The Cave of the Cyclops

Mesolithic and Neolithic Networks in the Northern Aegean, Greece

Volume II

Bone Tool Industries, Dietary Resources and the Paleoenvironment, and Archaeometrical Studies

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The Cave of the Cyclops

Mesolithic and Neolithic Networks in the Northern Aegean, Greece

Volume II

Bone Tool Industries, Dietary Resources and the Paleoenvironment, and Archaeometrical Studies

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List of Abbreviations

Bibliographic abbreviations follow the conventions suggested in the *American Journal of Archaeology* 111.1 (2007), pp. 14–34.

A	Trench A (originally Trench Alpha)
AP	aboreal pollen
B	Trench B (originally Trench Beta)
Byz.	Byzantine
C	Trench C (originally Trench Gamma)
ca.	approximately
cal.	calibrated
cat. no.	catalog number
CEast	Eastern division of Trench C
cm	centimeter
cont.	continued
corresp.	corresponding
CWest	Western division of Trench C
D	Trench D, extension of Trench A (originally Trench Delta)
DEM	sample from Laboratory of Archaeometry (Institute of Materials Science, NCSR "Demokritos") in Athens.
diam.	diameter
dim.	dimension
dims.	dimensions
dist.	disturbed
DOL	Dark-on-Light
DOR	Dark-on-Red
E	Trench E (originally Trench Zeta)
EDX	energy dispersive x-ray
EH	Early Helladic
EM	Early Mesolithic
EN	Early Neolithic
f.	form/*forma*

F	Trench F
FM	Final Mesolithic
g	gram
GRP	global rachidian profiles
h.	height
ha	hectare
indet.	indeterminate
km	kilometer
kyr B.P.	thousand years before present
L.	length
LM	Lower Mesolithic
LN	Late Neolithic
LOD	Light-on-Dark
m	meter
masl	meters above sea level
mg	milligram
µm	micrometer
mm	millimeter
max.	maximum
max. dim.	maximum dimension
Mes.	Mesolithic
MH	Middle Helladic
MN	Middle Neolithic
MNI	minimum number of individuals
N	north
NAP	non-aboreal pollen
NE	northeast
NISP	number of identified specimens
nm	nautical miles
no.	number
NW	northwest
pers. comm.	personal communication
pers. obsv.	personal observation
PPL	plane-polarized light
PPN	Pre-Pottery Neolithic
PPNA	Pre-Pottery Neolithic A
PPNB	Pre-Pottery Neolithic B
PPNC	Pre-Pottery Neolithic C
pres.	preserved
r	rounded
Rom.	Roman
ROW	Red-on-White
S	south
s	standard deviation
s^2	sample variance
sa	sub-angular
SE	southeast
SEM	scanning electron microscopy
sp.	species
spp.	species (plural)
sr	sub-rounded
SW	southwest
th.	thickness
UM	Upper Mesolithic
var.	variety
W	west
w.	width
WOR	White-on-Red
XP	cross-polarized light
yr	year
yrs	years

Introduction

The archaeological material presented in the first volume has demonstrated the importance of the Cave of the Cyclops, which unquestionably constitutes a byword in the prehistory of the Aegean. The information set out in the second volume mainly comes from the archaeological material, organic residues, and the archaeometric studies that complete the image of this significant archaeological site. Organic residues form a vast amount of material, and its systematic study proved necessary in order to ascertain the significance of the cave.

Particularly important is Prof. A. Moundrea-Agrafioti's study of Mesolithic bone hooks, which are unique. Their typology cannot be compared to any of its parallels, and the uniqueness of this material may have been responsible for the delayed submission of the study, which naturally should have been integrated in the first volume. The 55 bone hooks recovered comprise a body of material that so far is unique in the Aegean, adding to the importance of the archaeological research in the cave. The impressively wide variety of types and sizes from among the earlier to the more recent Mesolithic levels suggests a specialization in the fishing activities of these Mesolithic groups that settled in the northern Aegean. The variety of sizes, analogous to the hooks seen today, allows for a detailed typology. Consequently, it is highly likely that during the Mesolithic period the cave was used as a base and refuge during regular missions of fishing by exceptionally specialized fishermen.

Animal bones abound among the higher Neolithic levels of the cave. Animal bones were expectedly scarce among the Mesolithic levels, but the detailed study by Dr. K. Trantalidou proves an early domestication of sheep and goats that is contemporary to domestication in Anatolia, reflecting either an early provenance

from the east or a contemporaneous autochthonous domestication in the Aegean and broader contacts with Anatolia. At the end of the 9th and the beginning of the 8th millennium B.C., goats and sheep started to be domesticated at Youra. During the 8th millennium these became fully domesticated, but they had not made their appearance on the Greek mainland yet.

It is not my intention to emphasize the Aegean or downgrade the role of Anatolia, but I strongly believe that by highlighting the analogies rather than the immediate contacts, Anatolia may be described not only as a point of reference for the Greek neolithization, but also as another parallel area of activity. Irrespective of the birthplace, the intermediate sites, and the periphery as necessary constituents of a historical moving of people, now it is more important to abandon the theory of one nuclear zone and instead adopt the theory of multiple centers of neolithization that sprang up at the same time under social circumstances that facilitated this turn. It follows that the Aegean—according to recent studies on its reserves of wild fauna and flora—could be one of these centers. The theory of "multi-focus neolithization," which is put forward here, can account for the contemporaneous development of the neolithization of sites in Iran, southeastern Turkey, Syro-Palestine, and Cyprus.

The economy of the Mesolithic is featured in meticulous studies on fish bones by Dr. J. Powell and Dr. D. Mylona. The cave at Youra is the only site so far that yielded so many fish finds and such a variety of species. All the species identified in the archaeological assemblage continue to exist today, and the same families predominate. Marine exploitation during the Mesolithic and Neolithic periods concentrated on coastal demersal species and only a few large pelagic species. It is explicitly suggested that marine exploitation dramatically declined toward the end of the Mesolithic, as at Franchthi. Scombridae, Mugillidae, Scorpionidae, and Serranidae dominate in the earlier levels, but there is a discrepancy in the number of vertebral and cranial remains. Sparidae and Serranidae are the most common species in later Mesolithic strata; and in the EN and MN, Sparidae dominate, and the Scombridae species is the second most important group, including medium-sized fish.

The Mesolithic fishermen of Youra exploited two major fish sources, the plentiful migratory fish (i.e., Scombridae and Carangidae) that appeared only seasonally, and the coastal fish available on a year-round basis (e.g., Sparidae, Serranidae, Scorpaenidae). The practice of net fishing resulted in numerous fish of exceptionally small size. While most of the coastal species could arguably be caught from the coast, the fishing of the migratory species presupposes the use of boats. Generally, there is no special interest in the fishing of migratory species, a common practice today in the area of the Northern Sporades.

According to Powell, the Late Neolithic (LN) people seem to possess more skill in targeting desirable species such as *Epinephelus* sp. (ροφοί), and thus they are thought to have developed specific strategies that suggest more sophisticated fishing methods—specialized hooks for particular species and perhaps gill nets—and also a better understanding of the environmental conditions. However, the cave has not provided evidence of these skilled fishing activities for the LN period, and it is probable that another site in the Northern Sporades served as a base for specialized fishing.

The vertebral assemblage in the cave suggests the systematic processing and conservation of fish through drying, salting, or smoking processes. Hearths are commonly associated with floors, and the connection between the burned fish remains and floors is obvious. The cured fish could be stored deep in the cave, where the conditions for preservation were excellent. The preservation of fish was extensively practiced only in some periods, one probably being the Lower Mesolithic (LM).

Concerning Franchthi Cave, the studies on its fish assemblage have not been completely published yet, but the evidence is analogous to that from Youra. Sparidae is the dominant family, and individuals are generally small to medium in size. What differs is the presence of large tuna in Upper Mesolithic (UM) levels at Franchthi. The fish bone assemblage of Mesolithic Kythnos is still under study, but the presence of large tuna is evident.

The intense fishing activities in this area during the Mesolithic can be accounted for in more than one way. The Northern Sporades—specifically the Deserted Islands—is one of the best fishing places in the Aegean. In Mesolithic times the channels between islands were narrower, but their crossings did not pose serious problems for the local population. In the 9th millenium B.C. the island of Youra was much bigger, and it most likely was attached to Psathoura, the northernmost island of the archipelago complex. In some places, such as banks, the shallow sea may have been rich in nutrients for the fish. The Mesolithic inhabitants of the northern Aegean likely experienced dramatic changes of the environment, and they had to deal with all the adversities without being able to use older, alternative practices such as hunting. It is very probable that the new climatic conditions of the Holocene created different microenvironments in the Aegean, greatly affecting the population, maybe to a greater extent than in western Europe.

The need to exploit the marine resources for food and the search for proper raw material for the production of tools should account for the development of seafaring in the Northern Sporades. A large exchange network is suggested by the presence of Melian obsidian, as well as flint and bone material for the fabrication of bone hooks. At the same time, on Youra we observe that a systematic collection of shells and terrestrial mollusks took place that could prove significant. The whole material has been studied by Prof. L. Karali of the University of Athens. The numerous snails found in every Mesolithic level attest to the systematic consumption of terrestrial mollusks, a practice also noted in the Mesolithic levels of the caves at Franchthi and Kythnos.

Unfortunately, the paleobotanic residues have not shed enough light on the issue of plant domestication, a practice that one would expect to accompany the early animal domestication. Despite meticulous water sieving, which was hindered by the scarce water resources on the deserted island of Youra, the natural residues were rare. Aside from this, it was quite unfortunate that only a small part of the material was put under study; the majority of the material, which, even though it was entrusted to the hands of Dr. A. Sarpaki by Dr. S. Katsarou, was mysteriously lost. Thus, the scarce vegetal samples—which possibly are examples of early domestication compared to the rest of the nutritional remnants—lead to unsound conclusions regarding plan domestication. This has been quite an unfortunate incident, because the extensively discussed issue of the neolithization of southeastern Europe could only benefit from archaeobotanical finds from the Mesolithic or the Neolithic levels. However, considering the morphology and the arid environment of the island, the cultivation of plants as early as the Neolithic is quite unexpected, even though certain wild cereal would not be unlikely.

Dr. M. Ntinou's thorough examination of the carbon material has given sufficient evidence of the environment of Youra and the broader area concerning every phase of the cave's settlement. This information was also complemented and verified by the palynological study of samples from Mesolithic and Neolithic levels of the cave by Dr. Ch. Ioakim. During the LM, the vegetation was dominated by herbaceous plants belonging to the Cerealia-type, Poaceae, Ranunculaceae, and Rosaceae families. This type of vegetation, found in Philippi (central Macedonia), befits cold and dry climatic conditions. In the UM the herbaceous vegetation clearly replaced a mixed woodland

dominated by *Quercus* and *Pinus*. The rich herbaceous vegetation suggests that the woodland was not dense. Similarities are seen among Youra and other early Holocene sites in Greece such as Giannitsa, Ioannina, Lake Xinias, and Argos.

Archaeometric research on the dating of Mesolithic strata was carried out by Dr. Y. Facorellis. Trial ^{14}C dates on animal and fish bones, shellfish, and land snails were performed by the Laboratory of Archaeometry at the Institute of Materials Science, NCSR "Demokritos," in Athens, and further certified by $\delta^{13}C$ measurements performed by the University of Heidelberg, Germany. The results were associated with the charcoal ^{14}C dates from the very same strata. Dates from the above materials appear to diverge regularly by some hundreds of years from the charcoal samples due to the different quantities of oxygen absorbed by plants (charcoal), shellfish, land snails, and mammals. The correlations can be very useful for sites where no charcoal is found, and they are necessary for the estimation of the local marine reservoir effect in every region. Using terrestrial and marine samples from a site in conjunction with the latest issue of the marine calibration curve one can obtain the local constant (ΔR). And, when used together, the local marine reservoir effect and the local constant (ΔR) allow for reliable absolute dating.

Particularly important are the archaeometric analyses of pottery samples from every Neolithic phase that show that the Middle Neolithic (MN) inscribed pottery of exceptional quality found in the cave is not linked to the respective pottery of the same era in Thessaly but instead belongs to a pottery group that proliferates in the Northern Sporades. Samples from the later Neolithic, which were studied by the archaeologist Ms. K. Papakosta, showed that during this period the cave's pottery was strongly attached to Thessaly, Euboea, and the rest of the Aegean.

The study of the stable isotopic data from marine mollusks found at the cave was carried out by Dr. A. Drivaliari and Prof. I. Liritzis. Even though the study was based on few samples and the margin of error is quite large, the results show that during the early Holocene climatic changes took place every 1,000–1,200 years. At the Cave of the Cyclops, a warmer climatic period during the LM (8500–7700 B.C.) was traced, which was followed by a colder phase during the UM (7700–6900 B.C.). A rise in temperature was noted in the Final Mesolithic (FM, 6900–6500 B.C.), and the LN (5300–4300 B.C.) featured a cool transitional stage.

Finally, the study by Ms. K. Theodorakopoulou and Dr. I. Bassiakos on the clastic cave sediments of anthropogenic origin have helped to shed light on the paleoenvironment and paleoclimate of the early Holocene. Chemical elements such as potassium, aluminum, and silicone could indicate cold temperatures and intense solifluction. The significant rise of these elements during the start of the UM attests to a cold period that probably led to the limited usage of the cave; this is in accordance with the readings of phosphorus, which suggest human activity. The readings of magnesium, which indicates warm and humid climatic conditions, coincide in some layers with the levels of calcium—another indicator of a warm and humid climate.

Even though we still have a long way to go until the riddle of Mesolithic occupation in the Greek area is solved, we can distinguish the main characteristics of the Mesolithic culture in the Aegean basin. These include: intense exploitation of sea resources, limited hunting activities, collection of grains and land snails, attempts at animal domestication by isolated island communities, and cave inhumations or open cemeteries. The presence of Melian obsidian, the flint, and the raw material for the manufacture of grinders and bone hooks suggests a large network of exchange for this period. The sea route via the Euboean gulf—known since the

Bronze Age and the historical periods—was probably in use during Mesolithic times despite the difficulties posed by primitive means of seafaring.

The considerable distance between Youra and Melos reveals a complex network of trade activities and large-scale movements present in the Aegean since the 9th millenium B.C. These activities in the Mesolithic northern Aegean probably were deeply rooted in an Upper Paleolithic tradition, because the sudden development and the specialization in fishing (given the perfection of the tool equipment) seen at the beginning of the Mesolithic are unusual. The resemblance of the lithic industry of the four Mesolithic settlements at Kythnos to the three recently unearthed Mesolithic sites of Ikaria, and the sets of microliths found at the Öküzini and Belbidi caves in Antalya (10,000–7800 yr B.P.) might suggest voyages in the Aegean and contact between Aegean cultures and southwestern Anatolia since this early period.

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