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Review of Michał Gilewski's PhD entitled "Relationships between pre-Columbian and modern Maya agriculture in the Southern Maya area" - Supervisor: Prof. Nikolai Grube (University of Bonn)

The dissertation written by Michał Gilewski touches one of the most interesting but understudied topics of Maya and Mesoamerican archaeology concerning pre-Hispanic Maya agriculture and its ties with modern indigenous practices. His dissertation consists of 10 chapters, bibliography and several annexes.

The first, introductory chapter presents the major goals and objectives of the dissertation. We learn here that Mr. Gilewski attempts to study modern and pre-Hispanic agricultural techniques in the Maya area. His aim is to see what has changed across time and what elements of pre-Columbian agriculture stayed the same. He focuses on the so-called Southern Maya area which is a region still densely occupied by indigenous populations of the Maya language family. His dissertation attempts to fill in a scientific gap in the discussed subject since archaeological research that have been conducted so far has yielded extremely scant information on the subject of agriculture in the Southern Maya area. His dissertation is not only based on a review of

existing literature on this subject but it also incorporates the results of his own research conducted within the framework of the National Archaeological Park of Tak'alik Ab'aj.

In Chapter 2 Mr. Gilewski presents an outline of the methodology applied in his research. Not only did he rely on archaeological data but he also incorporated ethnohistoric and ethnographic data. In general this is a fairly well prepared section. However, there are several omissions which should have been included. When he discusses archaeological fieldworks he mentions that field-surveying, mapping and remote sensing are major methods that enable scholars to register agricultural-related features (especially agricultural terraces). However, there is no mention of LiDAR technology, which has recently enabled scholars working in different parts of Maya area to record various agricultural features including terraces on slopes (although these LiDAR research were concentrated on the Maya lowlands, e.g. Canuto *et al.* 2018; Chase *et al.* 2011; Golden *et al.* 2016; Ringle *et al.* 2021¹). Moreover, sections entitled “Archaeological fieldwork” and “Excavations” are very short and they only briefly touch on the discussed problems. In a section entitled “The emergence of Maya Archaeology” (pages 48-49) he talks about early studies and perception of the pre-Hispanic Maya by the first generation of scholars. Surprisingly, we do not find here references to scholars who created the very famous view of Maya civilisation as being ruled by philosophers and astronomers (Eric Thompson or Sylvanus Morley whose theories dominated scholarly discourse for many decades). Apart from such drawbacks, Chapter 2 is a rather good overview of how theories on Maya agriculture and the role of maize in the Maya diet evolved across time during last 100 years of scientific research, from early archaeological investigations, through processual and finishing with post-processual approaches in archaeology.

Chapter 3 constitutes an outline of the archaeology of agriculture in the Southern Maya area. Mr. Gilewski reviews the literature in terms of the presence of archaeological and

¹ Chase A.F., Chase D.Z., Weishampel J.F., Drake J.B., Shrestha R.L., Slatton K.C., Awe J.J., Carter W.E. 2011. Airborne LIDAR, archaeology, and the ancient Maya landscape at Caracol, Belize. *Journal of Archaeological Science*, 38 (2011): 387-398.

Charles Golden, Timothy Murtha, Bruce Cook, Derek S. Shaffer, Whittaker Schroder, Elijah J. Hermitt, Omar Alcover Firpi, Andrew K. Scherer. 2016. Reanalyzing environmental lidar data for archaeology: Mesoamerican applications and implications. *Journal of Archaeological Science: Reports*, 9 (2016): 293-308.

Ringle W.M., Gallareta Negrón T., May Ciau R., Seligson K.E., Fernandez-Diaz J.C., Ortegón Zapata D. 2021. Lidar survey of ancient Maya settlement in the Puuc region of Yucatan, Mexico. *PLoS ONE* 16(4): e0249314. <https://doi.org/10.1371/journal.pone.0249314>.

Marcello A. Canuto, Francisco Estrada-Belli, Thomas G. Garrison, Stephen D. Houston, Mary Jane Acuña, Milan Kováč, Damien Marken, Philippe Nondédéo, Luke Auld-Thomas, Cyril Castanet, David Chatelain, Carlos R. Chiriboga, Tomáš Drápela, Tibor Lieskovský, Alexandre Tokovinine, Antolín Velasquez, Juan C. Fernández-Díaz, Ramesh Shrestha. 2018. Ancient lowland Maya complexity as revealed by airborne laser scanning of northern Guatemala. *Science* 361 (6409):eaau0137.

paleobotanical traces related to agriculture and crops. This chapter presents a relatively good review of the literature on agricultural terraces and irrigation, as well as paleobotanical traces related to plant cultivation in the Southern Maya area. It is worth emphasising that in some parts of this region the PhD student himself made reconnaissance in order to find agricultural features related to agriculture. His studies on this subject indicate that, with some exceptions, previous archaeological research provided very limited evidence of agricultural features in the discussed region.

Chapter 4 describes agricultural practices in the Southern Maya area documented thanks to ethnohistorical data and ethnographic research. Among the many issues touched upon here, the chapter contains valuable information on modern agricultural practices among indigenous people collected by Mr. Gilewski during his own field research. It is indeed an important overview of ethnohistoric and ethnographic literature concerning history of the Southern Maya Area with a special emphasis on agriculture. The author shows both the changes introduced to the region as a consequence of the Spanish invasion and rule (new agricultural techniques, introduction of new crops, etc.), as well as continuities in agricultural traditions among the indigenous communities. From reading Chapter 4, it is clear that Mr. Gilewski is well-acquainted with the literature on the discussed subject. He aptly demonstrates that *milpa* agriculture was not based exclusively on maize, as we usually tend to think, but on a variety of other cultigens. Moreover, it varied from region to region and in some areas maize was scarce and major effort was devoted to the cultivation of other crops, such as cacao.

In the same chapter Mr. Gilewski describes various types of agricultural constructions documented in the Maya Highlands and on Pacific Coast. He also expands on some interesting topics such as land ownership, territorial organisation among the indigenous communities, fertilisers used in agriculture or symbolism of agricultural fields and of agriculture-related activities. These are extremely important issues. Gilewski's findings allow us to better understand many aspects of the functioning of the Maya communities of the pre-Columbian period, their farming methods, socio-political organisation and land management.

Chapter 5 introduces the reader to the archaeological site of Tak'alik Ab'aj, where Mr. Gilewski worked for several years. We find here information on the history of research, physical geography and climate of the region where Tak'alik Ab'aj is situated. Moreover, he talks about the cultural development of the site from its foundation until its abandonment. However, I have to admit that despite the author's intentions, this chapter is rather cursory and contains very little information about the cultural growth of Tak'alik Ab'aj. It contains almost

no information about the architectural evolution of the Central Group at Tak'alik Ab'aj throughout the Preclassic and Classic periods or about different styles of monuments, their chronological placement, etc. (topics presented in numerous publications by the Tak'alik Ab'aj team). All of the above would have been a nice introduction for a reader not familiar with the archaeology of this important coastal site. Their inclusion in the dissertation is important because information of this kind should constitute a historical and archaeological background for the subject that Mr. Gilewski presents in his work.

Chapter 6 presents results of research conducted by other members of the Tak'alik Ab'aj Project in peripheral areas stretching to the south of Central Group. The major aim of this research was to look for residential and agricultural potential of this area for the pre-Hispanic times. In 2015 in the frame of this research Mr. Gilewski conducted his own investigations aimed at searching agricultural zone in the southern peripheries of Tak'alik Ab'aj. For this purpose he carried out his own subproject during which he archaeologically tested the above-mentioned peripheries. He also collected paleobotanical materials which were subsequently subject of detailed analyses, the results of which, however, were not, as the author himself notes, satisfactory. However, the author convincingly argues that archaeological and botanical material collected from Área Sur C and Área Sur Oeste “provide strong evidence of the presence of agricultural production” (p. 194) due to the discovery of antropogenic soils and some seeds which may belong to crops/plants cultivated or planted here, including a possible presence of maize. Despite this scarcity of paleobotanical finds, which stems from poor preservation conditions, the peripheral zone of Tak'alik Ab'aj provides some evidence of the use of this area for agricultural and residential purposes. In my opinion, more excavations are needed, and of broader scope, to fully support this view. In this part, I have not been able to find information on the precise dating of the layers from which the samples originate, which would undoubtedly be relevant information (apart from the fact that they come from the pre-Hispanic period).

In the following Chapter (no. 7) Mr. Gilewski describes plant remains recovered during previous excavations conducted in Tak'alik Ab'aj. This part constitutes an important addition to the previous chapter. Worth emphasising is the fact that Mr. Gilewski had an opportunity to access macrobotanical remains stored at the Park laboratory and recovered during previous PANTA research, which he further analysed and contextualised in his dissertation. This enabled him (and other scholars of PANTA) to at least partly reconstruct a set of crops cultivated by pre-Hispanic inhabitants of Tak'alik Ab'aj. Identified in this group were maize,

cacao, avocado, coyol palm, corozal and others. It is important to mention that most of these remains can be dated to the Middle Preclassic period – a crucial time in Mesoamerican history when we observe the rise and development of agriculture-based, sedentary communities in Maya Highlands and Lowlands. An interesting fact is that Mr. Gilewski was able to demonstrate that the list of plant remains that he studied is similar to plants used by contemporary Maya. This is an important data indicating at least some kind of continuity in agricultural tradition/s between pre-Hispanic, Colonial and modern times.

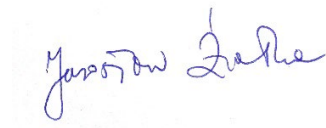
Chapter 8 is a compilation of data of geoarchaeological project conducted at Tak'alik Ab'aj as part of collaboration between University of Warsaw and National Archaeological Park of Tak'alik Ab'aj. Samples were collected from different parts of the epicentre and peripheries of the site for paleoenvironmental analysis. We learn that the samples were taken from previously excavated test pits as well as from bucket auger test investigations. In total, 109 samples were collected and subsequently sent to the University of Toruń in Poland. This is a really significant and reliable amount of samples facilitating a study of the chemical characteristics of the soils and the discovery of possible evidence of agriculture-related and/or residential-related modifications in the area of Structures 7 and 89 of Tak'alik Ab'aj.

In the final part of the dissertation (Chapters 9 and 10) Mr. Gilewski presents his concluding remarks and the major results of his work. He also mentions the limitations of his dissertation – one of which was a lack of data on lithic artefacts, many of which might have been used to process crops.

The scientific importance of Mr. Gilewski's work is that, to my knowledge, so far no one has attempted to study the subject of pre-Columbian Maya agriculture of the whole Southern Maya Area. Mr. Gilewski, apart of presenting a comprehensive and up-to-date state of knowledge about the analysed topic which is based on review of previous publications, also conducted his own investigations that contributed significantly to the subject of landscape modification and pre-Hispanic Maya agriculture in the Southern Maya zone. Based on ethnohistorical and ethnographic data, Mr. Gilewski convincingly shows that many aspects of pre-Hispanic agriculture remained unchanged till modern times in the Maya Highlands or Pacific Coast. This was one of the major scientific hypotheses of his dissertation which he proved to be correct.

To sum up, I think that Gilewski's doctorate, despite various editorial problems (grammatical errors, poor quality of some maps and figures, wrongly placed references to several tables and

figures, etc.) is a very mature work, which was created largely on the basis of independent analyses of a huge amount of archaeological, geoarchaeological, paleobotanical, ethnohistorical and ethnographic data. It is a highly original scientific work, which offers a lot of new information on Maya agricultural practices. I am of the opinion that Mr. Gilewski's dissertation, in every respect, meets the requirements and conditions for obtaining a doctoral degree in the field of humanities.

A handwritten signature in blue ink, reading "Jacek Zaleski". The signature is written in a cursive style with a large initial 'J' and 'Z'.