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PROJECT »EARLY FARMING IN DALMATIA«: POKROVNIK 2006

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Pokrovnik is the second site excavated as a part of the project Early Farming in Dalmatia. The aim of the project is to explore the spread of farming in Adriatic region, as well as its further development within the local landscape. Pokrovnik has deposits of both the Early (Impressed Ware) and Middle (Danilo) Neolithic phases; it thus complements the sequence from the site of Danilo Bitinj where the excavated deposits were of the Danilo culture phase. According to preliminary results, farming reached Dalmatia in fully developed form, probably brought by immigrating farmers.

AIMS OF THE RESEARCH

The *Early Farming in Dalmatia* Project is investigating the development of farming in the Adriatic region from the beginning through the Neolithic. The focus of our research is on central Dalmatia as this region contains remains of large Neolithic villages with substantial sequences of

occupation. Thus far, we have conducted three seasons of excavation and other research at Danilo Bitinj (MOORE – MENĐUŠIĆ 2004; MENĐUŠIĆ 2005; MARGUŠ – MENĐUŠIĆ – MOORE 2005; PODRUG 2007; see the article on Danilo Bitinj 2004–2005 excavations in this volume), and have also begun to carry out extensive studies of the landscape. This will help us to understand the changes that took place in the environment following the arrival of farming.

We are examining the evidence for agriculture through the entire Neolithic sequence, beginning in the Impressed Ware, or Early Neolithic, phase. Pokrovnik has deposits of both the Impressed Ware and Danilo, or Middle Neolithic, phases. It thus complements the sequence from the site of Danilo Bitinj where the deposits we excavated were of the Danilo culture phase. In our excavations we take great care to recover as much information as possible about the economies of the sites, principally from charred plant remains and animal bones. Comparing the evidence for economy from Danilo and Pokrovnik, two sites just 11 km apart yet in somewhat different environmental settings, will considerably enlarge our understanding of how farming developed in central Dalmatia.

Our particular objectives at Pokrovnik during the 2006 season of research were to delimit the extent of the site, and to excavate a series of trenches to the subsoil that would provide fresh information on the sequence of occupation there. As at Danilo, we employed a total recovery strategy that yielded large amount of archaeological artifacts and samples of charred plant remains and animal bones for study. Our geological colleagues mapped the site and its vicinity, and also studied the soils of the locality. This research will help to establish the environmental setting of the site, and its recent geomorphological history. We are becoming aware that the Dalmatian landscape has undergone continuous, often rapid, change from the Late Pleistocene through the Holocene. We seek understanding of how this affected the development of agriculture, and, in turn, to what extent the coming of farming contributed to those changes.

The project of which this is a part is a collaboration between the City Museum of Šibenik (M. Menđušić, E. Podrug), City Museum of Drniš (J. Zaninović) and Rochester Institute of Technology, U.S.A. (Dr. A. Moore). It is directed by Andrew Moore and Marko Menđušić with, in 2006, the valuable participation of Joško Zaninović. Numerous other scientists and institutions are contributing to the project.

NATURE OF FIELD RESEARCH

The Neolithic site of Pokrovnik lies at the foot of the north-western end of a limestone ridge, the Mideno brdo, and on the southern edge of the present-day village (Figure 1). It occupies a gently sloping shelf below a hill which is topped by a prehistoric *Gradina* (hill-fort) that encircles the church of Sveti Mihovil, a prominent landmark. At the bottom of the hill, and therefore at the upper edge of the site, there is an impressive spring called Pećina, the only reliable source of water in the district. The site itself looks out over the gently sloping terrain of a broad valley. Thus, its catchment consists of two zones, the limestone ridge behind and the valley floor in front. The gorge of the Čikola River is only 4 km to the north while the Adriatic, visible from the heights behind the site, is just 18 km away.

A single strip field 140 m long transected the site, and was available for excavation. We had surveyed this field in 2004 using ground penetrating radar (GPR). That survey had indicated that almost the entire field contained evidence of sub-surface features, most of which were presumably made by the prehistoric inhabitants. We excavated four trenches down the length of the field, thus revealing a cross-section of the inhabited area of the ancient village (Figure 2). As at Danilo, we used dry sieving and flotation routinely to recover the largest possible samples of plant remains,



Figure 1. The location of the Neolithic village of Pokrovnik, from the north. The archaeological site lies at the foot of the hill on which the church of Sveti Mihovil stands. The area covered by the site is within the dashed line.



Figure 2. Location of four trenches in a single field that transected the site (view from the south-east).

bones, and artifacts. All three categories were relatively well preserved, so we obtained larger samples of each than in previous seasons at Danilo.

The site at Pokrovnik was previously excavated by Professor Zdenko Brusić in 1979. He located seven trenches in the three fields on either side of the one in which we worked (BRUSIĆ 1980; MENĐUŠIĆ 1998: 52–54).

We established the size of the site through careful field walking. We also carried out an informal survey of the vicinity to see what other evidence for prehistoric and later settlement there might be nearby. Beginning in the 2006 season, in collaboration with Dr. Jadran Kale, ethnologist at the City Museum of Šibenik, we also began to interview local farmers about traditional farming practices in the district. This information is already providing useful insights for interpreting the evidence of farming from the site itself.

ARCHAEOLOGICAL RESULTS

The fieldwork lasted six weeks (from 12 June to 21 July). As at Danilo, through examination of the surface indicated that the occupied area at Pokrovnik was considerably larger than had been thought. The site is approximately 3 ha in extent. Significant and continuing surface erosion has removed an unknown but presumably substantial amount of sediment from the surface, exposing the Neolithic levels. It is likely, therefore, that the site was once more extensive than it appears today. The weathered topsoil horizon was relatively shallow, and the Neolithic deposits beneath were largely intact and relatively undisturbed.

The four trenches were labeled D, A, C and B in order from the top of the field to the outer edge. D, A and C yielded essentially similar sequences, with up to 1 m of Impressed Ware deposits overlain by 1 m of Danilo culture levels. B proved to be beyond the regular area of habitation and so yielded very little material.

The subsoil consisted of dense red clay that had presumably washed in during the later Pleistocene to cover the underlying limestone bedrock. In Trenches D and A the inhabitants had cleared this surface off and established their habitations on it. The remains of the Impressed Ware settlement consisted of patches of stones and multiple layers of habitation debris, hearths and occasional pits. These levels contained abundant artifacts and animal bones as well as charred plant remains. Then, soon after the foundation of the village, the inhabitants built massive stone walls from north to south across the site, at right angles to the original slope. We found remains of these walls in all three of the main trenches, D, A, and C (Figure 3). The stone walls probably served as terrace and boundary walls, given their bulk and orientation. They were covered by a further accumulation of occupation debris.

The transition to the Danilo culture phase of occupation seems to have been relatively swift. The levels of this later village consisted again of dense occupation debris and traces of walls. Pieces of daub were an abundant find, derived from collapsed buildings. There were also numerous pebble pavements that had been laid down to consolidate the sticky clay surface of the site. As in the Impressed Ware settlement, artifacts were abundant.

Trench C had the same sequence of occupation but the deposits were shallower. They consisted of a series of stone walls in a complex arrangement. Again, the most likely interpretation is that these served as terrace or boundary walls, this time, however, at the edge of the settlement. There was considerable evidence of wear, probably from the hooves of animals, on the limestone natural surface and on paving associated with the stone walls. So, animals passed alongside the walls often.

We recovered a massive amount of pottery from all phases of occupation, including the Impressed Ware levels. Other artifact categories were well represented, for the most part, including



Figure 3. Trench A, from the north. A large, multi-phase, stone wall crosses the trench from north to south (scale 1 m).

bone and stone tools. Flint tools and obsidian were only sparsely represented, however, and there was very little marine shell, presumably because the site was some distance inland from the coast. The Impressed Ware pottery was much more varied than expected, and a relatively high proportion of it was decorated in a variety of rough incised patterns. Overall, the vessels were quite large, thick-walled, and simply made. One remarkable find from the basal levels of the Impressed Ware settlement was a largely intact female clay figurine (Figure 4). This piece was remarkably well made, representing a true art object in the quality of its conception and execution. The Danilo pottery was extraordinarily abundant and some of it was decorated exuberantly with incised designs. The obsidian and marine shell came almost entirely from levels of the Danilo phase settlement. Thus, the evidence for maritime contact was largely confined to the Middle Neolithic village.



Figure 4. A female baked clay figurine, almost complete. She is shown with a cloth across her lap, indicated by incised marks. The incisions have been filled with red paint (scale 5 cm).

This is a counterintuitive observation given that it has usually been thought that during the Impressed Ware phase the inhabitants of this region and much of the rest of the Mediterranean were in regular contact by sea.

EVIDENCE FOR THE ECONOMY OF THE SITE

Professor Anthony Legge recorded and analysed the animal bones as the excavation proceeded. He reports the percentages of animal bones from all levels of the site to be as follows:

Domestic caprines, <i>Ovis aries</i> , <i>Capra aegagrus</i> (ovca, koza)	82.5%
Domestic cattle, <i>Bos Taurus</i> (govedo)	15.3%
Domestic pig, <i>Sus scrofa</i> (svinja)	0.5%
Red deer, <i>Cervus elaphas</i> (obični jelen)	0.7%
<1%: domestic dog (<i>Canis familiaris</i> , pas); roe deer, <i>Capreolus capreolus</i> (srndać); fox, <i>Vulpes vulpes</i> (lisica); badger, <i>Meles vulgaris</i> (jazavac); tortoise, <i>Testudo</i> (obična kornjača); hare, <i>Lepus capensis</i> (zec); possibly wolf, <i>Canis lupus</i> (vuk, present in the vicinity today); wild pig, <i>Sus scrofa</i> (divlja svinja).	

These preliminary data are remarkably similar to those from our research at Danilo Bitinj. Legge's initial examination suggests that the inhabitants were exploiting domestic animals from the inception of the settlement in the Impressed Ware phase. Hunting seems to have contributed minimally to the diet.

Dr. Susan Colledge and Kelly Reed have examined some of the plant remains. Among the species they have identified so far are the following:

Domestic plants:

- Barley, *Hordeum sativum* (ječam)
- Emmer, *Triticum dicoccum* (dvozna pšenica)
- Einkorn, *Triticum monococcum* (jednozna pšenica)
- Broomcorn millet, *Panicum miliaceum* (proso)
- Flax, *Linum usitatissimum* (lan)
- Lentil, *Lens* sp. (leća)
- Grass pea, *Lathyrus sativus* (sjetvena kukavičica, tj. sjetvena graholika)

Wild fruits:

- Cornelian cherry, *Cornus mas* (drijen)
- Rosehips, *Rosa* sp. (ružin šipak)
- Elderberry, *Sambucus nigra* (crna bazga)
- Blackberry, *Rubus fruticosus* (kupina)

Again, these results support the view that the inhabitants were heavily engaged in arable cultivation of domestic crops for food.

All the evidence that we have accumulated thus far is tending in a single direction: that farming reached Dalmatia as a comprehensive system, that it was based on a variety of domestic crops and animals brought in from elsewhere, and that the new economy was swiftly imposed upon, and adapted to the Dalmatian landscape. The transition to farming appears to have been abrupt here, and had an immediate and permanent effect upon human settlement and culture, as well as the environment.

A comprehensive set of AMS radiocarbon dates will be obtained for Pokrovnik in the months ahead. The samples used will be single, charred, domestic cereal grains.

As our research has proceeded, we have come to realize that we need to understand the ecology of agriculture in Dalmatia and, especially, the constraints that have conditioned farming in the longer term. To this end, we decided that it would be helpful to learn more about traditional farming practices in Dalmatia in order to understand how farming may have been carried out in the Neolithic. Accordingly, with Dr. Jadran Kale we began an agricultural survey by interviewing farmers in the region to determine some of the basic elements of their animal and crop husbandry, and the rhythm of the agricultural year. This research represents an extension of our enquiries into the field of ethnography. Thus far, we have interviewed five farmers and other experts from Pokrovnik and Danilo. The results are encouraging, and we plan to extend the survey in later seasons.

Most farming today and in the recent past has been for subsistence. A wide range of crops is grown and animals kept in order to reduce risk. The list of species cultivated is longer than in the archaeological record from Danilo and Pokrovnik, though factors of preservation may contribute to this apparent difference. Every part of the plant and animal has a use.

The rural economy is dominated by sheep and vines. In the earlier twentieth century these were of much greater importance than today, and provided the main source of cash income: wool, meat, and cheese from the sheep, and wine from the vines. Today, sheep are kept for cheese and meat but wool is no longer saleable for profit, and the wine produced in the villages is largely for home consumption. Everyone in a village knows the carrying capacity of the land for sheep. At Pokrovnik a generation and more ago two families dominated shepherding. As they reduced their flocks, other families increased the numbers of their animals so that the total kept by the village remained the same. Here we see an important ecological constraint limiting animal husbandry that would have operated from the beginning.

Transhumance used to be a mainstay of animal husbandry throughout Dalmatia until a generation ago (see for example, NIMAC 1940). Today, a few villages only continue to send their animals, mainly sheep, into the Dinaric Alps for summer pasture. Danilo, though no longer Pokrovnik, is one of those. We spent a day at the shepherd's settlement at Bezdanka, a high valley below Mt. Badanj and north-west of Mt. Dinara, to interview them. They were responsible for a combined flock of 200 animals, far fewer than the many thousands that would have been typical a century ago (Figure 5). The information recovered in the interviews, however, was important for the insights it



Figure 5. Sheep on their way to summer pastures in the Bezdanka valley, Dinaric Alps.

provided on this ancient practice. During our excursion into the mountains we explored the high valley used today for summer pasture carefully, and found definite evidence of Iron Age seasonal settlement there in the form of potsherds eroding from ancient intact habitation deposits. So, clearly this element of the shepherding economy is very old. It remains to be seen when it began.

GEOMORPHOLOGICAL RESEARCH

The geological team collected data to construct a detailed topographic map of Pokrovnik and its vicinity, conducted soil surveys, and studied the hydrology. This research will illuminate the nature and formation of the archaeological site and its setting. Smith reports on these investigations:

«We again used the differential GPS to perform a topographic survey of the Pokrovnik site and its environs. In addition to surficial soil survey and trench sampling, we dug a series of test pits surrounding the site, in an attempt to understand further the heterogeneity in soils properties as observed from surficial studies both at Danilo and at Pokrovnik. The spatial variation observed at the surface was reflected in highly variable textures and soil thicknesses observed in test pits. We tentatively ascribe this variation principally to a highly irregular bedrock surface, controlled in part by variable bedrock solubility, overlain by soils ranging from 0 cm to <2m in depth. The land surface has obviously undergone significant erosion, with deep soils present only in disconnected pockets. We are investigating ways of constraining the timing and extent of this erosion.»

Pokrovnik has archaeological deposits up to two meters deep, and these are very little disturbed. This is in contrast with the otherwise apparently heavily eroded surroundings of the site. Smith suggests that it may actually lie in a large sinkhole, and that this would account for the preservation of the deposits. The sequence of occupation recovered in our trenches matched that of Brusić' excavations: a solid deposit of Impressed Ware with Danilo occupation on top, and traces of Hvar culture, or Late Neolithic, material near the surface. Surprisingly, given the presence of the well, there was no later material from our trenches or on the surface in the near surrounding countryside.

The hill overlooking the site is capped by the church and graveyard of Sveti Mihovil, a conspicuous landmark. This complex is ringed by a Bronze Age fortress wall, or *gradina*, that was probably used in later times also. A vessel of Hvar culture, or Late Neolithic period was found in a pit of a recent grave near the top of the hill, now in the City Museum of Drniš (MENĐUŠIĆ 1998: 54, n. 60), and we located intact Neolithic occupation deposits with Danilo pottery also on the upper slopes. Thus, people first began to use the hilltop during the Middle Neolithic and then through most succeeding periods until the present, suggesting that a need for physical protection emerged very early in this region.

We anticipate that the geomorphological research and related landscape studies will continue in future field seasons.

CONCLUSION

The 2006 season at Pokrovnik yielded results that were important in themselves for understanding the nature of the site and the way of life of its prehistoric inhabitants. It was even more successful in other ways as it confirmed and considerably amplified our emerging understanding of the nature of settlement and economy in central Dalmatia during the Neolithic. In brief, it appears all but certain that farming reached Dalmatia in fully developed form, probably brought by immigrating farmers. They immediately established permanent settlements in favorable locations that

soon grew into large villages. This had a swift impact on the landscape, the full extent of which we need to determine in future research. This set human societies in Dalmatia on a new course that would ultimately lead to more complex cultures and dense peopling of the region.

The project continues to achieve such important results and insights because of the continued excellent collaboration of archaeologists and other scientists from Croatia, the U.S.A., and Britain. We all benefit from the contributions of each of our colleagues, and this strengthens the project.

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SAŽETAK

PROJEKT »RANO POLJODJELJSTVO I STOČARSTVO U DALMACIJI«: POKROVNIK 2006

Early Farming in Dalmatia je projekt međunarodne suradnje Muzeja grada Šibenika, Gradskog muzeja Drniš i Rochester Institute of Technology (USA), uz sudjelovanje stručnih suradnika iz nekoliko drugih institucija. Cilj projekta je istražiti početke i daljnji razvoj poljodjelstva i stočarstva u jadranskoj regiji kroz neolitik. Dalmacija, koja je zbog planinskih lanaca prirodno odvojena od unutrašnjosti Balkana i stoga više orijentirana morskim pravcima migracija i trgovine, iznimno je pogodna za proučavanje širenja neolitizacije. Naglasak projekta dat je središnjoj Dalmaciji – području u kojem su dosadašnjim istraživanjima ubicirana nalazišta većih neolitičkih sela, a među njima se osobito ističu Danilo Bitinj i Pokrovnik, koji su međusobno udaljeni 11 km. Nakon tri istraživačke kampanje u Danilu (2003–2005), četvrtu, ujedno i završnu sezonu terenskog dijela rada na projektu, iskopavali smo u Pokrovniku. Dok je na položaju Bitinj u Danilskom polju riječ o srednjoneolitičkom lokalitetu, Pokrovnik sadrži bogate slojeve rane (impresso kulture) i srednje (danilske kulture) faze neolitika, što ga čini iznimno zanimljivim i važnim lokalitetom.

Nalazište je smješteno u podnožju prapovijesne gradine, na rubu polja, u neposrednoj blizini izvora vode zvanog Pećina. Od Drniša je udaljeno oko 9 kilometara u smjeru jugo-zapada. Prvo, zaštitno istraživanje Pokrovnika vodio je 1979. godine Zdenko Brusić, kada je iskopano 7 sondi unutar triju zemljišnih parcela. Nakon georadarskog snimanja terena, tijekom ljeta 2006. godine smo istražili 4 sonde na parceli koja je za Brusićevih iskopavanja ostala neistražena. Neolitičko se naselje, međutim, širi i izvan istraženog prostora, te pretpostavljamo da obuhvaća oko 3 hektara površine. Radi sakupljanja što veće i raznovrsnije količine materijala, a tako i onog životinjskog i

biljnog porijekla, uz klasično iskopavanje, koristili smo se i metodama suhog prosijavanja i flotacije iskopane zemlje. U trima sondama (A, C, D) otkriveni su do 2 metra duboki slojevi naseljavanja tijekom impresso i danilske kulture; sonda B, na krajnjem zapadu parcele, pokazala se plićom i označava rub naselja. Izuzev tankog površinskog sloja oranja, u kojem je također bilo danilskih nalaza, stratigrafske jedinice bile su uglavnom intaktne, te su ponudile veću količinu i bolju očuvanost nalaza i uzoraka nego na Bitinju. Već na crvenoj zdravici, otkrivene su nakupine kamenja, vatrišta i jame impresso faze koje označavaju početak naseljavanja položaja. U daljnjim slojevima impressa, istraženi su segmenti temelja masivnih kamenih suhozidova, koji su, sudeći po njihovoj širini i orijentaciji, vjerojatno služili kao ograde ili radi terasastog oblikovanja prirodne padine terena. Iz impresso horizonta potječe nalaz antropomorfne plastike (keramička figurina u sjedećem položaju). Slijed vertikalne stratigrafije u Pokrovniku upućuje na nagli prijelaz prema danilskoj kulturi. U slojevima danilske faze nastavljaju se strukture kamenih temelja zidova, uz pripadajuća popločenja od nepravilnog kamenja, vatrišta i fragmente kućnog lijepa. Među pokretnim nalazima obiju faza, najviše je fragmenata keramičkog posuđa (s velikim postotkom ukrašenih ulomaka), slijede koštana i kamena oruđa, dok su alatke od kremena i opsidijana, kao i morske školjke, rijetke.

Primarni predmet proučavanja projekta *Early Farming in Dalmatia* je ekonomija neolitičkog naselja, što zahtijeva interdisciplinarni pristup. Stoga su, uz uobičajene arheološke artefakte, prikupljeni i botanički, zoološki, geološki i malakološki uzorci, a u tijeku su i daljnja istraživanja na području geomorfologije i etnologije. Nakon završene četiri sezone iskopavanja, preostalo vrijeme trajanja projekta predviđeno je za provođenje analiza sakupljenog materijala. Kako je dio uzoraka već analiziran, donosimo preliminarne rezultate.

Dosad obrađeni arheozoološki i arheobotanički uzorci upućuju na situaciju sličnu onoj u Danilu: stanovnici neolitičkog sela u Pokrovniku uzgajali su domesticirane vrste biljaka i životinja, dok su lovne životinje i samoniklo bilje u prehrani bile minimalno zastupljene. No, za razliku od srednjoneolitičkog Danilo Bitinja, ovi se podaci u Pokrovniku odnose i na uzorke iz impresso slojeva. Proistječe da je nova ekonomija na bazi poljodjelstva i stočarstva u sveobuhvatnom, razvijenom obliku doprla u Dalmaciju, vjerojatno zahvaljujući imigraciji, gdje je ubrzo prilagođena lokalnim svojstvima krajolika. Geomorfološka istraživanja šireg prostora uokolo nalazišta trebala bi donijeti saznanja o tome na koji je način krajolik utjecao na ekonomiju i obratno. Nadalje, radi što vjernije rekonstrukcije neolitičkoga gospodarstva, započeli smo sa sustavnim razgovorima s lokalnim stanovništvom, prikupljajući podatke u vezi s tradicionalnom poljodjelskom i stočarskom praksom.

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