the 1980s. Articles in edited books are not included. Furthermore, 60 Spanish articles were published in the series of proceedings of Symposium of Archaeological Investigations, Guatemala. These articles were published between 1986 and 2022. The reason that the authors chose English-language publications is that it is the most common language in academia. Furthermore, English peer-reviewed and open-access articles are ideal materials to understand Japanese scholars' contribution to the international academic discourse. Additionally, Spanish-language publications were chosen because materials printed in this language are an important resource in Mesoamerica archaeology. However, some of this literature may not have English-language abstracts. The Symposium of Archaeological Investigations, Guatemala is an important annual symposium for Mesoamerican archaeologists and has published open-access Spanish-language articles with English abstracts since 2004 on the website of Tikal association[3].

Most of the articles written about Mesoamerican civilizations by Japanese scholars are, of course, written in Japanese. However, many lack English abstracts and are not open access. It would be ideal to analyze all articles published in different languages. However, unifying the data from articles written in different languages remains problematic regarding translation and vocabulary standardization. This should be done in a future

task. Despite this limitation, as shown below, the text mining analysis obtains meaningful results to understand the trends and topics of Japanese scholars in Mesoamerican archaeology.

Method

For text mining analysis we use the KH Coder, which is a free and versatile text mining analysis tool [Higuchi 2016, 2017]. To understand quantitatively the trends and topics of Japanese scholars in Mesoamerican archaeology we use the "Frequency list" and "Co-occurrence analysis." The Frequency list can provide data about main research topics, areas, sites, and periods and their diachronic change over time. To understand diachronic change, we divide the publication years into 5-year increments from the date of the first English article, although the years 1986-2000 are set in one analytical category due to the small sample size. The Co-occurrence Network examines relationships among characteristic words and visually demonstrates those relationships. This study used the top 150 frequent words extracted from all publications. This tool helps clarify what themes Japanese scholars have focused on and contributed to Mesoamerican archaeology. The process of analysis follows.

Data-making is a crucial process for acquiring appropriate data from complex text data so as to meet the aims of the study. After collecting all publications for this study, we entered them into an Excel sheet (.csv file) with data including Text (abstract), Year 1 (1989, 1990, 1991…), Year 2 (1986-1990, 1991-1995, 1996-2000…), Journal, Author(s), and Title. Before running the Pre-screening process, we prepared two text files (.text file), which are "Stop words" and "name," to obtain good results for the analysis. The "Stop words" consists of general and insignificant words in analysis that can be excluded from the analysis such as "a," "the," (articles), "of," "to" (prepositions), "data," "investigation" (noun), "argue," "indicate" (verb), "possibly," "likely" (adverbs), "important," "remarkable" (adjectives), and "which," and "who" (relative pronouns). The "name" consists of words that have one meaning but comprise two words, this mainly applies to proper nouns such as "El Salvador," "San Andres," "El Palmar," and "Late Classic." Once all those file sets are done, it runs a Pre-screening process. However, the Pre-screening process result needs to be revised depending on the nature of the dataset. If needed, Stop words are added and the names are repeated in the Pre-screening process until no meaningless results occur.

After running the Pre-screening process, the KH Coder has different analytical tools to understand the nature and characteristics of word assemblages including the Frequency list, Correspondence Analysis, Hierarchical Cluster Analysis, Co-occurrence Network, and Self-Organization Map. This study uses the Frequency list and Co-occurrence Network. The results and their interpretation are diverse, but this study focuses on the research area, period, and topics so that the reader can easily understand the data.

Results

1) The frequency list of total publications

The frequency list of total publications provides an overview of the trends and topics of Japanese scholars in Mesoamerican Archaeology (Table 1). "Maya" is the most important word including Classic Maya and Maya Lowlands. Even though, as the previous chapter mentioned, Japanese scholars are working in different areas, the data indicates that the Maya are the main focus of Japanese scholars. More specifically, Japanese scholars published articles related to Ceibal, Aguateca, and Copan. Teotihuacan and Chalchuapa also are frequent words about sites. Teotihuacan is the largest urban city in Mesoamerica. On the other hand, Chalchuapa was one of the regional centers in the southern frontier of Mesoamerica. Other words referring to sites in the top 150 are Kaminaljuyu in Guatemala and San Andres and Tazumal in El Salvador. Even though Japanese scholars worked across Mesoamerica, no other sites were listed in the top 150 words.

The most frequent period is the Classic period (250-900/1000 CE), especially the Late Classic period (600-900/1000 CE). The Early Classic (250-600 CE) period is a less frequent period than the Classic period. The next frequent period is the Preclassic period (1800 BCE-250 CE), mainly the Middle Preclassic (1000-400 BCE) and the Late Preclassic (400 BCE-250 CE). The term, Postclassic (900/1000-1521 CE) did not appear in the top 150 frequent words.

Regarding terms related to research topics, the words in the top 20 frequent words are obsidian, structure, production, artifact, center, political, construction, elite, animal, and burial. Subsequent words in the top 100 are exchange, lithic, chronology, public, community, practice, ruler, state, modern, power, radiocarbon, warfare, bone, ceremonial, food, distribution, interaction, LiDAR, volcanic, craft, monumental, organization, salt, blade, residential, urban, consumption, labor.

2) Diachronic change of the frequency list

1986-2000: Top 150 frequency list show early research trends and topics in the history of Japanese scholars in Mesoamerica (Table 2). Representative words indicating research areas and sites are; Aguateca, Petexbatun, Teotihuacan, Copan, La Entrada,

Table 1. Top 150 Frequency list of total publications.

All Frequency List Top 150					
Words	**TF**	**Words**	**TF**	**Words**	**TF**
Maya	113	shell	24	place	15
Ceibal	75	Chalchuapa	23	space	15
obsidian	71	classic	23	spatial	15
structure	67	community	23	temple	15
production	64	practice	23	Terminal_Classic	15
artifact	54	ruler	23	civilization	14
center	54	Late_Preclassic	22	eruption	14
political	54	role	22	event	14
complex	53	society	22	occupation	14
material	52	state	22	Peten	14
construction	50	Mesoamerica	21	platform	14
elite	48	Mexico	21	point	14
Aguateca	47	modern	21	pyramid	14
Guatemala	44	power	21	Southern	14
Classic_Maya	43	radiocarbon	21	type	14
social	42	warfare	21	World	14
animal	41	assemblage	20	Coast	13
Copan	40	bone	20	Early_Classic	13
group	39	ceremonial	20	multiple	13
burial	38	cultural	20	order	13
ceramic	38	food	20	pottery	13
human	38	late	20	regional	13
ritual	38	Late_Classic	20	soil	13
Teotihuacan	37	life	20	value	13
exchange	34	local	20	difference	12
Middle_Preclassic	33	royal	20	economic	12
population	33	distribution	19	history	12
developmen	32	interaction	19	inhabitant	12
process	32	source	19	isotope	12
change	31	form	18	Kaminaljuyu	12
El_Salvador	31	Honduras	18	lime	12
lithic	31	LiDAR	18	monument	12
pattern	31	lowland	18	past	12
architectural	30	technique	18	plaza	12
chronology	29	volcanic	18	raw	12
early	29	craft	17	relation	12
individual	29	monumental	17	settlement	12
Preclassic	29	offering	17	survey	12
time	29	organization	17	transition	12
central	27	relationship	17	Valley	12
Maya_Lowlands	27	salt	17	artistic	11
phase	27	blade	16	landscape	11
building	26	North	16	mesoamerican	11
date	26	prehispanic	16	Olmec	11
object	26	residential	16	physical	11
stone	26	sequence	16	residence	11
context	25	urban	16	resident	11
core	25	consumption	15	San_Andres	11
city	24	dynasty	15	Tazumal	11
public	24	labor	15	tool	11

Table 2. Top 150 Frequency list of 1986-2000 publications

Words	TF	Words	TF	Words	TF
obsidian	14	wall	3	partner	2
center	13	warfare	3	pendant	2
structure	9	western	3	percussion	2
Late_Classic	8	A.C.	2	population	2
artifact	7	artistic	2	process	2
material	7	beginning	2	rapid	2
political	7	blade	2	ritual	2
production	7	building	2	role	2
source	7	central	2	sacrifice	2
time	7	chalcedony	2	scribal	2
Aguateca	6	cobble	2	sequence	2
complex	6	consumption	2	Serpent	2
distribution	6	cost	2	settlement	2
shell	6	creation	2	single	2
assemblage	5	Early_Classic	2	socioeconomic	2
Classic_Maya	5	economic	2	spatial	2
Petexbatun	5	effort	2	stone	2
pyramid	5	eighth	2	survey	2
regional	5	elite	2	test	2
San_Luis	5	enemy	2	transaction	2
Teotihuacan	5	epigraphic	2	underworld	2
control	4	expenditure	2	use-intensity	2
Copan	4	family	2	value	2
defensive	4	Feathered	2	Vanderbilt	2
exchange	4	Feathered_Serpent_Pyramid	2	visual	2
iconographic	4	figurine	2	10L-16	1
Ixtepeque	4	flake	2	10L-22A	1
La_Entrada	4	form	2	260-day	1
Quetzalcoatl	4	framework	2	abandones	1
technique	4	goods	2	abandonment	1
Temple	4	group	2	accordance	1
assay	3	Guatemala	2	accurate	1
burial	3	hondura	2	activation	1
central-place	3	house	2	America	1
compositional	3	human	2	analytical	1
early	3	jaw	2	artifactual	1
geological	3	late	2	attack	1
Honduras	3	Late_Preclassic	2	attention	1
household	3	local	2	authority	1
individual	3	low	2	axis	1
interaction	3	male	2	B.C.-A.C.	1
lithic	3	Marine	2	banquet	1
Maya	3	Maya_Lowlands	2	basic	1
monument	3	Mesoamerica	2	bead	1
ninth	3	mesoamerican	2	belief	1
object	3	microwear	2	bipolar	1
offering	3	Middle_Preclassic	2	body	1
pattern	3	military	2	bone	1
society	3	myth	2	boundary	1
use-wear	3	palisade	2	bundle	1

and Maya. Late Classic and Classic Maya are the most focused periods in 1986-2000 publications. Regarding the research topics, following words are in the top 50; obsidian, center, political, production, distribution, pyramid, defensive, exchange, interaction, warfare.

2001-2005 Top 150 frequency list slightly change from previous years (Table 3). Particularly, the research area and periods focus more on Classic Maya such as Aguateca and Copan. Research topics are clearer than previous years. Words such as elite, residence, craft, state, exchange, production, and royal are representative words. Interestingly, soil, chemical, and food are, also, frequent words in this period, indicating different trends comparing with other periods.

2006-2010 Top 150 frequency list continues same tendency of previous periods, which focus on Classic Maya, obsidian, and elite (Table 4). However, the specific words such as bone, city, ritual, royal, shell and Ceibal presented more apparently. The trends of frequent words regarding research areas changed. El Salvador, Chalchuapa, and Tazumal are listed in the Top 50. It may be related to this tendency, the word TBJ, which is Tierra Blanca Joven eruption, largest volcanic eruption in Americas, appeared from this period.

2011-2015 frequency list indicates that researches on Maya continue central themes for Japanese scholars (Table 5). Main research sites are Copan and Ceibal. Furthr, Teotihuacan rises again in the Top 50 words. Itza appeared for the first time. In addition to the words El Salvador and Chalchuapa, Kaminaljuyu, which is one of the important centers of southern Maya region, comes to in the list. The representative words regarding research topics in the top 50 includes; production, structure, burial, population, ceramic, change, animal, construction, lime, chronology, pottery, volcanic, and dental.

2016-2020 frequency list demonstrates that although the main research field continues Maya and Teotihuacan, the main periods studied by Japanese scholars changed Classic into earlier period such as Middle Preclassic, Preclassic and Late Preclassic (Table 6). Some representative words related to research topics are; material, obsidian, animal, construction, production, artifact, ritual, community, LiDAR, labor, and elite. Additionally, it is remarkable that the words related to the chronology increased from previous periods such as date, ceramic and radiocarbon.

2021-2022 frequency list demonstrates most recent trends and topics interested by Japanese scholars (Table 7), even though there are still small samples. Regarding research areas or sites, El Salvador, Maya, Ceibal, San Andres, Teotihucan, San Lorenzo, and Olmec are frequent words in the Top 100 words. In terms of the periods, Middle Preclassic, Early Classic, Late Postclassic are in the Top 100. Words human, material, and modern are top 3 words in the 2021-2022, which is totally different trends in other periods. Subsequently, construction, landscape, radiocarbon, warfare, eruption, action, agent, animal, anthropogenic are also frequent words within Top 100 words.

3) Co-occurrence Network analysis

Co-occurrence Network analysis demonstrates a graphic visualization of potential relationships among words in the texts. While the frequency list extract only single words in order of frequency, this network analysis is more relational (Figure 2). This analysis could make it possible to visually understand what is being researched in which area, at what time period, and what is being investigated. KH coder automatically divided groups (subgraph in the Figure 2) based on connectivity among words and show them by color. Color density in the subgraph indicate the centrality of the word in the group. Straight line means strong connection among words. On the other hand, dashed line means loosely connected words. Size of circle indicate the frequency of the word.

The red, purple, yellow and emerald green groups are main group and connected with each other different key words. The red group indicate that the most frequent word “Maya” strongly connects with Ceibal and other words related to place or spatial analysis. Representative words in the yellow group are: Classic Maya and Aguateca and those connect with words related to political economy, socioeconomic, and ritual. Those groups connected with purple and emerald green group through words artifact, elite, production and obsidian. The purple group consists of words related to obsidian studies (exchange, source, blade, core), periods (Middle_Preclassic, Late_Preclassic, Terminal Classic). The emerald green group is spread a little wider and more diverse. Production connects with shell and bone. Interestingly, there is Teotihuacan in the emerald green group, connecting with words state, labor, and urban.

The results show other small relational groups. The orange group consists of words related to dating such as date, radiocarbon, ceramic and which connected with Chalchuapa. The blue group consist of words related to Copan and this group is connecting with the yellow group through word dynasty and political. The green and grey groups are words about architecture and construction. The pink group consists of more general words such as development, role and Mesoamerica.

Table 3. Top 150 Frequency list of 2001-2005 publications

Words	TF	Words	TF	Words	TF
elite	13	ethnoarchaeologica	2	chemistry	1
Aguateca	10	floor	2	city	1
soil	10	group	2	classic-period	1
Classic_Maya	9	Honduras	2	commodity	1
Copan	8	ideology	2	competition	1
center	7	local	2	complex	1
residence	7	low	2	conflict	1
building	6	magnesium	2	consequence	1
chemical	6	meaning	2	construction	1
Guatemala	6	modern	2	correlation	1
Maya	6	obsidian	2	court	1
craft	5	pattern	2	culture	1
development	5	ph	2	daily	1
state	5	phosphorous	2	decline	1
concentration	4	point	2	distribution	1
exchange	4	potassium	2	division	1
food	4	power	2	downfall	1
phosphorus	4	preparation	2	DTPA	1
process	4	relationship	2	Early_Classic	1
production	4	scribes/artists	2	earth	1
royal	4	signature	2	emphasis	1
ruler	4	social	2	end	1
space	4	spear	2	exchangeable	1
structure	4	specialization	2	female	1
artistic	3	Valley	2	filing	1
consumption	3	warfare	2	flashlight	1
disposal	3	A.C.	1	gathering	1
enemy	3	abandonment	1	geology	1
family	3	Acropolis	1	guard	1
human	3	act	1	guidance	1
ion	3	active	1	hilltop	1
object	3	alkalinity	1	hinterland	1
political	3	ammonium	1	household	1
role	3	application	1	identifiable	1
society	3	architectural	1	imprint	1
symbolic	3	arena	1	incursion	1
blade	2	arrow	1	inhabitant	1
calcium	2	art	1	innovation	1
civilization	2	artifact	1	insoluble	1
Classic	2	artifactual	1	integrated	1
clear	2	artist	1	intergroup	1
context	2	assemblage	1	intraregional	1
core	2	battery	1	iron	1
creation	2	beginning	1	Ixtepeque	1
crucial	2	body	1	kinship	1
cultural	2	calcareous	1	knowledge	1
dart	2	capital	1	Las_Pozas	1
display	2	carbonate	1	late	1
domestic	2	centralized	1	Late_Classic	1
economic	2	Cerro	1	layout	1

Table 4. Top 150 Frequency list of 2006-2010 publications

Words	TF	Words	TF	Words	TF
Aguateca	27	monumental	5	JOCV	3
obsidian	22	plaza	5	key	3
political	21	Preclassic	5	life	3
structure	21	prismatic	5	Los_Naranjos	3
artifact	17	temple	5	macroscopic	3
lithic	17	theatrical	5	man	3
Maya	16	time	5	Maya_Lowlands	3
elite	15	artistic	4	Mesoamerica	3
burial	14	bell-shaped	4	mesoamerican	3
El_Salvador	14	bird	4	midden	3
phase	14	Casa_Blanca	4	Nagoya	3
architectural	13	center	4	National	3
ceramic	12	central	4	Native	3
Classic_Maya	12	Classic	4	past	3
construction	12	coastal	4	Petexbatun	3
bone	11	Copan	4	population	3
Chalchuapa	11	core	4	primary	3
production	11	exchange	4	product	3
city	10	household	4	San_Bartolo	3
prehispanic	10	ideology	4	settlement	3
complex	9	Late_Classic	4	space	3
development	9	Late_Preclassic	4	tool	3
offering	9	monument	4	University	3
ritual	9	north	4	urban	3
royal	9	occupation	4	urbanization	3
cultural	8	pattern	4	vase	3
power	8	performance	4	western	3
ruler	8	physical	4	woman	3
shell	8	place	4	1940	2
stone	8	Restoration	4	access	2
distribution	7	society	4	adobe	2
Group	7	state	4	adult	2
Tazumal	7	technique	4	ambiguity	2
TBJ	7	Terminal_Classic	4	Americans	2
building	6	vessel	4	b1	2
Ceibal	6	animal	3	B1-1	2
change	6	art	3	ballcourt	2
context	6	community	3	beginning	2
dynasty	6	court	3	bowl	2
Guatemala	6	December	3	C14	2
organization	6	earth	3	capital	2
process	6	eccentric	3	Ceibal-Petexbatun	2
socioeconomic	6	economy	3	chert	2
blade	5	El_Chayal	3	Chiquirin	2
CONCULTURA	5	evaluation	3	clay	2
craft	5	human	3	complexity	2
crevice	5	imagery	3	condition	2
individual	5	inhabitant	3	consequence	2
local	5	in_situ	3	crack	2
material	5	JICA	3	creation	2

Table 5. Top 150 Frequency list of 2011-2015 publications

Words	TF	Words	TF	Words	TF
Maya	37	Kaminaljuyu	6	funerary	4
production	20	Late_Preclassic	6	haplogroup	4
structure	16	life	6	history	4
group	15	lithic	6	Honduras	4
burial	13	obsidian	6	Ilopango	4
population	13	physical	6	interaction	4
ceramic	12	Preclassic	6	landscape	4
change	12	relationship	6	Mazahua	4
human	12	ruler	6	meaning	4
social	12	sequence	6	multiple	4
animal	11	Sun_Pyramid	6	non-local	4
artifact	11	time	6	occupation	4
construction	11	world	6	offering	4
Peten	11	bone	5	order	4
practice	11	classic	5	point	4
architectural	10	common	5	pyramid	4
complex	10	domestic	5	role	4
Copan	10	eruption	5	sculpture	4
Guatemala	10	head	5	shell	4
lime	10	isotope	5	society	4
ritual	10	lowland	5	Southeastern	4
Maya_Lowlands	9	material	5	Spaniards	4
public	9	Middle_Preclassic	5	symbolic	4
type	9	organization	5	Tayasal	4
Acropolis	8	past	5	Tazumal	4
Ceibal	8	perspective	5	temple	4
central	8	phase	5	Terminal_Classic	4
chronology	8	place	5	transition	4
individual	8	plaster	5	acquisition	3
North	8	pre-hispanic	5	Bajo_Lempa	3
object	8	process	5	cache	3
pattern	8	residential	5	calcination	3
political	8	salt	5	cathodoluminescen	3
Southern	8	South	5	chert	3
stone	8	theory	5	City	3
Teotihuacan	8	warfare	5	clay	3
volcanic	8	weapon	5	coastal	3
Itza	7	anthropology	4	component	3
Mesoamerica	7	ash	4	condition	3
pottery	7	Belize	4	conquest	3
America	6	capital	4	conservation	3
carnivore	6	Chalchuapa	4	contact	3
center	6	community	4	core	3
ceremonial	6	context	4	development	3
Classic_Maya	6	date	4	diachronic	3
coast	6	disease	4	diagnostic	3
cultural	6	duration	4	diverse	3
dental	6	elite	4	Early_Classic	3
early	6	evaluation	4	El_Trapiche	3
El_Salvador	6	exchange	4	exploration	3

Table 6. Top 150 Frequency list of 2016-2020 publications

Words	TF	Words	TF	Words	TF
Ceibal	57	Maya_Lowlands	10	faunal	6
Maya	46	practice	10	fish	6
material	27	time	10	initial	6
obsidian	27	difference	9	interregional	6
animal	25	dynasty	9	isotope	6
complex	25	individual	9	Kaminaljuyu	6
Middle_Preclassic	20	interaction	9	Late_Classic	6
center	19	leporid	9	Mesoamerica	6
construction	19	modern	9	multiple	6
social	19	object	9	place	6
chronology	18	raw	9	plaza	6
Guatemala	18	resident	9	polyhedral	6
Teotihuacan	18	residential	9	procurement	6
Preclassic	17	source	9	sequence	6
production	17	urban	9	surface	6
artifact	16	burial	8	Terminal_Classic	6
ritual	16	Chalchuapa	8	transition	6
community	15	city	8	Adobe_brick	5
date	15	consumption	8	architectural	5
Mexico	15	E-Group	8	bayesian	5
population	15	local	8	bioapatite	5
ceramic	14	Oztoyahualco	8	block	5
Copan	14	phase	8	celt	5
development	13	platform	8	Chiapas	5
exchange	13	point	8	Coast	5
LiDAR	13	power	8	diachronic	5
pattern	13	secondary	8	diet	5
context	12	spatial	8	diverse	5
core	12	state	8	earliest	5
early	12	value	8	Early_Classic	5
form	12	building	7	El_Salvador	5
labor	12	highland	7	felid	5
political	12	Honduras	7	greenstone	5
process	12	inhabitant	7	history	5
public	12	management	7	life	5
central	11	order	7	long-distance	5
change	11	plateau	7	map	5
classic	11	relation	7	monumental	5
Classic_Maya	11	relationship	7	occupation	5
elite	11	role	7	Olmec	5
late	11	salt	7	principal	5
radiocarbon	11	stone	7	reference	5
structure	11	blade	6	San_Andres	5
assemblage	10	cache	6	society	5
ceremonial	10	centre	6	Southern	5
food	10	civilization	6	spectroscopy	5
group	10	collapse	6	tabular	5
human	10	compound	6	technique	5
Late_Preclassic	10	El_Chayal	6	vegetation	5
lowland	10	event	6	World	5

Table 7. Top 150 Frequency list of 2021-2022 publications

Words	TF	Words	TF	Words	TF
human	8	organism	3	plant	2
material	8	political	3	pot	2
modern	8	process	3	pre-hispanic	2
construction	6	San_Lorenzo	3	primary	2
early	6	shell	3	public	2
El_Salvador	6	society	3	raw	2
landscape	6	terrestrial	3	rectangular	2
radiocarbon	6	urban	3	regional	2
social	6	workshop	3	response	2
structure	6	world	3	rock	2
warfare	6	action	2	settlement	2
center	5	agent	2	southeastern	2
date	5	animal	2	spatial	2
eruption	5	anthropogenic	2	technique	2
exchange	5	artifact	2	Terminal_Preclassi	2
lidar	5	bayesian	2	tissue	2
life	5	body	2	transformation	2
Maya	5	Campana	2	variation	2
Middle_Preclassic	5	carbonate	2	abandonment	1
monumental	5	Central	2	abrupt	1
production	5	change	2	adaptation	1
role	5	chronology	2	alarming	1
salt	5	complex	2	alignment	1
volcanic	5	correction	2	application	1
building	4	database	2	archaic	1
carbon	4	development	2	architectural	1
Ceibal	4	dynamic	2	array	1
core	4	Early_Classic	2	artificial	1
event	4	economic	2	assemblage	1
individual	4	economy	2	Assessment	1
later	4	emergence	2	bedrock	1
pottery	4	fish	2	bone	1
San_Andres	4	formal	2	bone/shell	1
survey	4	geomorphic	2	brine	1
Teotihuacan	4	ground	2	broad	1
Valley	4	Guatemala	2	capital	1
aquatic	3	heritage	2	catastrophic	1
ceremonial	3	historic	2	categorical	1
civilization	3	identification	2	centre	1
effect	3	identity	2	ceramic-using	1
elite	3	inorganic	2	chronological	1
group	3	interaction	2	City	1
lithic	3	lake	2	classic	1
map	3	late	2	coast	1
market	3	Late_Postclassic	2	Colonial	1
Maya_Lowlands	3	local	2	commonality	1
Mesoamerica	3	Mexico	2	communal	1
mesoamerican	3	Olmec	2	community	1
model	3	past	2	contemporaneous	1
mollusk	3	people	2	continuity	1

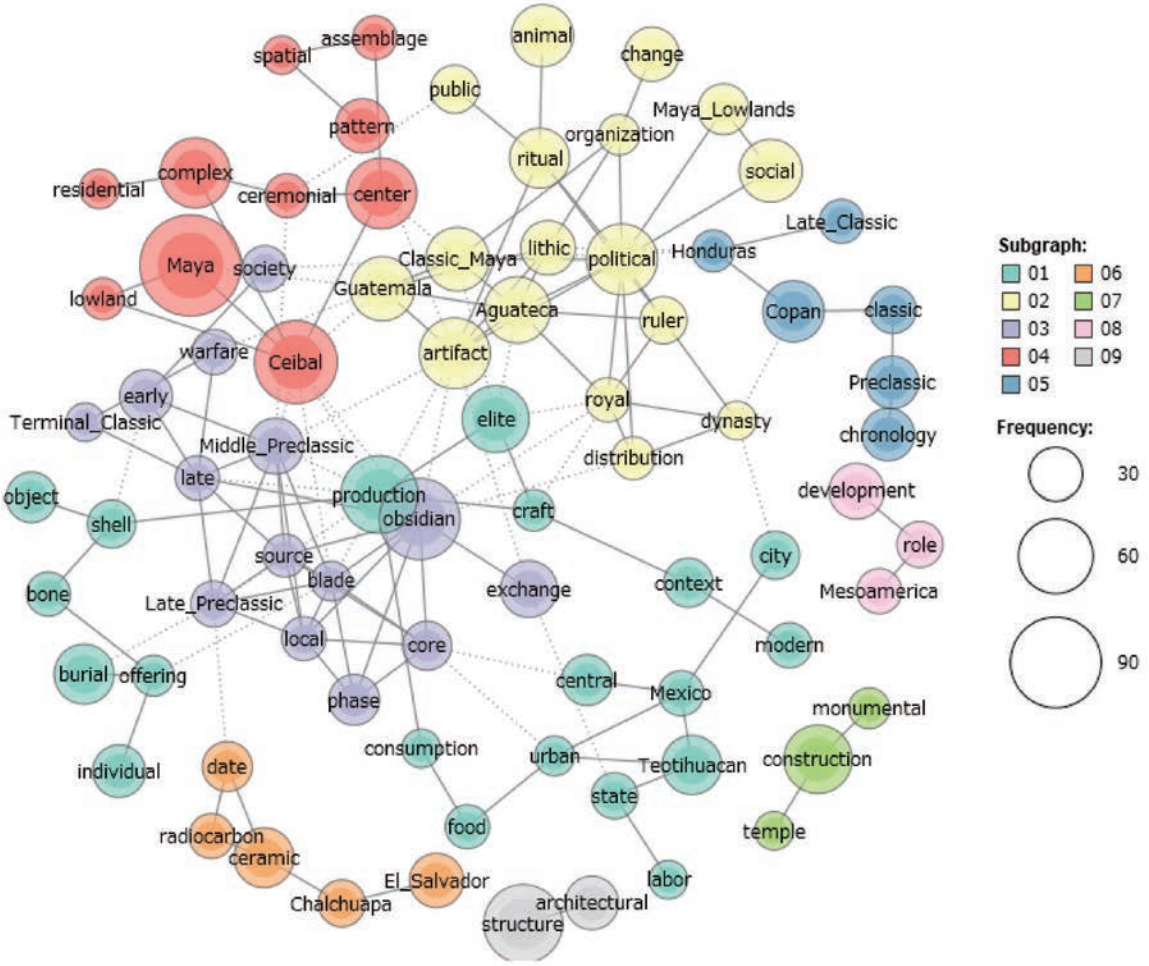

Figure 2. Results of Co-occurrence network analysis (generated by authors using KH coder)

Discussions

As described in introduction, this paper aims to examine what kind of research have been focused on by Japanese scholars, how they were recognized and contributed to in the academia, using text mining analysis of 161 published paper by Japanese scholars. This section discusses the data created by KH coder with the historical background of Japanese scholars described in the previous section to respond research questions mentioned above.

As a whole, the Frequency list and Co-occurrence network analysis both clearly indicate that research on Maya, especially Classic Maya and Maya Lowlands, is a main interest for Japanese scholars all the time. This is not surprisingly but the diachronic change of the Frequency list provides us useful data to understand more specifically what kinds of research have been focused on by Japanese scholars through the time.

Research areas

The data indicate that Japanese scholars have carried out in the vast areas and sites of Mesoamerica. As described in the historical background, Japanese scholars joined or organized archaeological project in Mesoamerica since 1970-80s, which means that Japanese scholars become field-based Mesoamerican archaeologists. Japanese scholars conduct researches and published data and argument about different topics through own original data come from their excavation. La Entrada Archaeological Project organized by JICA archaeologists was remarkable, even though less frequent in the Frequency list. Because researches on Aguateca and Copan, which are most frequent words for next several years, were carried out by archaeologists from the La Entrada Archaeological project such as Takeshi Inomata, Kazuo Aoyama and Seiichi Nakamura.

The Frequency list tell us that Teotihuacan is also one of main targets by Japanese scholars since the beginning of field-based research started in Mesoamerica. Saburo Sugiyama is the pioneer and main scholar at Teotihuacan. Since then, Sugiyama and his colleagues has investigated the main architectural complex at Teotihuacan such as Feathered Serpent pyramid, Sun and

Moon pyramids and the Plaza de las Columnas.

In the 2006-2010 Frequency list "El Salvador" and "Chalchuapa" appear in the top 20 frequent words. New archaeological project at El Salvador is behind this. Kuniaki Ohi, Nobuyuki Ito and Shione Shibata initiated archaeological investigation at Chalchuapa, which is one of the important sites in the southeastern Mesoamerica [Sharer ed. 1978]. Additionally, like a La Entrada Archaeological Project, JICA programs that starts from 2003 also contributed to this tendency.

According to the Frequency list, Maya (Augateca, Ceibal and Copan), Teotihuacan and El Salvador (Chalchuapa) are main research fields for Japanese scholars in the last two decades. This suggests that Japanese scholars have focused on investigating specific sites for long-term to reveal several topics and verify hypothesis. Further, this may indicate that Japanese scholars tend to want enough primary data to argue or prove something.

Based on the historical background of Japanese scholars in Mesoamerican archaeology, however, in the last decade young generation scholars including Reiko Ishihara, Shigeru Kabata, Hirokazu Kotegawa, Mitsuru Kurosaki, Tatsuya Murakami, Yuko Shiratori, Shintaro Suzuki, and Kenichiro Tsukamoto have been working in different areas and sites of Mesoamerica. The outcomes from those researches include in this study but they will reflect more on next decade(s). Interestingly, those scholars studied Mesoamerica archaeology and got Ph.D. in Mexico or US. They have vast knowledge about Mesoamerica and academic network in those countries. This background may contribute to diversification of research field of Japanese scholars.

Furthermore, as for the possibility that the diversity of the research area is not reflected, it is highly possible that it was not reflected in this analysis because the researches have not been published in English.

Research periods

The data indicate that main targeted period is Classic. Major hundreds of monumental architectures and carved stones monuments in Mesoamerica were from the Classic period [Evans 2013]. Therefore, since the early history of Mesoamerican archaeology Classic period is most researched period in Mesoamerican archaeology. This tendency also reflects to the research conducted by Japanese scholars.

The Classic period is main interests by now, but last two decades Preclassic period is also targeted by Japanese scholars [e.g. Inomata et al. 2013, 2021]. This trend is consistent with recent trends in Mesoamerican archaeology [e.g. Nichols ed. 2012]. Recent Mesoamerican archaeology seeks to understand the origin and emergence of several components of Mesoamerican civilization such as sedentary life, maize agriculture, emergence of social complexity and inequality, origin of city and state, cosmovision, religion, and long-distance trade network so far. The 2021-2022 Frequency list marked this shift, which is indicated by Middle Preclassic, Olmec and San Lorenzo.

The Postclassic period has been paid less attention by Japanese scholars. Only a few papers related to this period exists by now. For long time the Postclassic period had been labeled as less developed period but not necessary relationship to a stage of development. Recently, the Postclassic period is recognized as transformation or reorganization period after the Classic collapse in Mesoamerica [Chase and Chase 2004] and also as contact period with Spanish conquistador.

Research topics

Diachronic change of research trends provides interesting insight on the history and contributions of Japanese scholars in Mesoamerican archaeology. Although the research topics are literally diverse, words related to production (craft, artifact, material, and obsidian) and related to political power (elite, ruler, royal) are most frequent words used from the late 1980s to the present. Subsequently, words like warfare and exchange are also frequent and related to obsidian studies and political power. These words mostly cooccurred with "Maya" in the co-occurrence network. This data indicates that over several years, Japanese scholars developed researches on craft production studies through lithic analysis and studies on political power relations in the Maya civilization.

Words like construction, structure, and center are frequent words in all periods. Additionally, even though less frequent, words like place, space, spatial, platform, pyramid, temple, and plaza are meaningful. This indicates that scholars concentrated on structures or more broadly place or space. It is not surprising because generally speaking, structures are the main residential space or political arena, which provide rich information about ancient societies. Although there is no clear correlation in the co-occurrence network, those words likely correlated to words like "urban," "state," and "city," which are relevant topics in archaeology generally [e.g. Love and Guernsey 2022]. Although it is not so frequent on the list, studies on "plaza" by Japanese scholars opened new study directions related to space. Plaza relates to space surrounded by structures and also important gathering spaces and political arenas for ancient people [Tsukamoto and Inomata eds. 2014]. Words like lime, plaster, and labor, increased in the 2011-2015 period and relate to construction and

power relationships [Murakami 2010].

Words like ritual, ceremonial, and community increased in frequency from 2006-2010 up to the most recent period. Interestingly, according to the co-occurrence networks analysis, the word "ritual" has strong ties with words like political, public, and animal. This correlation is consistent with the fact that ritual or more broadly religion is one of the central themes in Mesoamerican archaeology and is deeply embedded in Mesoamerican societies [e.g. Joyce and Barber eds. 2017]. Additionally, the word "animal" is remarkable. In Mesoamerica "animal" is important as a diet resource and potentially sacred and deeply embedded in the Mesoamerican worldview. For this reason, the word "animal" connects to "ritual." In line with recent social science or humanities trends, scholars have tried to rethink the traditional view of human-animal relationships [e.g. Boyd 2017]. Japanese archaeologists could contribute to this area.

The data indicate that chorology-building is one of the important contributions of Japanese scholars in Mesoamerican archaeology, especially after the period 2011-2015. High precision chronology is key to understanding social processes and their correlation with different events including environmental change. This trend was triggered by research about early ceremonial constructions at Ceibal, which analyze large radiocarbon dating and ceramic data sets with Bayesian modeling [Inomata et al. 2013]. Recent investigations about Kaminaljuyu [Inomata et al. 2014], El Palmar [Tsukamoto et al. 2020], Tlalancaleca [Murakami 2022], and San Andres [Ichikawa 2022] follow this trend.

The word "burial" is also highly ranked in the Frequency list. Based on the co-occurrence network analysis, burial connects to the word "offering." This comes from a massive sacrificial burial at Teotihuacan [Sugiyama 1983, 2005]. Although there is no clear co-occurrence in this analysis, the word "burial" should be correlated with the word "isotopic." Isotopic studies, especially for human and animal bones, led to new trends in Mesoamerican archaeology by combining them with bioarchaeology [Tiesler ed. 2022]. Isotopic studies carried out at Copan by Japanese scholars contribute to understanding the nature of immigration, mobility, and multi-ethnicity in the Classic period [Price et al. 2014; Suzuki et al. 2020]. The latest research on non-royal elite burial at El Palmar, combining osteological, archaeological, and epigraphic data, also, is an important contribution to the Classic Maya society [Cerezo-Román and Tsukamoto 2021].

Increasing the frequency of words like volcanic, eruption, and TBJ after the 2006-2010 period is significant. TBJ refers to the Tierra Blanca Joven eruption, which was the largest volcanic eruption in the Americas during the Holocene [Dull et al. 2019]. Research on the TBJ eruption offers important insight into sudden environmental change and human adaptation. However, the eruption date and impact of the TBJ eruption are still under discussion. The argument for short-term recovery from the TBJ eruption based on the San Andres excavations contributes to this issue [Ichikawa 2022]. Although it remains unclear, it has been pointed out that the volcanic eruption of Popocatepetl was one factor causing a substantial settlement shift in Central Mexico and then the rise of Teotihuacan [Plunket and Uruñuela 2006]. Researches on Tlalancaleca in Puebla, a large Preclassic site in Central Mexico [e.g. Murakami et al. 2017], produced new understandings of relationships between early urbanization processes, the rise of Teotihuacan, and volcanic eruption in Central Mexico.

LiDAR, landscape, and map were frequent words in the last few years. LiDAR is a new innovative technology to understand settlement patterns and landscapes. LiDAR hugely impacted Mesoamerican archaeology, particularly the Maya Lowlands, which are broadly covered by jungle and could change our understanding and/or model established in the previous literature [e.g. Canuto et al. 2019; Inomata et al. 2018].

Interestingly, after 2015, and more apparently in 2021-2022, the term "modern" has a high frequency in the Frequency list. This may indicate that Japanese scholars are conscious of connecting studies about the past to the modern world. Words like "anthropogenic" definitely correlate with recent scientific trends in the Anthropocene era [e.g. Kennett and Beach 2013]. Thus, archaeology studies the past and challenges us to resolve several modern problems. This trend is consistent with "Grand Challenges for Archaeology" [Kintigh et al. 2014].

Concluding remarks

This study qualitatively and quantitively demonstrates the history of Japanese scholars in Mesoamerican archaeology. Recently, important articles written by Japanese scholars were published in major peer-reviewed journals including Nature, Science, Proceedings of the National Academy of Sciences, and other high-impact journals in archaeology and anthropology. We believe Japanese scholars are becoming some of the main actors in Mesoamerican archaeology over the last decade. Despite this, no university in Japan has a program dedicated to studying Mesoamerican archaeology, or even New World archaeology. Nevertheless, there are more opportunities than in previous decades to learn Mesoamerican archaeology in Japan. However, many of them are a single-subject class. Our new generations should

make an effort to establish professional and educational organizations/programs to study Mesoamerican archaeology systematically in the future.

As we discussed before, Japanese scholars have contributed specifically to Maya archeology. For this, the La Entrada Archaeological Project was a turning point. Since then, importantly Professor Nakamura and other Japanese pioneers have devoted time to the field over the long term and conducted archaeological research while also establishing good relationships with local communities. Although this is out of scope in this paper, conservation programs for Maya cultural heritage carried out by Japanese pioneers are also an important contribution to Maya archaeology and the communities near archaeological sites. Younger generations, like us, should inherit this tradition.

Acknowledgments

We are truly grateful to Professor Seiichi Nakamura for his passion for Maya archaeology. Professor Nakamura has undoubtedly opened up a new door for younger Japanese generations, which have an enthusiasm for studying Maya archaeology. We would not exist without him. This paper was financially supported by a grant from the Japan Society for the Promotion of Science KAKENHI (19H05734). Finally, we thank Dr. Takuro Adachi and the editorial team of the Institute for the Study of Ancient Civilizations and Cultural Resources at Kanazawa University for inviting us to participate in this important and historical volume of Maya archaeology in Japan. All errors are the responsibility of the authors.

Notes

1. The number of publications has been updated since Ichikawa 2014, which counted 777 publications by Japanese scholars [Ichikawa 2014]. Although the exact number of publications might be needed, it is a large enough number to follow the trends and history of Japanese scholars in Mesoamerican archaeology.
2. Light Detection and Ranging, an airborne remote sensing method. This innovative method can precisely generate three-dimensional topographic features on the surface even when dense vegetation covers a research area.
3. http://www.asociaciontikal.com

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Japanese Contributions to the Studies of Mesoamerican Civilizations
: the 40th Anniversary of La Entrada Archaeological Project
Studies in Ancient Civilizations vol.1

First published on March 15th, 2023
Editors: Seiichi Nakamura, Takuro Adachi, and Masahiro Ogawa
Publisher: Institute for the Study of Ancient Civilizations and Cultural Resources, Kanazawa University, Japan
Kakuma-machi Kanazawa, Ishikawa, 920-1192, Japan
TEL 076-264-5785
https://isac.w3.kanazawa-u.ac.jp
E-mail kanazawa.isac@gmail.com
Printed by MAEDA PRINTING CO., LTD

ISBN 978-4-944014-37-8.