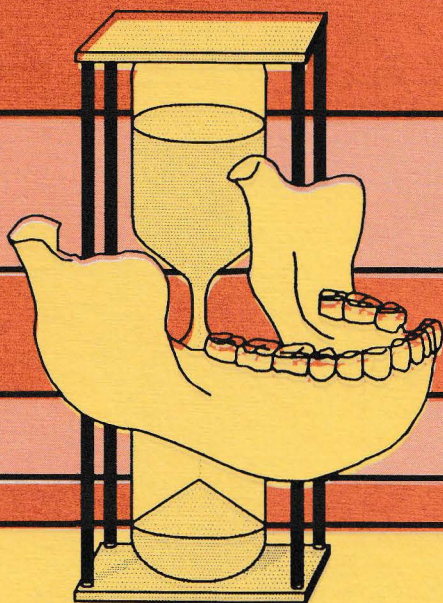


Edited by

Ernst Pernicka  
Günther A. Wagner

# ARCHAEOOMETRY '90



Birkhäuser

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1991

Birkhäuser Verlag  
Basel · Boston · Berlin

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Library of Congress Cataloging-in-Publication Data

**Archaeometry '90**/edited by Ernst Pernicka, Günther A. Wagner.  
Proceedings of the 27th Symposium on Archaeometry held in Heidelberg Apr. 2 – 6, 1990.  
Includes bibliographical references.  
ISBN 3-7643-2522-4 – ISBN 0-8176-2522-4  
1. Archaeometry-Congresses. I. Pernicka, Ernst. II. Wagner, Günther A. III. Symposium on  
Archaeometry (27th: 1990: Heidelberg, Germany)  
CC75.7.A729 1991  
930.1–dc20

Deutsche Bibliothek Cataloging-in-Publication Data

**Archaeometry '90**/ed. by Ernst Pernicka; Günther A. Wagner.  
– Basel; Boston; Berlin: Birkhäuser, 1991  
ISBN 3-7643-2522-4 (Basel . . .)  
ISBN 0-8176-2522-4 (Boston)  
NE: Pernicka, Ernst [Hrsg.]

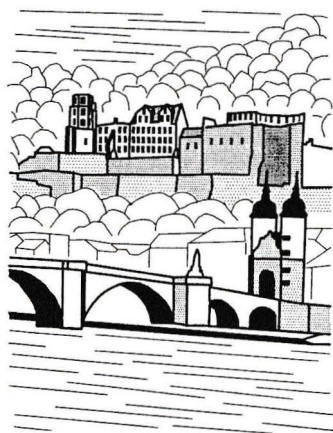
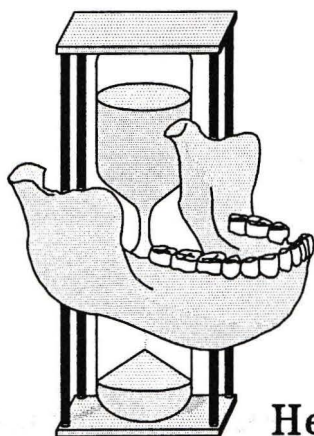
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P. O. Box 133  
CH-4010 Basel/Schweiz

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Printed in Germany on acid-free paper from the authors' camera-ready manuscripts  
ISBN 3-7643-2522-4  
ISBN 0-8176-2522-4

# INTERNATIONAL SYMPOSIUM ON ARCHAEOOMETRY



2-6 April 1990  
Heidelberg, Germany

## TIRYNS UNTERSTADT

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SUMMARY: Analysis of the Holocene stratification around the Mycenaean citadel at Tiryns show how the settlement's fate has been closely linked to a stream which had its original course south of the citadel. During the second half of the Late Helladic III-B period the stream shifted north of the citadel and buried large parts of the lower town under 3-5 m of mud and gravel. To prevent further destruction, the people of Tiryns constructed a dam to redirect the stream 1 km south of the citadel. All further sedimentation at Tiryns was thus cut off so that LH III-C ruins are still near the present surface.

## INTRODUCTION

The Late Bronze Age citadels at Tiryns and Mycenae in the Argive Plain, Greece, epitomise the exceptional degree of political and technological achievement of this earliest high culture on the European continent. Homer's account of the Trojan War combined with Schliemann's legendary excavations at Troy, Mycenae, Tiryns and Orchomenos have added to the fascination of this epoch. Although the Argive Plain had been a focal point of Greek cultures during various times in the past, e. g. in the Geometric, Archaic, Classic and Frankish periods, it never regained the outstanding importance of the Mycenaean era, when the whole Aegean and much of the eastern Mediterranean were controlled from the strongholds at Mycenae,

Tiryns, Argos, Berbati, Midea, and Asine. The Argive Plain was clearly the centre of the Mycenaean civilisation although prominent Late Bronze Age settlements existed outside the Argolid e. g. at Pylos, Thebes, Orchomenos and Iolkos (e.g., Hope-Simson 1981).

The Mycenaean civilisation appears to have been closely linked with the geographic position and environmental evolution of the Argive Plain. In the Illiad, Homer referred seven times to the agricultural prosperity of the plain of Argos, Aristotle described its historic changes in soil quality, Schliemann often pointed to environmental changes in his excavation reports (Schliemann 1885: 28) and Rhys Carpenter based his explanation of the Mycenaean demise on climatic change (Carpenter 1966). Because of this obvious interdependence between landscape and civilisation an understanding of the Late Bronze Age archaeological record can best be achieved when archaeological models are combined with accurate landscape reconstructions.

The Mycenaean citadel at Tiryns was established on an isolated limestone knoll, which at present is 26 m above sea level at its highest point and 1.6 km from the coast. It is close to the fertile soils of the plain, near the wide sandy beach, but still protected and safely founded on its 300 m by 55 m hillock. Nevertheless, there are a few such mounds in the vicinity offering a similar environmental setting and so far nobody has been able to provide a satisfactory explanation why this particular hill was chosen for such an important settlement. Lehmann (1937, 69) argued that this locality was in fact slightly disadvantageous for a Late Bronze Age citadel and that it was only kept for reasons of tradition.

Archaeological investigations of Tiryns began with a one day trial dig by Friedrich Thiersch and A. R. Rangabe in September 1831 (Thiersch 1866). Heinrich Schliemann conducted more trial excavations in the spring of 1876 and excavated the Oberburg during a 5 months campaign commencing in March 1884 (Schliemann 1885). Further intermittent excavations were carried out by the German Archaeological Institute between 1905 and 1929. The Cyclopean walls were reconstructed by the Greek government between 1957-60, and another major excavation campaign of the German Archaeological Institute which began in 1967 just came to an end in 1986.

The aim of the present study is to combine the stratigraphic record of earlier excavations in the lower town of Tiryns with a recent geological investigation, which was carried out to reconstruct the Holocene depositional history of the area. The results of this study were expected to clarify the prehistoric positions of the coastline and to provide the precise age and purpose of the Mycenaean dam at Kofini, 3.5 km ENE of Tiryns.

### LANDSCAPE SETTING

The coastal plains of the Peloponnese are well defined graben systems resulting from recent block tectonic faulting, which also generated Greece's rugged coastline and varied landscape. Segregated from other fertile regions by up to 1700 m high mountains, dropping steeply to the coast on its Arkadian side, the Argive Plain stands out among the Greek valleys, because of its protective separation, its favourable Aegean-oriented position, its pleasant climate, and its extensive arable soil.

The Mycenaean chose to establish their settlements on the foothills along the margins of the plain. The site pattern was thus more nucleated than at present and during most other times when people lived in villages near arable soil. Bintliff (1977) attempted to explain the unusual settlement pattern of the Late Bronze Age by equal distances between settlements and by changes of soil quality. According to Bintliff, the Argive Plain was an inhospitable swamp until the 'Younger Fill' was laid down during the last 2000 years. It has been shown, however, that no 'Younger Fill' deposition took place in the Argive Plain and that no significant changes in soil quality occurred after the Early Bronze Age (Finke 1988). These observations and recent discoveries of more prehistoric sites in the lower plain make Bintliff's model no longer tenable.

The character of the Mycenaean settlements and their locations were evidently chosen with protection in mind. A uniquely advantageous position was found for Mycenae, allowing the control of both, the Derwenaki and Berbati passes, the north and NE entrances to the plain, and permitting a commanding view of the entire area. The site

at the Argive Heraion controlled the Kleissoura, the western entrance to the plain, Tiryns protected the coastal access, Asine the SE shores and so on and so forth. Accordingly, something very valuable inside the plain must have required protection (human beings, fields, herds?) and something outside of it must have threatened the prosperity of the Mycenaeans.

#### SETTLEMENT HISTORY

Although a few Neolithic finds were made at Tiryns the oldest known buildings belong to the Early Helladic II (EH II) period. Around 2000 BC a circular building with 28 m diameter was erected on top of the limestone knoll and destroyed by fire during the same period. Stratified EH II/III layers have been found on the Unterburg and at some places south of the citadel (Jantzen 1975: 83; Verdelis 1963). A flourishing Middle Helladic settlement (MH) is recorded in foundations of large buildings on the Unter- and Oberburg and in the lower town, where stratified MH layers are over 2 m thick. The Middle Helladic settlement appears to have stretched especially towards the south and SE of the limestone hill, where Graben F and Graben H (Fig. 1) contained MH houses (Gercke & Hiesel 1971). No evidence of Middle Helladic constructions has been found north of Tiryns.

Three consecutive citadels with increasing size and fortification were erected at Tiryns during the Late Bronze Age. Very little remains of the first one (I. Burg, LH II), dating to 1500-1425 BC, which covered only the highest part of the hill (Oberburg). The original citadel was enlarged twice between 1425-1300 BC (II. Burg, LH III-A). The final palace (III. Burg, LH III-B), whose ruins are reconstructed today, was erected 1300-1230 BC, concurrently with the final expansion of Mycenae. According to Kilian (1988: 150) both palaces, Mycenae and Tiryns, were simultaneously destroyed by a large earthquake around 1200 BC. Almost at the same time the palatial civilisations collapsed and many Mycenaean settlements such as the Argive Heraion, Midea, Berbati and Katsingri were abandoned (Kilian 1982, 17). The subsequent LH III-C period (1230 - 1050 BC)

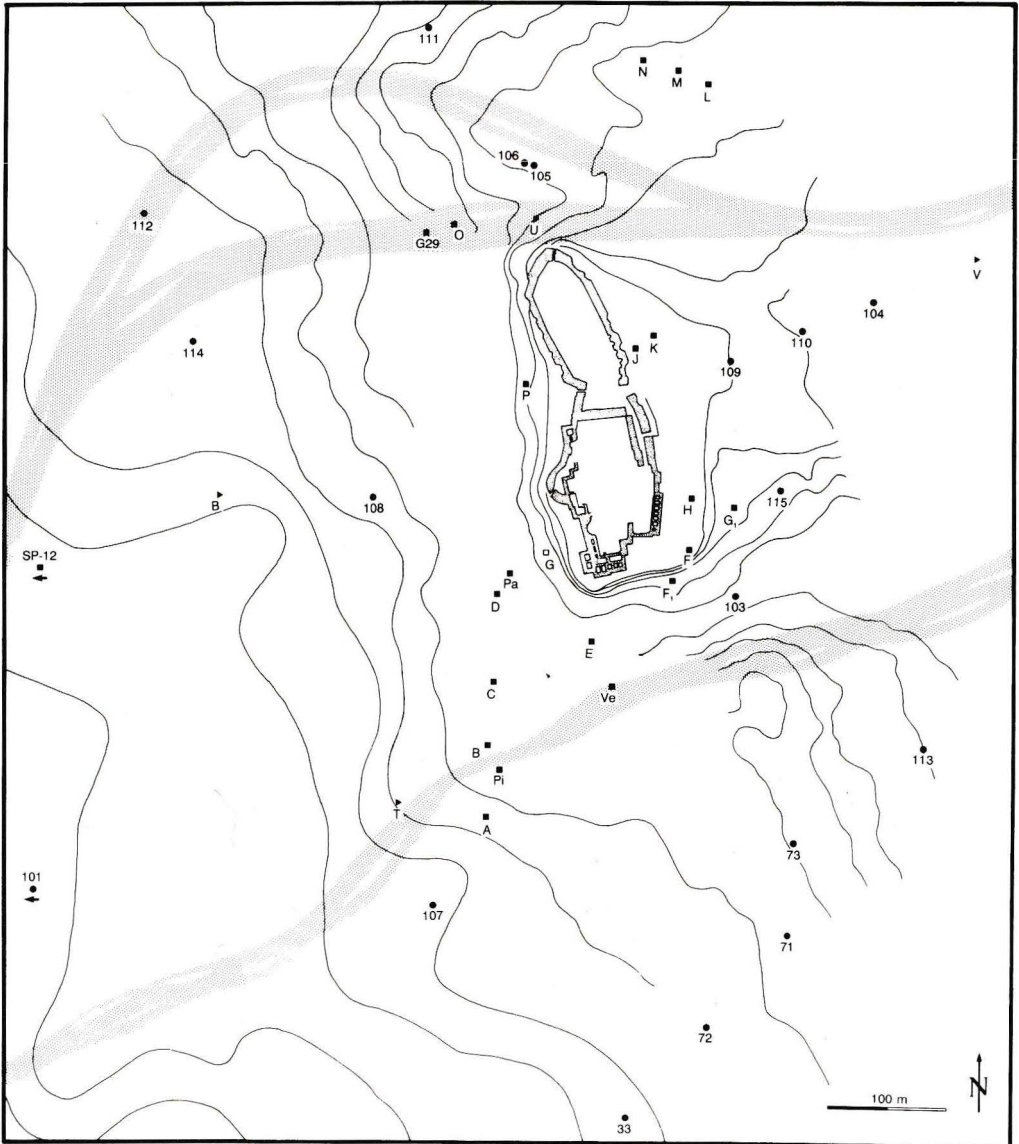


Figure 1: Map showing excavations (squares), construction trenches (squares), auger cores (dots) and drill holes (triangles) in the vicinity of the Tiryns citadel which provided insight in the subsurface stratigraphy. The shaded areas indicate the routes of former streams. The contours were taken from geodetic measurements by Grossmann and Pestal (Kilian, 1978) and from 1:5000 topographic maps. The contours are interrupted west of the citadel because of the obscuring effect of modern constructions.

saw a thorough redesign of the Tiryns settlement and a reforming of the community (Kilian 1988: 150). The Mycenaean civilisation deteriorated quickly and during the subsequent dark age the glamour of palatial life vanished from Tiryns. Although a Geometric temple and cemetery were found there, the site persisted only as a dwelling until its final desertion in 468 AD.

#### EXCAVATIONS IN THE LOWER TOWN

A number of excavations in the Lower Town of Tiryns were conducted from 1907 to 1929, though very few are recorded in detail (see Gercke & Hiesel 1971). Schliemann (1880) found 'Hellenic' pottery at the surface and painted prehistoric ceramic and obsidian tools in the subsurface. A Geometric cemetery with no Late Helladic pottery underneath was found in Graben A and B south of the citadel (Fig. 1). The later phases of LH were missing in trenches F and G1 to the SE of Tiryns, while nothing but LH pottery was found in trenches L, M, and N north of the citadel. However, Graben H, like most excavations within 50 m of the Cyclopean wall, produced artifacts from all three Bronze Age phases.

Towards the end of the 1929 campaign, when the excavators realized that their funding would not suffice to continue the work, a deep sondage was dug in Graben F to determine the whole stratigraphy down to the bedrock (Gercke & Hiesel 1971). An LH III-A house at 1 m depth in the trench was built on top of two consecutive LH I/II houses in 1.6 m and 2.1 m. In 2.5 m was a burnt horizon below which only Middle Helladic material was found. In a depth of 4.2 m another burnt layer separated EH III from EH II. Below this layer the soils turned more reddish and contained Neolithic pottery. Finally, the bedrock base of the red soil was found in 7 m depth.

In 1957, Verdelis conducted an emergency excavation on the prison ground 150 m south of the citadel (Verdelis 1963). His publication contained stratigraphic sections showing a 0.6 m soil A horizon at the surface, followed by a 0.7 m layer with mixed pottery and a stratified Late Helladic layer at 1.3-2.0 m. Middle Helladic pottery occurred at 2.0-2.4 m and Early Helladic material, including a wall

was found at 2.4-2.8 m. The lowest unit consisted of up to 2 m thick stream gravel deposits.

#### HOLOCENE DEPOSITIONAL HISTORY

The excavational record of Tiryns' Lower Town has always been described as fragmentary and confusing (e. g. Jantzen 1975: 6, 10, 59; Gercke & Hiesel 1971; Balcer 1974: 142). Thus, to obtain a comprehensive view of Tiryns' environmental and settlement history, an examination of the sediment and soil stratigraphy found in exposures, auger cores and drill holes was carried out in 1987, subsequent to a similar, much larger investigation of the whole Argive Plain (Finke 1988).

Only three excavations in the lower town were accessible in 1987. One of these, just west of the entrance of the prison at Tiryns, shows exposed profiles to a depth of 2.5 m (Fig. 1: Pi). Here, a levee wall with a sloping outer side separates a 1.8 m thick stratified EH settlement from stream gravel deposits. This excavation provides the evidence for an Early Helladic stream south of the citadel. It also shows, how the Early Bronze Age inhabitants protected themselves from the perennial floods of the stream by building a levee wall.

In 1987, a deep excavation was carried out by the Ephoria SW of the citadel (Fig. 1: Pa). The upper 2.8 m in this dig consisted of disturbed deposits containing abundant Mycenaean and Geometric pottery. A sequence of undisturbed, interlayered stream and floodplain deposits with EH pottery was exposed below 2.8 m. Homogenous alluvia, again including EH shards, followed from 3.95-5.2 m interrupted by a 5 cm layer of stream gravel in 4.3 m. A soil A horizon reflecting strong human activity was found in 5.2-5.45 m, underlain by an EH II-site at 5.45-6.0 m. This site had been established on an undisturbed, red Pleistocene paleosol which was unearthed from 6.0-6.8 m. The stratigraphy in this trench records a few thousand years of overbank loam deposition emanating from the stream south of the citadel.

Kilian (1978), in an excavation NW of the citadel (Fig. 1: G29),

found three building horizons from an early phase of LH III-C directly under the turf which covered 1.5 m thick sand and gravel deposits. LH III-B pottery below these deposits indicated a high deposition rate at the transition from LH III-B to III-C. This trench provides the evidence for a shift in the stream's path to the north of the citadel, which must have occurred late during the LH III-B period.

A number of hand auger and power drill holes supported the observations made in these recent excavations. Several meters of stream gravel deposits and coarse overbank loam dating back to the Early Bronze Age dominate the stratigraphy to the south of the citadel. The LH III-B alluvium, which was deposited during the stream's shift to the north reaches a maximum thickness of 4.8 m in core 104 (Fig. 1) about 150 m east of the citadel's main gate. The bed of the LH III-B stream can be traced north of the citadel. It is surrounded by 2-3 m thick alluvium. The uppermost unit in this area consists of a 1-2 m thick artificial fill, possibly dumped there during Schliemann's excavations. Finally, uniformly stratified deposits recording strong human activity since the Early Bronze Age were found on the west side of the citadel.

#### PALEOENVIRONMENTAL RECONSTRUCTION

Geoarchaeological investigations of the Argive Plain (Finke 1988) have shown that the Argive landscape had been stable from the Late Pleistocene until the end of the Neolithic. At that time, sea level was much lower than today and the coastal plain, consisting of a mature and fertile Pleistocene soil, extended beyond the present shoreline. The Holocene sea level rise shifted the coastline far inland of its present location, resulting in a maximum transgression during the Early Bronze Age at 2500 B.C., when a large part of the coastal plain was drowned. By then the landscape was no longer stable and extensive, several meter thick alluvia were deposited during the Final Neolithic and Early Bronze Age. This enhanced deposition forced the coast to regress soon after it had reached its peak position.

The large circular building at Tiryns, assumed to have been a cereal silo (Kilian 1986a), indicates the importance of the place during EH II, when the coast came as close as 300 m to the site. This construction and the important settlement at Lerna as well as ubiquitous EH II pottery (Finke 1988) and soil erosion point to dense inhabitation and intensive land use during Early Helladic II. The limestone knoll at Tiryns was at that time 6 m higher (25%) than today, relative to its surroundings. The Early Bronze Age inhabitation stretched along the foot of the hillock (Jantzen 1975: 83); its remains are now buried by up to 5 m of more recent deposits. The excavation across the prison entrance shows (Fig. 1: Pi) how the Early Bronze Age inhabitants contained the floods of the stream which used to run through their settlement, by channelizing it.

There are no indications for profound landscape changes during Early Helladic III and Middle Helladic. MH shards were found in the auger cores, but were not abundant. The stream kept its path south of Tiryns, where overbank alluvia record limited floods. It was still using this path during the Late Helladic period. During the second half of LH III-B the torrent shifted to the north of the citadel. Its sudden deviation away from the coast is explained by the alluvial cone, which had accumulated south of the citadel making this area topographically higher than the northern foot of the knoll.

There are two possible explanation for the catastrophic flash flood which buried the lower town: either it occurred during the initial shift of the stream, or this change caused only minor damage of the settlement but lead the inhabitants to circumvent similar future floods by redirecting the entire stream. The original dam could have collapsed during the earthquake at the LH III-B/C transition (Kilian 1986b) thus explaining the coincidence of earthquake and flood damage. Thick LH III-B2 deposits were laid down during the catastrophe east, south and north of the citadel burying much of the Lower Town and magnifying the quake's damage. Karo (1930, 112), digging through 3 m of this alluvium in one of his excavations SE of the Oberburg, had interpreted the lack of finds as an empty Late Mycenaean place.

The dam in its present form was built at the LH III-B/C transition. Its southeast front was secured with large square hewn blocks to prevent it from erosion. Remains of this wall are still visible today. A straight canal was dug towards the southern tip of the Profitis Ilias, where it joins another creek SW of the village of Aghios Adrianos. This redirection of the stream inhibited all further sedimentation at Tiryns, thus LH III-C ruins are still near the present surface. It appears to be the only Mycenaean stream redirection although the engineering is reminiscent of the hydrologic control of Lake Kopais.

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