Summary

I Introduction

Crno vrilo, the Early Neolithic site near Zadar, is one of the numerous archaeological sites that make Zadar region, Ravni kotari and northern Dalmatia in general, a specific area in archaeological, historical and cultural sense. Discovery of Crno vrilo made this region richer for another archaeological site, and confirmed once more the importance of this region in creating and developing culture and civilization from the earliest prehistoric periods. In the wide scope of archaeological sites, starting from the Paleolithic and Mesolithic ones that have not been excavated, then several excavated Neolithic sites, Bronze Age hill-forts, Liburnian settlements and necropolises, Roman urban agglomerations, early Christian and early Croatian sites, to important centres of Croatian culture, none of these sites cannot and needs not to be given priority according to its importance and meaning, because they are all equally important parts of history and culture of this region, ensuring it a prominent place in wide spatial and historic-cultural relations.

The discovery of Crno vrilo improved our knowledge about the settlement patterns of the Zadar region, and also of the eastern Adriatic area in general, and rich and diverse archaeological finds collected during the excavation contribute significantly to the better understanding of the Neolithic period and the earliest Neolithic culture in the eastern Adriatic. Exceptional symbiosis of the Neolithic populations with the environmental characteristics of their natural surrounding, recognizable in all aspects of life and culture, is one of the most impressive characteristics of this site. Excavation of Crno vrilo improved understanding of all aspects of life in the Early Neolithic in the eastern Adriatic, and also shed light on some previously unknown dimensions of Neolithic life.

Crno vrilo is situated in the region of Ninski Dračevac, about 12 km from Zadar, at the periphery of the helmet Kneževići-Zekići, in an idyllic pastoral environment which offers visual and psychological detachment from everyday urban rhythm, and an opportunity of enjoying nature and experiencing genuine roots of life.

The discovery of Crno vrilo was not a result of systematic field survey, but a consequence of coincidence and amateurish affinities of individuals. In the beginning of 2001, I was given some pottery finds from this site, that were collected by enthusiastic amateurs. The multitude and the diversity of collected finds, as well as good state of pottery preservation and the richness of ornaments, pointed to great archaeological potentials of the site and the need of its excavation. That is why I visited the site and decided to conduct systematic excavation of this exceptional Early Neolithic site.

The first campaign of the excavation was undertaken in 2001, within field practice of the 3rd and 4th year students of archaeology. Although expectations were great, the achieved results exceeded them, which made further excavation of Crno vrilo a scientific obligation. Further excavations lasted from 2002 until 2005 and they were financed by the Ministry of Science and Technology within scientific project «Prehistory of Our Coastal Region». Professors prof. dr. Zdenko Brusić, doc. dr. Željko Miletić and doc. dr. Miroslav Glavičić participated in the excavations during the first year. Mr. sc. Marija Korona and Dario Vujević, assistants at the Department of Archaeology of the University of Zadar, Zoran Bakić, a documentarist, and Ana Marijanović, former student of archaeology on the Department of Archaeology of the University of Zagreb, took part in the remaining campaigns of the excavation. I would like to express my deepest gratitude to all of them for dedicated work which made possible the excavation of Crno vrilo, and writing of this monograph.

1. Roots of life and culture

Crno vrilo is situated at the peripheral, north-western part of Ravni kotari, one of the most exceptional regions of the eastern Adriatic. Low and mildly undulating terrace, with large

flysch zones and narrow limestone ones is bordered by Bukovica on the northern side, and by Biograd-Zadar hinterland on the southern side. It spreads from the river Krka and the Lake Prokljan on south-east and it gradually reaches Bays of Ljubač and Nin, separating it from the island of Pag, so that this part of the eastern Adriatic is the only one with wide coastal zone.

Geological structure of Ravni kotari comprises cretaceous, eocene and flysch deposits, with alluvial deposits at the river mouths, so that sediment rocks - mostly limestone from Mesozoic (Triassic, Jurassic, Cretaceous) period (less from Palaeozoic (Carboniferous, Permian) and Tertiary (Eocene) - are dominant in morphological sense. Soil morphology consists of parallel, elongated, wide folds, stretching in NW-SE direction, following the coastline. Rivers and seasonal streams that run through transversal breaks in the folds and the valleys, together with numerous springs and underground waterfowls, make Ravni kotari the only part of Dalmatia that has abundant water resources.

Communications between the coastal zone and the hinterland are almost restricted by the Dinaric Mountains, which are for the most part parallel with the coastline. Alteration of hills with carst valleys, and asymmetrical mountains with steep south-western slopes further restrict movements from the coastal region to hinterland. Rivers also have limited importance as means of communications because they are short, with strong and irregular flow resulting in cascades. They are navigable only at the mouth, and they have no proper valleys.

Fertile soil is ideal for agriculture, and wide pastures ensure good preconditions for stock raising. This region also offers good conditions for hunting and using sea potentials, so it is not surprising that it had always been attractive as an area convenient for life.

Crno vrilo region, with its elongated, wide folds with rounded outcrops, which alternate with shallow fields in NW – SE direction, presents a miniature picture of Ravni kotari.

It is difficult to determine the time of the first human settlement of this region because the existing data are quite fragmentary. Certain indications point to the end of the Riss/Würm interglaciation, about 65 000 years BC, but it is only the beginning of the Würm glaciation, about 40 000 years BC, that man's presence is attested with certainty. Earliest humans in this region belonged to the Neanderthal species, judging from the finds from other Pleistocene sites with the identical Moustérien culture of the Middle Palaeolithic. The only remnants of this culture are flint artifacts from Ražanac, Radovin, Nin, Zapuntelsko polje on the island of Molat, Panjorovica in Veli Rat and Krševanje polje in Sali on the island of Dugi otok, small island of Stipanac in the Lake Prokljan, Velika pećina in Kličevica, Pećina in Trapljeni doci and Mujina pećina near Trogir.

During the Riss/Würm interglaciation this region's appearance was quite similar to the present-day one, like the rest of the Adriatic area, despite the fact that the sea level was 10 m higher. Such constatation is not valid for the vegetation that is quite difficult to reconstruct owing to the lack of palinological and macroscopic samples. Correlation between cultural and faunal and climatological strata in Crvena stijena point to Mediterranean climate type and termophile vegetation.

By the end of the Riss/Würm interglaciation and the beginning of Würm stadial there was a gradual drop in temperature followed by the decline of sea level, which afterwards advanced rapidly so that in the middle of this period (Würm 3) it declined to 100 m below the present-day sea level. In that phase entire northern Adriatic was land with river running across it, that actually presented a continuation of the river Po, with numerous tributaries. Adriatic islands were also land, and the river Zrmanja was a tributary of Paleopo. The Alps were covered with ice, and glaciers created huge moraines. Strong winds blew tiny particles far away from the originating area, creating thus loess which was preserved on the Istrian coast, the island of Susak and some other islands all the way to Lumbarda on the islands of Korčula and Mljet, but it had also been preserved in the Zadar's surrounding. Polar forest border spread from southern Slovenia over northern Istria, Velebit and coastal zone mountains. Deciduous-evergreen forest with elements of termophile flora was characteristic for the coastal zone of the Adratic sea, and subpolar forest consisting of birch-trees, pines and willows, without termophile species covered so called «Adraitic land». Judging from the finds from the Adriatic region, such biotype was inhabited by following faunal species: elk (*Alces alces*), bison (*Bison priscus*), ibex (*Capra ibex*), Alpine marmot (*Marmota marmota*), rabbit (polar subspecies *Leptus timidus timidus* and Alpine subspecies *Leptus timidus varronis*), steppe pika (*Ochotona pusilla*), common vole (*Microtus arvalis*), wolverine (*Gulo gulo*) etc.

Traces of human activity are recognizable on flint artifacts from Ražanac, Borik, Panjorovica in Veli Rat and Krševanje polje in Sali on the island of Dugi otok, Dražice and Ledenice on the island of Molat, Pećine in Brina (eastern and western) near Drniš, Podumci near Unešić, Okruglo and Glavičice near Sinj and Sumpetar. These finds correspond to other Late Palaeolithic flint artifacts from wider Adriatic region and they show strong relations with

the southernmost Palaeolithic sites of the Adriatic region: Badanj near Stolac and Crvena stijena. This region does not show any artistic creations or great cultural achievements in this period, as opposed to the southern part of the Adriatic. Utter dependence on nature limited energy of spirit and creation, and brought man down to mere physical level. It seems that Palaeolithic inhabitants of this region were orientated only to their survival.

By the end of Pleistocene process of global changes started to happen. The end of Pleistocene and Holocene are characterized by the global warming. Melting of ice and rise of the sea level changed the appearance of the landscape. In the beginning of Holocene sea level was about 30 m below the present-day one. Its rise during Holocene caused the overflowing of the so called «Adriatic land», forming characteristic geomorphological features of the Adriatic coastal zone. These changed circumstances affected cultural development of mankind, not only in the Adraitic area. Unfortunately, Mesolithic is a poorly known prehistoric period. Sites which revealed Mesolithic finds are Vaganačka pećina (with a quite thin Mesolithic stratum), Vlakno cave on the island of Ugljan. Some accidental Mesolithic finds were collected on the islands of Molat and Ugljan, in Borik, Unešić and Sinj. Mesolithic strata of Kopačina cave on the island of Brač and Vela špilja on the island of Korčula were excavated but not published in full extent. Observed in a wider context corresponding strata from Crvena stijena and Odmut should also be taken into consideration. Mentioned finds present the remains of the Mesolithic culture which lasted approximately from 10 000 till 6 000 years BC and they are extremely important because they show that this region was inhabited in the period earlier than Neolithic and that Mesolithic cultures of this region were predecessors of communities whose culture is represented in Crno vrilo and other Neolithic sites. In that sense, origins of life and culture should not be sought out of this region. Questions of relation between Mesolithic and Neolithic as well as of developmental and cultural continuity between these periods are difficult to answer because of the small number of Mesolithic finds and related data.

Our knowledge about characteristics of the transitional period between Mesolithic and Neolithic is still only fragmentary, but nevertheless basic features of this process can be recognized. In Atlantic temperature rises to its Holocene maximum, which coincides with the beginning of the long-term process of transforming previous way of life in the Adriatic region. Transition to the productive economy of the Neolithic type had already taken place in the Near East, Aegean Islands and Thessaly during Aceramic Neolithic. Spreading and accepting new notions from these regions caused changes in previous «hand to mouth» form of economy, including Adriatic region. From the present point of view it is quite certain that foreign communities did not participate directly in this process, but that old Mesolithic populations had a dominant role in this economic transformation. Opposite to the Near East and Aegean region, conditions for these changes were not equally favourable in all parts of the Adriatic region, so that environmental characteristics significantly affected the development of the productive economy. That is why old Mesolithic economy traditions are sometimes more emphasized than the new Neolithic ones, which can cause, in simplified analysis, wrong interpretation of Neolithic communities as Mesolithic ones.

Any attempt of searching for specific regions or centres where this process began would be pointless because the process of neolithization was not dependent only on specific communities and smaller regional units, but it was a universal and global historic process whose beginning and dynamics were determined by general natural circumstances and possibilities, as well as with historic conditions created during the earlier lithic periods of human development. Different regions and communities entered this process at different pace, depending on their adaptability to new circumstances, and on natural potentials and possibilities. Community that inhabited Crno vrilo participated in this process, like some other communities from eastern Adriatic region, establishing gradually productive economy as a dominant way of life. There are different approaches, opinions and models explaining the problem of neolithization of the eastern Adriatic, based on different kinds of data. Some of them are based on theoretical-speculative combinations of different models, neglecting all geographic and environmental characteristics of this region, as well as historic and cultural ones.

2. Setting and origins of life

Crno vrilo is actually a hydronym of local importance used by inhabitants of hamlet Zekići near Ninski Dračevac for one of the springs near their village. This spring is a part of rich underground hydrography of this region, having the greatest importance for the inhabitants of Zekići.

Neolithic settlement was situated above the spring, in its immediate vicinity. Position and surrounding of the settlement suit the needs of a Neolithic community almost ideally

because of rich and diverse economic potentials and general environmental characteristics (fig. 1-4).

The settlement is situated on the southern side of the low limestone ridge, spreading in NE-SW direction. This ridge is several kilometres long and it is surrounded by a large, fertile field, about 15 km long, spreading from NE to SW. Miljašića jaruga meanders through the field, recognizable in the landscape by poplar-trees and reeds.

Neolithic settlement encompassed compact area of approximate size of 100x80 m, spreading in NE-SW direction, which is still clearly visible in its environment. Limestone outcrops, visible at the surface and only partially covered with oak forest, are covered with humus on the area of Neolithic settlement. Cultural layer was hidden beneath humus.

Position of the settlement is not accidental. Crno vrilo spring must have been one of the reasons for founding a settlement on this position, because of its importance as a source of drinking water. Nevertheless, it seems that its role was not crucial, because even if the settlement was situated more to the west or east, spring would be at a convenient distance. This position is exposed to the sun all day long in all seasons and it is sheltered from the winds blowing from Velebit, which were other important reasons for choosing it as a place for living. Also, position of the settlement on the mild slope diminished problems of wet and muddy ground in the settlement during rainy periods.

It is understandable why Neolithic community chose this microlocation. Besides drinking water, sheltered and sunny position, there were also other natural advantages which made this place convenient for life. Agriculture of the Neolithic type developed because of abundant fertile soil, large pastures were suitable for stock raising, vicinity of the sea offered its resources, and food could also be provided by hunting. Such natural conditions could meet the needs of even larger community. Finally, wood in the settlement's surrounding, and stone and clay in the small river were easily accessible material for building solid housing objects.

II Aims, strategy and methods of excavation

Excavation of Crno vrilo implied questions of clear definition of the research aims, and of strategies and methods of excavation. That is why it is necessary to emphasize that in defining these issues I was not led only by strictly archaeological reasons, but I was prone to somewhat different consideration of all aspects of this settlement. Such approach demanded different research strategies and corresponding methods of excavation.

On one hand, research aims were determined by earlier researches of Neolithic of this region, the existing level of knowledge, with all its open questions, and also by the need to introduce more contemporary dimension to archaeological excavations on this kind of archaeological site. Namely, most previous excavations of Neolithic sites in Dalmatia were oriented primarily to stratigraphical, typological and chronological determination of the material; then to some general issues related to economy and the way of life, and only sporadically to sociological and religious aspects of Neolithic communities. Usually only small areas were excavated, or several small trenches were successively excavated, revealing archaeological material, but offering no information about some other important aspects such as houses and other dwelling objects, modes of their building and the organization of the interior, organization of settlement units; dependence of economic activities on environmental and geophysical characteristics of the surrounding, its resources and natural potentials etc. Taking all this into consideration, my primary aim in the excavation of this site was not the Impresso culture in its limited archaeological sense, but I tried to explore the part of that culture understood in its wider sense: as an agglomeration of a certain social community of the Neolithic type, which was closely related to other contemporary social communities with the same forms of social organization, identical economy and economic-social relations, customs and beliefs, use of technologically and typologically identical objects for everyday and special use etc. At the same time, this community remains an independent psycho-social unit with its own organization of economic and social relations which determine all forms of collective mind and understanding. From my first field survey of this site till the end of the excavation I had in mind some very important settlement aspects of this site and quite speculative approach to these questions in previous analyses on some other sites because of complete lack of any information of that kind. That is why the research aims had to be oriented to these questions, i.e. getting to know a Neolithic agglomeration as a clearly defined territorial unit, determining basic principles of its inner organization, understanding relations between the community and the environmental characteristics of the surrounding, defining all kinds and types of economic activities through exact bioarchaeological data, and other question that are usual (in archaeological sense)

on similar excavations. In other words, I was primarily interested in model of a Neolithic site, which will be at least stimulating for similar attempts, if not comparable with adequate contemporary models (as they have not been created in our country).

Such research aims meant that excavation strategy had to be oriented to spatial dimension of the site, so that in the beginning of the excavation area of 200 m^2 was unearthed, and the tendency to open large areas was prevalent till the end of the excavation, giving the total excavated area of 550 m^2.

On the other hand, reasons for such approach are related to the character of the site, its state of preservation and easily predictable characteristics of the cultural layer. Thick cultural deposit and complex stratigraphy were not to be expected on Crno vrilo, on the basis of surface survey, and facts known from other Early Neolithic sites in Dalmatia. In such circumstances, when rich stratigraphy is not expected, orientation to vertical dimension of the site is not justified, but just the opposite – excavation should be oriented to spatial dimension, i.e. its settlement aspects. Basic strategic standpoint in the excavation of this site was its horizontal dimension, and unearthing a large part of settlement was the basic aim of the excavation.

Applied methods of excavation are appropriate to such excavation strategy. They are characterized by simultaneous excavation of several larger areas, offering an opportunity of simultaneous visual perception of archaeological structures on all parts of the excavated area, which facilitated excavation management and its documentation, as well as the analytical-interpretative process.

Excavation began by excavating two blocks («A» and «B»), area of each being 100 m^2, as independent excavation units, connected with quadrant grid, with quadrants measuring 5x5 m. Such approach gives a possibility of connecting detached structures into settlement units, and of predicting possible similar structures in the unexcavated area. Although quadrants made basic excavation units within blocks, there were no control cross-sections along the grid lines, because it was not necessary. Namely, as the site is one-layered, and the stratigraphy is simple, such cross-sections would not contribute to the precision of the excavation, they would serve more as an obstacle. On the other hand, if this excavation strategy is applied, meaning of quadrats as basic excavation units comes down to precision in managing the excavation, to the technical side of the documentation of discovered structures, to defining differences in the dispersion of the finds and their statistical analysis etc. This basic methodological approach was modified only in the sense that excavated areas were getting larger, approaching in this way to the «open area» method. In further excavation campaigns third block («C») was excavated, with the area of 225 m^2, and block A was broadened for another row of quadrants; (fig. 5-5a).

Excavation was based on principles of stratigraphic excavation, which was quite simple, considering the circumstances. Cultural deposit was 0,50 – 0,60 m thick, confirming the starting hypothesis, which was one of the basic arguments for defining the excavation strategies and methods. Main stratigraphic formations on this site are surface humus soil and subhumus layer, then bases of the housing objects and related remains of hearths and ovens, remains of stone constructions, postholes related to vertical constructions and the remains of their foundations, free spaces between the houses which served as communications, and finally original surface, i.e. prehistoric humus and bedrock.

Cultural layer on Crno vrilo starts from the surface, and despite that fact, it is intact because it was not affected by anthropogenic activities and artificial destructions, including land tillage. Entire surface of the prehistoric settlement is covered with grass and low plant cover, and local population have always used it only for pasture. Natural processes, such as erosion, definitely affected cultural layer, spreading it to other areas, so that present surface with the cultural deposit is definitely larger than the original one. This natural destruction, which started while the settlement was still inhabited, did not damage the cultural layer significantly, and it did not change the spatial relations. Considering the entire thickness of the deposit, it is clear that there is no need for its finer stratigraphical division, which means that this site is one-layered with one phase of cultural development. However, the upper part of the cultural layer lost some of its coherence and compactness, so that it seems more like recent humus and subhumus soil. Process of natural destruction of all existing structures and objects started after the settlement had been abandoned, and all anthropogenic activities ceased. The remains of the dilapidated objects started to deposit together with different organic matter, vegetation and faunal remains, changing in that way the structure of the upper part of the deposit. Their further decomposition formed new surface, rich in organic matter, convenient for rapid vegetation growth and the formation of humus layer, resulting in the meadow-like appearance of the surface which preserved the deposits for centuries.

Original surface must have looked somewhat different. Bedrock here comprises thin humus layer formed in the fissures of the limestone rock which for the most part forms the ridge on which the settlement was built. Such circumstances played an important role in the settlement organization and manners of building dwelling objects.

Excavation consisted of precise removals of basic startigraphic units (humus, subhumus, hard packed-earth floors of the houses) or parts of the cultural layer in areas without any constructions with thorough and unselective collecting of all archaeological finds. More delicate excavation procedures such as excavating and cleaning floors of the objects or other areas with some constructions were performed with more precise tools. Excavation of every new excavation unit started with removing humus and subhumus layer, taking into consideration microtopographic characteristics of every excavation unit. All stratigraphic units which could be distinguished according to their colour, consistency and compactness were left *in situ*. Further excavation procedures comprised thorough cleaning of such areas and their connecting into larger spatial wholes which belonged to certain building objects. All formations with larger or smaller rocks were also left *in situ*, and their constructive importance and connections with parts of the objects built with other kinds of material were determined after they had been cleaned; fig 6-14.

One of the aims of the excavation was to determine borders of the settlement, refering only to the area with houses, because it is clear that the settlement in the wider sense encompassed wider area, i.e. entire present-day surface of the site, including the area towards the spring and around it. This attempt was primarily oriented to defining the length of the settlement, as its width is defined by the present-day vegetation, and it is clearly visible on the site. I tried to answer this question by subsurface survey, i.e. by opening several test probes in which I expected nothing more than certain cultural layer which would be firm orientation for estimation of the actual settlement size. Considering the size and spatial relations between blocks B and C, it is certain that these excavation units cover the length of 40 m, to which additional 10 m can be added towards the northern periphery of the site, making the total length of 50 m. As the cultural layer can be traced south of the block B at length of 40 m, entire settlement length is estimated to be about 90-100 m. Neolithic settlement spread on the area of 6750-7500 m^2 as its width was about 75 m. This estimation refers only to the area with dwelling objects. Area between the southern periphery of the settlement and Crno vrilo spring should also be taken into consideration because it is certain that this is where everyday activities of Crno vrilo's inhabitants took place. It is possible that some simple constructions were built in this area. In that case, settlement would cover the area of 10 000-12 000 m^2.

Besides mentioned methods of excavation that are primarily directed to discovering objects and constructions, different other methods of collecting primary and secondary archaeological material were applied during the excavation. Term primary archaeological material refers to pottery finds and all other artifacts, and secondary archaeological material comprises bioarchaeological and other finds important for reconstruction of economy and other activities of the settlement's inhabitants. Primary archaeological material and archaeozoological finds in blocks B and C were collected after thorough examination of the removed spoil. Dry sieving was applied in five excavation units of block A, with a 0,5 cm mesh; fig. 15. Sieving was applied on the area of 125 m^2, which makes 25% of the entire excavated area, giving representative results suitable for making conclusions relevant for the entire site. It is important to mention that statistical data from both sieved and unsieved areas show great correspondence in the structure of finds, and in their relative and absolute relations. All kinds of archaeological material were collected and classified without selection and reduction; fig. 16-17. Flotation was used to collect archaeobotanical finds from blocks A and C, from the area of 255 m^2. Method of systematic sampling was applied in the initial phase, but it was modified into method of aimed sampling after it had been noticed that burnt areas provided samples with positive results.

There were traces of the burnt wood in all excavated blocks, but these remains were preserved in very thin layers, without larger or more compact pieces because of which they were not suitable for radiocarbon analysis. However, this method of determining absolute chronology was applied to osteological finds. This analysis was performed at the Ruđer Bošković Institute in Zagreb.

Dr. sc. Damir Magaš, professor at the Department of Geography of the University of Zadar, analyzed environmental characteristics of Crno vrilo and its surrounding; dr. sc. Maša Surić wrote about the geological features; analyses of archaeozoological material were performed by dr. sc. Vesna Malez from the Institute for the Paleontology and the Geology of the Quarternary Period of the Croatian Academy of Sciences and Arts and Siniša Radović, junior researcher from the same institution. Dr. sc. Drago Marguš from National Park «Krka» made preliminary determination of shells from Crno vrilo, and dr. sc. Snježana Vujčić-Karlo, head

of the Scientific Department of the National Museum in Zadar finished their analysis. Dr. sc. Renata Šoštarić from the Department of Botany of the Faculty of Science, University of Zagreb, analyzed archaeobotanical finds. Dr. Sc. Marta Crnjaković from the Croatian Scientific Museum in Zagreb analyzed petrographical and mineralogical characteristics of the lithic material, and anthropological material was analyzed by dr. sc. Mario Šlaus from the Institute of Archaeology of the Croatian Academy of Sciences and Arts.

As far as primary archaeological material is concerned, technological and typological analysis of lithic finds was performed by mr. sc. Marija Korona, assistant on the Department of Archaeology of the University of Zadar, bone artifacts were analyzed by Dario Vujević, assistant on the Department of Archaeology of the University of Zadar, and Ana Marijanović, archaeologist from Split, wrote about the ornamental system on pottery finds. Besides usual stratigraphical, typological and style analysis, archaeological material was also analyzed statistically.

1. Stratigraphy

Cultural layer on Crno vrilo starts from the present-day surface, it is relatively thin and uneven in different parts, with just one phase of cultural development. Entire deposit can be divided into two main parts: upper, loose part, about 20 cm thick, which seems like recent humus and subhumus, and the lower one which preserved its original characteristics completely, but it is of different thickness in different parts of the site. There are no stratigraphic formations between these two parts which would allow their distinction as separate stratigraphic units. Moreover, the layer is completely compact and coherent, and the comparison of the finds, especially of pottery, from the upper and lower parts of the layer shows complete technological, typological and style correspondence.

Differences in the layer thickness are natural consequence of the spatial development of the Neolithic agglomeration, i.e. of growing of the original settlement, which is connected with the intensity and character of activities on some of its parts.

Observed in different points of «Y» axis of the grid, cultural layer is the thinest in quadrat III of the block C, where original surface is 0,28 m below the present-day one. It is somewhat thicker in the quadrant VI of the same block, where the bedrock was reached at the depth of 0,49 m i.e. 0,51m. Opposite to this, cultural layer is much thicker in the quadrant IX, with the bedrock on the depth of 0,61 m. On the same axis of the grid, in the block B, the layer is more even with values ranging from 0,65 m in the northern part, to 0,40 m in the southern part; fig. 19.

Situation is quite similar with the «X» axis. The layer is the thinnest in quadrants VII and VIII of the block C, ranging from 0,31 m in the westernmost point of the quadrant VII to 0,53 m in the easternmost point of the quadrant VIII. From this point, i.e. in the entire quadrant IX it is 0,55-0,61 m thick.

Values from the block C are similar to those from block A, where the layer is about 0,50 m thick (from 0,52 m in the westernmost point of the quadrant I to 0,48 m in the easternmost point of the quadrant IV), with the exception of the easternmost point of the quadrant IIIC where it comes down to 0,36 m; fig. 18.

Mentioned facts show that the cultural layer is relatively uniform in blocks A and B, and quadrat IX of block C, and it is considerably thinner in quadrants I-VI of block C, and somewhat thinner in quadrants VI and VIII of the same block. As quadrants with the thinnest layer are situated on the almost completely horizontal part of the site, there is no doubt that it is a consequence of the settlement development dynamics. All possible speculations about coincidence or its state of preservation, i.e. later modifications of its thickness by natural processes are out of the question.

Besides these major differences in the stratigraphy of the settlement, there are also some finer distinctions expressed through different stratificational elements. As opposed to extremely thin parts of the layer with no interfacies, in the thicker parts of the layer, stratification is clearly visible, and expressed mainly through successive superposition of floors and elements of interior design; fig. 19. This fact is important for two reasons: firstly, because it confirms mentioned opinion about the reasons for different thickness of the cultural layer in different parts of the site, and secondly, because it showed that there were two settlement phases in the parts where the layer was thicker, which was obvious from the remains of floors in superposition. It is important to emphasize that two or three successive floors cannot be taken as a criterion for stratigraphic division on the entire site. In other words, these examples present individual renewals which have only micro-settlement importance, so that constatation about two settlement phases should be considered in that context.

On the other hand, renewal of the dwelling objects shows that settlement in Crno vrilo did not have temporary character and that certain objects had to be renewed because of its long duration. In my opinion, only the oldest houses had to be renewed which means that parts of the settlement with recognizable renewals belong to its earliest nucleus, i.e. primary settlement built on the smaller area than the one it reached in its later phases. Taking all this into consideration, it is reasonable to conclude that settlement in Crno vrilo lasted for about 100 years, at most.

All mentioned facts support constatation about developmental coherence of the settlement and its determination within only one phase of the Impresso culture.

III Forming space

The settlement of Crno vrilo is situated in the central part of a limestone ridge and it stretches several km northeast-southwest for several kilometres. Land about it is a part of an area which nowadays looks like a regular rectangle of about 150 m length and 80 m width. The terrain is slightly sloping northsouth in a peaceful landscape with no sudden ruptures. Extreme northern and southern parts are almost horizontal, with a gentle, gradual and uniform slope of 10 percent in its central part. Presently the area consisting of a humus deposit shows no rocky parts, and the limestone structure of the ridge, which may be encountered all over the surrounding area, occurs only along the edges of the site, as if it indicates its original form. The modern-day appearance of the site was determined by the activities of its Neolithic inhabitants. Therefore we may say without exaggerating that the nature provided only the land but the man is one that left the lasting imprint on the forms of this microspace.

Namely, the original area looked quite differently and corresponded broadly to the surrounding area. However, as distinct from the environment which has remained almost unchanged, the site of the Neolithic settlement lost its original appearance already during the Neolithic period. Its modern-day appearance has emerged from deposit (fill) formations on the one hand, and defined interventions in the original ridge for levelling and preparation of the areas suitable for building of dwellings, on the other.

On thus prepared surfaces houses were built with well known Neolithic technique. Floors were of beaten earth and covered by planks fixed with daub. Comparable examples of the so far known excavations prove these to be quite new results.

The distribution and organisation of dwellings gives right to this writer to verify that this was a well organised agglomeration where dwellings were not built chaotically, but following a well planned principle of their grouping along the lines of communication.

Such a grouping is best visible in the block B, where the remains of three dwellings were discovered. These dwellings occupied the north south direction by their narrower sides, located just around the two communications running east-west and north-south which intersected at almost a right angle in this block. The extension of north-south communication may be followed in the block C. So it may be assumed that this was one of the main communication lines within the settlement. Having in mind the size of this settlement, it is very likely that there were some other, similar communication lines further north in the settlement. This view, however, has not been confirmed by finds from the excavation site.

With respect to some limitations originating from this, I could not assert with certainty that the layouts of the settlement took the form of quite organised community which would have followed congruous community scheme with quite regularly developed communication lines. However, it seems that the Crno vrilo settlement was characterised by its density and organisation in terms of its inner communication.

Similar communal scheme was found in the block C, in the southern zone of which a rather large part of two dwellings, of which we are quite certain, were excavated. In its northern part the traces of the remains of two more dwellings were discovered. A wider zone with common deposit covered by smaller stones with no traces of any constructions is clearly visible between the dwellings in the southern part. It is very likely that it is a northern part of communication that ran in the block B. Its stretching direction is by no means ideally linear, which is not to be expected, either.

Parts of the floors of at least three dwellings were unearthed in the block A. The way they were separated is not altogether clear. They seem to have been more dense with no marked communication spaces in between. If we assume that this was the space which must have formed the oldest part of the settlement, possible differences between the later settlement organisation are quite understandable, since a small number of dwellings required not much more than a rudimentary planning.

It seems possible that, in the course of later development, the construction of a larger number of dwellings was required by the relatively narrow space for settlement expanding.

On the other hand, such a community organisation shows a clear orientation with respect to the cardinal points of the world. Established communications run approximately in the north-south direction and west-east directions, respectively. The dwellings are, as well, oriented north south. Plan 7-9. Such an orientation is quite understandable since it is most appropriate to the microtopography of the settlement area, which itself is oriented this way. In addition, the orientation of the narrower sides of dwellings towards the north is quite natural due to climatic reasons. The principle of colder side exposure of narrower sides of dwelling objects has been retained ever since.

From what one is able to conclude from the described structures, a large number of discovered material would suggest that eight of them were actually dwellings on Crno vrilo, and minimum that was discovered suggests three more. Their number allows hypothetical speculations about the size of the settlement, or better the total number of dwellings.

Thus, starting from an assumed size of the settlement of up to 7500 sq m, its communal organisation, the number of discovered dwellings and their average size of 30 sq m, and bearing in mind that only parts of structures have been discovered whereas the rest is still unearthed, it may be assumed that during the top population explosion the settlement on Crno vrilo may have included up to 25-30 dwelling of different sizes, provided that the housing density was in all parts approximate to the one in the study area.

I believe that this number is the optimum one with respect to the total settlement area and its microtopographic features on the one hand, and unevenness of its cultural deposit and their shrinkage towards the eastern and western periphery, on the other.

Of course, in its time the settlement did not extend over the total expanse of the area of cultural deposit formation. Even though its extent in the stage of its initial establishment could not be precisely determined, it is quite clear that it was considerably smaller than in its final stage, the size of which may be determined with much more certainty. This is based, primarily, on the differences in the thickness of the cultural deposit which considerably varies between different parts of the study area. While it reaches on the average 0.60 m for the most part of the block A (squares I-II, Ia-IIIa), south-eastern part of the block C (squares VI, VIII and IX), block A and northern parts of the block B (squares I and II), it does not exceed maximum of 0.30 m in any other part of the block C (squares I-V, VII) and block B (squares III-IV). This points to the fact that construction activities lasted shorter and were of more modest extent in these parts. Even though the remains of floors as well as those of the hearths and ovens, were recorded from these parts, as well, which undoubtedly permits the hypothesis of the existence of dwellings there, they can be followed in only the horizontal dimension of the excavated area and not in the vertical one. Therefore it is quite clear that the dwellings existed only in a single dwelling horizon, the youngest one. On the contrary, in the other portions of the area (squares VI, VII and IX in the block C, block A and squares I and II in the block B), the continuation of habitation has been established with certainty for two habitation strata. Therefore, the conclusion that construction activities were rather intensive and long-lasting is not at all questionable. This points to the fact that the development of the settlement may be observed both through its vertical dimension, shown by the continuation of habitation in one part of the settlement, and its horizontal, or spatial dimension, through the extension in the number of dwellings and spreading to the areas which were not covered by construction activities in its initial phases.

It thus seemed undoubtful that the settlement on Crno vrilo occupied about the central part of the area it occupied during the time of the top of its total extent.

Floors of the dwellings were preserved in more compact parts of the larger areas or in traces. They were placed directly on the original ground and bedrock and on the floors of the older dwelling if there was the continuation of habitation. However, special substructions were used in cases when some additional levelling to get more plain areas was required. Materials used for floors correspond to the material most easily found in the nearby environment. Since the settlement surroundings offered not sufficient clay that was used elsewhere on the continent throughout the prehistoric period for these purposes and which, at the same time was the best quality material, the inhabitants of Crno vrilo covered their floors with two different materials: mud from the coomb Miljašiča jaruga as a basic one and clayey prehistoric material from the surroundings as the additional one. In general floors were paid little attention. The floor layers are neither thick nor uniform, but rather rough and coarse due to the origin of the material. They mostly look like stepped mud. Only those parts of the dwellings used for defined domestic activities were built with more care. These are mostly parts directly related to the oven or hearths. There floors are generally thicker and more compact, better flattened and sometimes even baked.

Even though no dwelling has been discovered intact, their size could not be precisely defined. They were rather spacious: more than 4 m wide and up to 7 m long. However, on the basis of the available data and the level of investigations, the writer cannot state with certainty whether they consisted of one or more chambers. However, there is at least a single case that indicates such a possibility.

No interior of the dwelling has been preserved intact. As a result it is difficult to reconstruct the items of their furnishings. It is quite certain that there were hearths (or closed ovens) of annular form, built in the way characteristic for prehistoric periods. The substruction of river cobbles (rarely not present), incorporated in the floor itself was covered with a thinner clay layer which made the basis of the hearth (or oven). Most hearths show several successive coatings which point to temporary reconstructions. All the well preserved hearth remains of this type contained rectangular ash disposal places.

No significant remains have been preserved of the upper construction of the dwellings, apart from clearly visible foundation basis of coarser stone, shallow beds of massive piles supporting the walls, bigger and smaller pieces of daub with the impressions of thinner or thicker branches. Some bigger and more compact pieces of home-made daub show the impressions of rectangular or semi-circular massive parts of the construction.

IV Life in harmony with nature

The Neolithic community of Crno vrilo prospered under superior natural conditions of their surroundings. They also owe the peculiarity of the structure of their economy, clearly reflected by archaeological finds, to such natural conditions. The water was in the middle of established structure, both the one discharged by the spring at the edge of the settlement and that flowing in the vicinity.

Exceptionally favourable ecological conditions both in their intermediate environment and all this area round, made possible the differentiation of activities and consequently rather quality nutrition. Different economic activities, however, were not of equal intensity. To me the unevenness of their intensity point to the balance between natural resources and settlement inhabitants demands. In general, activities of Crno vrilo people were of gathering economy. On the one hand, they obtained from the natural resources of their own area all that they needed, and produced food, on the other, but again in harmony with natural conditions and realities. Crno vrilo community, thus, proves the basic differences between the life of Mesolithic and that of Neolithic people, that is the difference between people which do not leave and do leave „the traces of their identity in the landscape" in terms of both archaeology and culture.

1. Bioarchaeological finds

Everything stated above is not based on assumptions but on rich bioarchaeological data collected during excavations. Archaeo-zoological material was collected by standard methods of archaeological excavations, which are consistent and carried out according to the same principle. Archaeobotanical samples were collected by flotation carried out on a number of surfaces in blocks A and C, that is an area covering 250 sq m, which constitutes almost 44% of the total area studies. Therefore collected data and conclusions driven upon them may be taken as quite reliable and representative of the finding site as a whole.

The quantity of marine fauna collected is quite representative. This was to be expected due to the fact that the site is so close to the sea that it could have been reached with no orientation problems in a single day taking either direction. A single day includes also the time needed for shellfish collection.

The structure and diversity of collected shellfish and marine organisms correlates with their quantity. However, individual ratios of different species are variable, due probably not only to their nutritive value but also to the species composition in Nin Bay at that time. The available finds of *Bivalvia* consists of: *Arca noae*, *Mytilus galloprovincialis*, *Ostrea edulis*, *Pinna nobilis*, *Chlamys* (*Chlamys*) *varia*), *Chlamys* (*Proteopecten*) *glabra*, *Pecten jacobeus*, *Spondylus* (*Spondylus*) *gaederopus*, *Anomia ephippium*, *Acanthocardia* (*Rudicardium*) *tuberculata*, *Cerastoderma glaucum*, (*Venus Venus*) *veruccosa* i *Tapes* (*Ruditapes*) *decussatus*.

Mussel, *Mytilus galloprovincialis* contributed 56% of this structure followed by the oyster *Ostrea edulis* with 37%, which formed a total of 93% of the total number of remains, while the rest of the species made up very low percentages.

Gastropoda: *Patela caerulea, Haliotis tuberculata, Gibbula (Gibbula) magus, Osilinus mutabilis, Cerithium vulgatum, Natica (Naticarius) stercumuscarum, Osilinus turbinatus, Tonna*

galea, Galeodea echinopora, Hexepalex trunculus, Buccinulum corneum and *Pisania striata* showed similar species diversity. Constituting more than 90% winkle (*Osilinus turbinatus*) was far best represented.

Fish bones were represented with rather small numbers, and the finds which could be determined belonged to Osteichthyes of *Sparidae* family, most likely *Dentex vulgaris* i *Sparus auratus* or *Chrysoprys aurata*.

Low number of fish specimens might be indicative of insignificant role of fish in their diet. However, this conclusion should be taken with caution due to possible unfavourable conditions for preservation of fish residues in the cultural deposit of Crno vrilo and even more so since this small number of fish remains is in contradiction with the quantities of shellfish and gastropods. Namely, it would be quite difficult to defend the thesis that the Crno vrilo inhabitants selectively collected only a part of the resources. Therefore the low numbers of fish remains should be primarily understood as the results of poor conditions of natural preservation.

Finally, marine crustaceans are represented by individual specimens. It was rather difficult to determine their species.

Snails count among the gathering crops. They are represented with two species (*Helix cincta* i *Helix seceranda*) whose shells occurred in large quantities in all the deposit parts and all the study area round.

Finally, gathering activities of Crno vrilo inhabitants were proved by, not numerous but attested with certainty, records of tortoiseshells (carapax) of inland turtle species (*Testudinidae*), very likely Greek ČANČARA (*Testudo graeca*).

The records of inland fauna, of mammals in the first place, make up the bulk of bioarchaeological material. Their structure coincides with the structure of older Neolithic finds in Dalmatia which were subjected to specialist analysis. The analysis of zoo archaeological remains of mammals points to the fact that hunting of mammals was of low importance to the economy of Crno vrilo people. Apart from remains of ornithofauna, which was not taken into account, hunting animals make up negligible 1.24% of determinable samples. Calculating the ratio of domestic to wild fauna on the basis of the lowest number of individuals shows slightly different percentages, but do not change much the position of hunting component in the economy of Crno vrilo people. Namely, expressed by these percentages wild fauna constitutes not more than poor 6% of identifiable individuals. The structure of wild animal species complies broadly with their presence in collected material. The following species *Cereus leaches*, *Lupus Europeans*, *Voles* and possibly *Canes spp*. Were present.

On the contrary, the diversity of ornithofauna was much richer: 23 bird species belonging to 18 genera and 13 families were identified. Ten different species of *Antedate* constituted 51%, followed by a considerably lower percentage (13%) of *Otidae*. Other species that occurred, like *Ciconiidae*, *Phasanidae*, *Rallidae*, *Gruidae* and *Corvidae* were uniformly represented with 5%. *Tetraonidae*, *Ardeidae*, *Charadriidae*, *Laridae*, *Strigidae* and *Accipitridae* were moderately present in the collections with 1-3%.

Rich remains of two kinds of archaeological finds shows agriculture as highly ranked form of food production for the people of Crno vrilo. First and foremost, here count the remains of cereals attested by flotation. Even though damaged and in fragments most flotated findings could be roughly determined, (Cerealia), the carbon method analysed samples showed the exact presence of three cereal species: barley (*Hordeum vulgare*) and two species of wheat (*Triticum monococcum* and *Triticum dicoccum*).

In addition, small pulse seed burnt remains (*Fabaceae*) were documented. It is interesting that all the remains were found in a dwelling interior context, mostly close to hearths or ovens and only from areas with the signs of burning. The other group of exact data which may represent the key in understanding the complexity of agriculture and its role in the economy consists of a large number of millstones retrieved from the study area.

Fauna consists of determined domesticated species which make up more than 98% and dominate the total faunal material. Of these the ovicapridae (*Ovis/Capra*) constitute the bulk (95.94%) *Bos* sp. (cow or aurochs) are rather poorly represented not exceeding 2.82% and pigs (*Sus sp.)* with quite negligible *0.10%*. Calculated by the smallest number of individuals, these ratios are negligibly different, (sheep/goat) 88,06%, (cow or aurochs) 5,98%, (pig) 1,49%). However, this difference does not affect our understanding of the structure of domesticated animals. These facts require no special consideration due not only to the strong similarities to material from other Adriatic excavation sites but also due to the fact that the dominance of the so called small cattle agrees broadly with the reports on the animal husbandry development in the Neolithic of the south-eastern Europe**.**

On the other hand, animal husbandry of small cattle is characteristic of the Mediterranean environment, its climatic, pedological and vegetation properties. It also has some advantages over big cattle husbandry.

Dog bones were not identified. Found canines may have belonged to both the dog and the wolf. However, as shown by coprolite analysis the presence of dog in the domesticated animal structure seems to me very likely, as distinct from very unlikely presence of wolf in such a settlement, particularly with respect to the value of animal husbandry which is quite natural.

2. Tools

The above described Neolithic economy is well illustrated by the objects of everyday use. All the tools from this site have certain technical and typological aspects which make them suitable to the needs of the settlement people. Finds occur in large numbers and were recorded from all the parts of the deposit, both inside the dwellings and around them. Different raw materials were used to manufacture stone tools. At Crno vrilo, a great variety of stone types were used, including flint, quartz, bones and horns. Tools are of simple, mainly uniform shape. Many tools retained their typical shape during the whole of the settlement presence without essential changes.

Even though Crno vrilo artefacts include all the types known from other Early Neolithic groups of Dalmatia, and in spite of the fact that absolute quantities of finds were ultimately highest at Crno vrilo, they vary considerably in terms of types and raw materials used for their production.

Massive tools of polished stone are exceptionally rare at this site. This particularly includes axe-heads, of which only two tongue-shaped specimens were recorded from Crno vrilo. Even though massive axes are generally not frequent in the Early Neolithic of this region, one and only specimen seems to be too humble with respect to the number of other finds from Crno vrilo. However, it seems to me that this small number should be understood in the context of a generally law number of massive tools at this site. Namely apart from the mentioned specimen, a total number of massive tools recorded hardly exceeded ten specimens. However, typological and functional aspects of all the Neolithic tools from this site were unprecedented in the Early Neolithic. They were of two types. About ten centimetres long cylinder-shaped artefact, with slightly tapered tip, rounded edges with damages resulting from their usage belongs to the former type. The latter type are cone-shaped artefacts. Only few were found which makes their function hard to identify.

The aggregation of artefacts of polished stone contains a large number of miniature tongue-shaped axes. They are of different size, ranging between the minimum of 2.2 cm length and 1.2 cm width and maximum of 5.8 cm length and 4.6 width.They are of varying types, even though most are flat and more or less of markedly trapezoidal in shape. However, individual specimens are of rectangular or triangular form. Their dorsal surface is slightly or markedly rounded while the blade is straight or rounded, widely tapered, well polished and compared to the blade edges most frequently obliquely cut. Ventral side is most frequently quite smooth. The entire surface of artefacts is well refined and precisely polished, so that flake scars due to chipping are rarely observed and minimum. A total of 32 specimens of such an artefact were recorded, either integral or partly preserved, with a quantity of the waste (debitage) scatters for which it is still hard to say whether they are pieces which are generally not further processed or are the pieces of damaged specimens. However, irrespective of everything mentioned, Crno vrilo contributed a large number of such Neolithic finds in the Adriatic region, since they outnumbered the total number of so far known finds of this kind. Petrography base used for their manufacture is variable but most are not local (Dalmatia). Mineralogical-petrography analyses suggest that such material includes different kinds of serpentinine, diabase, gabbrodiabase, basaltic stone which originated hundreds of kilometres away i.e. in Bosnia. This is of considerable importance since they make possible the observations of economic and cultural relations with contemporary groups out of Dalmatia.

Flint artefacts were abundant, they outnumbered by far the tools of polished stone, as well as flint artefacts recorded from other sites of Early Neolithic in Dalmatia. A total of 4686 flint artefacts were collected from Crno vrilo. Of these 3110 are the waste (debitage), and 1577 tools, which is highly in excess of the number of similar finds from the other sites along the eastern Adriatic. Both the materials found in the immediate vicinity of the settlement and those found kilometres away are almost equally used as raw materials for their manufacture.

This is well evident from the artefacts themselves, since those made of the „home" material are much smaller, most approaching the microlithic size. However those made of the material brought from areas far away from their own area are much longer, reaching over 15 cm. They are generally the largest specimens not only at Crno vrilo or in the Early Neolithic,

but generally in the Neolithic in Dalmatia, as well. It is of particular importance that the total number of exceptionally large specimens is by no means small. This points to the fact that the acquisition of quality material was no problem for the people of the Crno vrilo settlement. In addition, it is important to point out that encrustations were preserved on a considerable number of these specimens, which confirms that raw materials and not the final products were acquired. This means that the artefacts were manufactured in the settlement. The same is also confirmed by a considerable quantity of waste scatters with preserved encrustations including even those which belong to large flint cores. The specimens of completely untreated cores, which are of the size of finished artefacts, are of great importance in this sense.

Even though highly numerous, neither basic types nor the varieties of flint artefacts are characterised by differences in typological aspects. I would say that just the flint artefacts reflect the relationship between economic structure and everyday life.

Two types of technology of flint stone artefact manufacture were applied: knapping (direct and indirect) and pressure chipping. Other techniques were used for finishing tools. Namely the final manufacture consisted of the application of a pressure retouch technique on both faces of tools.

Available material shows that blades of different sizes are numerically the most important group, whereas the quantities of drills, scrapers and geometric-form tools are rather small. Arrowheads are fully absent.

Contrary to typological simplicity, the final manufacture of faces shows a far greater variety likely due to finer functional distinction of individual artefacts and the specialisation of their usage. Namely, the manufacture of the faces of the artefacts ranges from very sharp blades with no retouch to blunt and differently retouched or serrate blades. The specimens with no secondary retouch, the so called usage retouch or the working edge with clear use signs are shown by a narrow shining track along the edges.

The group of artefacts known as blades are numerically the most important group. Their sizes vary from markedly short specimens, of narrow body to markedly long and massive specimens. They are usually of a regular shape, with parallel side edges and dorsal scars, triangular or trapezoidal cross-sections.

Blades are differently processed, and the quantity of not retouched blades is approximately the same as that of retouched. In the specimens with no retouch the so called usage retouch and some other usage signs are clearly visible. Apart from bifacial blade specimens, there occur the unifacial ones and those with blunt or evenly cut edge. Frequently, the encrustations of cores, the exceptionally long and massive blades have been knapped off, had been preserved particularly on their dorsal surfaces. In addition to specimens with lateral retouch, those with proximal and distal ones are also represented. The retouch is straight, reverse, alternative or bilateral.

Specimens with serrate blades which do not belong to the so called usage retouch but are the consequence of in advance planned usage and purpose are exceptionally numerous. Sometimes they are so minutely denticulated, and very uniform all along their length which shows highly developed skills and experience. On the other hand, artefacts of this type show that their specialisation and usage were planned since undoubtedly they were made to be used as sawing tools.

At the same time, the specimens of chisel-like tools with a single or two bigger or smaller notches are also frequent. They could have been used to process bones or stones.

Drills as special tools are not frequent. They were processed with high retouch all along their working length. Apart from being used as independent tools they occur in combination with small-size blades.

It is quite odd that arrowheads were fully absent from Crno vrilo. Even though this type of tools is not numerous on other sites of the Early Neolithic in Dalmatia, this is not in harmony with the reports from other settlements. Their absence may be accounted for in only one way. This hunting technique had no value for the inhabitants of Crno vrilo, which means: **first**, that hunting generally had limited value obvious from the presence of bones of wild animals; **second**, that in the extent to which it was practiced it was limited to a defined hunting animal group, shown also by the structure of the fauna; and **third**, that the inhabitants had developed some other hunting techniques. One of these techniques might have been the traps which would have been placed close to the springs or the ravine Miljašića jaruga, to entrap small animals. The other hunting technique which could have replaced arrows were throwing weapons. Even though this group of finds belong to lithic artefacts, which I reported in the previous part, I mention them here as another peculiarity of Crno vrilo and adaptation to life circumstances. Missiles are of different size, made of sandstone or cobbles, and the delicacy of their processing depends on the material used. Missiles were made of sandstone and had an almost ideal spherical shape, while the specimens

made of cobbles were more irregular, with visible removals of natural deformities. Apart from catapulted missiles, the presence of missiles thrown by slightly different techniques is very likely. Namely, on a partly damaged missile of spherical shape we found a rather deep groove used very likely to wrap leather straps. Even though it belongs to throwing weapons, the technique of its throwing is slightly different, and I would say, easier and simpler.

In addition to these artefacts, uncommon among the finds from other sites of the Early Neolithic, a large number of artefacts of rather regular parallelepiped shape, made most frequently of fine and rarely of coarse sandstone, was also recorded from Crno vrilo. Due to their small size, as well as to rather regular shape and worn areas, or usages signs all over the faces, their purpose could not be related to millstones or any other tools for wheat grinding. It seems quite reasonable to identify them as specialised tools for leather processing. With respect to a large quantity of leather obtained due to abundant use of meat in nutrition, the manufacture of specialised tools is quite understandable.

Artefacts made of bones make up a separate group of finds at Crno vrilo. They occurred in large numbers in all deposit parts, both inside the dwellings and around them. A total of 374 such tools were found. So far, the bone artefacts from Crno vrilo are considerably in excess of all the Early Neolithic bone tools recorded anywhere in Dalmatia so far.

Above described bone artefacts indicate that all the aspects of the real life of population from this site were in extraordinary harmony with the economic resources of their immediate environment. Namely the animal husbandry component in the economy of this community is not of importance for food supply only, but as well in all the other aspects of use of domesticated animals. The Crno vrilo community had available an abundant source of bone raw material for the manufacture of all the necessary tools, so that its members did not have to be particularly concerned with resource maintenance.

The available assemblage is absolutely dominated by tools intended for piercing. Their more refined functional distinction may be done on the basis of their size, delicacy of their processing and proportionality between the artefact corpus and the size of the surface to be processed. The other kinds of bone artefacts – swages, spatulas, hafts etc. are far less numerous.

Long bones (radia and tibia) and smaller tubular ones (ulna, metacarpal and metatarsal bones) of domesticated animals were used for manufacturing various artefacts. In spite of evident differences in the delicacy of the processing of individual artefacts, only two procedures in the technology of their manufacture may be distinguished: primary i.e. preliminary one limited to rough treatment and final shaping when the tools are finished and adapted to their purpose.

Dependently on the size and purpose of artefacts, techniques of knapping, straight cutting, bifacial or unifacial oblique cutting and grooving, bones breaking along the longitudinal axis, careful flaking all along their length or removal of one or both epiphyses were applied.

In the final stage of procedure, that is cutting, scraping, polishing and hole drilling on obtained rough forms only the tip had been refined, that is the narrowest working surface. Some artefacts had been processed all along their length. Even though final stage of processing of bone artefacts is quite clear, having been documented by the records of tools used for their processing from a number of prehistoric sites, and the Neolithic sites, as well, I should mention that amorphous pieces of finer sandstone were also recorded from Crno vrilo. They contained grooves resulting from polishing and edging of bone artefacts in the course of the refining of the primary form obtained by knapping and cutting.

The size of artefacts and the level of their finishing determine their function. Thus, massive specimens made from bigger bones, broken lengthwise, with their narrowest working surfaces only being refined, are very likely the drills used for piercing thick and tight leather. Smaller specimens well refined throughout their length were intended for sewing or piercing of thinner materials. Among the breakthrough tools at Crno vrilo the massive borers, needles and awls may be distinguished.

Polishing tools were not so abundant. However, they belong to the category of fine bone artefacts. Typologically, they have certain typological aspects in common. They were made of tubular bones with one joint fully preserved and the other obliquely cut with a corpus partly preserved so as to get fan-like blank suitable for polishing. Apart from these, exceptionally rare are polishing tools made of a part of longitudinally fully split off bones and those of bigger ribs.

As to the number of specimens recorded from collected material, spatulae are also exceptionally rare. They were made of large, longitudinally split off bones, the bone mass of which was rather thinned and well polished at the part of the haft. The other end was slightly distended forming a spoon of irregular ellipsoidal shape. Such distension defines this tool functionally.

Other artefact types were recorded only as single specimens. So they can be classified as a unique coherent group. Here primarily counts a single specimen of fishing gear. It is a hook (angle) intended for fishing for larger fish. Since the hook is fully preserved, it is obvious that its tip ending was not a tooth, and that it had a marked eye for easier yarn fitting. The form and function of some finds of which only fragments were found were hard to be explained, so I am not going the speculate about their purpose. Unfinished or partly finished objects count also among the bone artefact whose assumed purpose is hard to be even hypothetically determined.

Even though not bone artefacts, I would like to mention a number of stone objects which well document the process of bone artefact finishing.

These are amorphous, bigger or smaller pieces of sandstone or limestone with well visible worn area grooves resulting from their use in polishing roughly made bone artefacts. These grooves are rather deep on individual specimens pointing to the intensity of their use.

Finally, another type of tools which may not be defined as artefacts make a special group. These finds show no signs of processing or preparation for use, but there is no doubt that they were used in a defined process or in at least a part of it. Here count long tubular bones, simple food wastes whose joints show mechanical deterioration. In spite of missing of even elementary processing, it is quite clear that a part of them was used as tools. With respect to the morphological properties of that part of bones, and the kind and level of their weariness, they were very suitable for scraping and it is obvious that these joint parts were used for scraping some materials.

I believe that it should have been some soft material, very likely leather, which means that they were used instead of scrapers just before finishing to scrape off fats and other impurities.

3. Adornment

Compared to other kinds of records, the specimens of body ornamentation adornment are not numerous but diverse enough to distinguish different groups in terms of the material they were made of. On the other hand, with respect to other sites of the Early Neolithic where ornamentation finds are very rare, Crno vrilo occupies very high position. Archaeological site of Crno vrilo yield pendants drilled in shells, stones, bones and animal teeth.

Pendants were mostly made of: *Acanthocardia* (*Rudicardium*) *tuberculata*, *Cerastoderma glaucum* i *Venus* (*Venus*) *veruccosa*. A total of 39 specimens of different size were recorded. The technology of their processing is simple and standardised. The bulb of all the specimens was first delicately faceted and then the surface pierced using a drill. Marine gastropods *Patela caerulea* and *Pisania striata* should be added to marine fauna used as raw material for the group of adornment pieces.

The other group of pendants were sometimes manufactured out of the small stones of different colours collected from the nearby ravine Miljašića jaruga. Predominantly ovoid in shape, only sometimes irregular, they are mainly flat and rather thin. Their surface was mostly untreated but very smooth. Only the hole was drilled which allowed them to be strung and worn around the neck. The total number of finds is very small - only four.

Pendants made of bones occur only as individual specimens of miniature beads of seed shape, shorter or longer phials or rounded platelets.

On the contrary, animal teeth used as jewellery are very rare. A single tooth, very likely wolf's (*Canis sp.)*, with pierced root area was found.

V Craft of pottery

Apart from the lithics and bone industry ceramic manufacture was also exceptionally rich at Crno vrilo. This is one of the things that makes me believe that no related site of Early Neolithic in the eastern Adriatic area can compare to Crno vrilo pottery, first by its number and then by its typological variability. Even though by its shapes the total fund of ceramics fits well into the well known standards of the Impresso culture. Due to the variety of forms and the number of specimens of each, it seems that the potters from Crno vrilo, inheriting all the experience and tradition of ceramic industry from the related sites of this culture, had developed the Early Neolithic ceramic production to the extent that some typological characteristics announce some traits of the later stages of Neolithic from this area.

Pottery is mostly made of earth which was either semi purified or not purified at all, its natural context consisting of ingredients among which the amorphous beads of limestone dominated. Even though the granulation ranges from negligibly small beads to rather

coarse ones, the facture was generally not rough. In addition, the quality of the surface is independent of either the quantity or the granulation of ingredients. Even though coarser limestone or other stone type beads occur at the outer walls of a large number fragments, it is neither rough nor rugged, and all the wrinkles were removed with at least minimum polishing. Of course, the delicacy of processing of the walls of pots from the funds may be described by a whole scale of appearances, starting from the specimens on which no other signs of processing are visible apart from primary alignment of the surface, through these which clearly show the signs of abrasive agent, to those the surface of which had been burnished. However, I will not take the path of ordinary classification schemes that is the separation into rough and fine ceramics; I will do this by distinguishing two completely different ceramic types. The former is the ware with decoration i.e. Impresso ceramics in the narrower sense, and the latter ceramics with no decoration, which I will provisionally call monochrome ceramics. Both ceramic types occur simultaneously in all the parts of deposit and on all study areas. This coincidence in time is one of very important characteristics of Crno vrilo.

After the statistical sample from the quadrant I Block B, with a total of 4361 fragments, painted ceramics makes up 65% of the assemblage in relation to 35% of the plain one. In the quadrant I of Block A, taken as a second statistical sample with a total of 4905 fragments this ratio is 61% to 39% again in favour of decorated ceramics. Finally, in quadrant IX of the Block C, which is the third statistical sample, decorated ceramic makes up 57% of all the samples. Thus obtained ratios may be as a whole applied to the rest of study surfaces, that is the study site as a whole wherefrom a total of 120 000 ceramic fragments were collected.

In addition to the fact that one of two groups contains decorated pottery and the other the monochrome one, there are also some other features by which these two ceramic categories are distinguished.

The first refers to the surface colour which in plain ceramics often has dark paint. These are usually fine nuances of dark greyish to almost black colour. However, there are also specimens with no decoration varying from light to dark brownish. In decorated ceramics there is variability in colours and nuances, from purplish red to tan red, pale and dark brown with a series of brownish nuances, reddish-brown, different grey nuances to black etc. Walls of individual vessel parts are markedly different and contrasted. Most frequently these are dark greyish, almost black colours, but as well the vessels with no decoration and pale brown and darker brownish nuances.

Greater importance was usually given to the processing of vessels with no decoration. This is quite understandable in terms of the finer the surface of vessel wall the closer it is aesthetically to the decorated one.

Apart from technical-technological differences, these two groups of ceramic ware may be typologically distinguished on the basis of a variety of forms. Basically, these differences are expressed by the number of recorded vessel forms, that is their types and varieties. Even though decorated ceramics is not totally simple and stereotypical in form, the number of its basic forms and varieties is generally smaller than those of plain ceramics. In this respect it may be stated that plain ceramics is typologically more diversified. On the other hand, defined differences are present in quantitative relations of the presence of individual types.

1. Forms

The group of decorated ceramics is dominated by bigger vessels, of closed egg like and spherical, semi-spherical or calotte-shaped forms. However, smaller vessels are by no means insignificant group with a small number of specimens. Their forms coincide with the above mentioned ones. In this sense, the greatest difference occurs in the ratios between the height and diameter of vessels. These ratios also define them functionally. So, pots, bowls and small dishes, plates and cups may be distinguished within the group of decorated ceramics.

Dishes which may be determined as pots are divisible into the following types:

- deep-bodied pots with evenly rounded walls from base to mouth;
- deep- bulging-bodied pots of egg-like form with markedly small mouth
- deep-bulging-bodied pots of pear-like form and fully narrowed mouth;

The category of bowls is represented by:

- deep closed bowls of elongated bodies, similar to the basic pot types, with the walls evenly rounded from base to mouth;
- deep closed bowls of spherical form;
- deep closed bowls with marked bulge and markedly reduced mouth;

- deep, softly moulded semi-spherical bowls with wide mouth and slightly inverted rims;
- biconical bowls with rolled in mouth;

In the group of plates, whose basic typological characteristic is deeper or shallower calotte-shaped form with rounded or reduced base and wide mouth, all typological varieties are determined by the ratio of height to diameter. So this type of vessels ranges from very deep ones, similar to bowls on a short legs to markedly shallow forms of round base similar to plates; Typological table I, 14-15.

Even though the quantities of plain ceramic category, or ceramics with no decoration, are slightly smaller, the number of the varieties of its basic forms is considerably higher. This is the first essential difference in basic typological properties between plain and decorated ceramics. The other important difference is the fact that the group of plain ceramics is dominated by the vessels of medium and smaller size, while the big ones are almost completely absent. And finally, the third important property of plain ceramics which distinguishes it from the decorated one is the dominance of open over closed vessels. Of course, this does not mean that basic typological determiners of Impresso culture – egg-like, egg-like-spherical, semi-spherical or calotte-shaped forms – are insignificant feature.

The basic types of closed egg-like, egg-like-spherical and semi-spherical forms of plain ceramics correspond to relative types of decorated ceramics. However, vessel specimens of plain ceramics the size of which could be compared to most related pot types are very rare.

Contrary to the small number of vessels of larger size, bowls are present in far larger number of specimens and varieties:

- shallow calotte-shaped bowls with reduced mouth;
- deep bodied more or less bulging bowls with markedly reduced mouth;
- deep spherical bowls with short incurved neck;
- semi-spherical bowls with short slightly inverted neck;
- deep semi-spherical bowls with tall vertical neck;
- shallow biconical bowls with slightly incurved upper cone;
- deep biconical bowls with slightly incurved upper cone;
- calotte-shaped bowls with short legs, flat or round base;
- Small-size bowls which may be determined as cups are present in biconical shapes rimless or with slightly pronounced rim.

Bases of the vessels are shaped in different ways. Irrespective of whether they belong to the plain or decorated ceramics, they have round, flat, thick or ring bases. These are only the basic forms of which most, and particularly the flat, thick and ring bases, vary due to the size and type of vessels. Not all base types occur equally frequently, nor all their forms are present on all types of ceramic ware. However, their exact relations and primary relationship to a defined vessel type is impossible to establish.

Ears (Handles) are present in large numbers, but their numbers are not accompanied by any significant typological diversity, since the broadest variations are related to ear size which is primarily dependent on vessel size. Handles are most frequently rather wide, vertically placed strap handles rectangular and rarely oval in section.

Strap handles are mainly attached to the medium parts of the vessels. This was done in two different ways which essentially affect their form: moulded clay mass applied to vessel walls forming the ear, with a hole to create the earhole sometimes including the surface wall of the vessel or from longer or shorter clay straps whose ends are simply pasted to the vessel wall with no later holes drilled.

Apart from vertically placed strap handless recorded from Crno vrilo pottery, specimens of horizontally placed ones were also documented. However, as shown by the available material and level of preservation, their number of specimens is smaller. Apart from the ordinary position of handles at the upper part of the belly or on shoulders, those with handles placed at the very bottom were also found.

Undoubtedly, the fragment of a pintadera is one of the most beautiful specimens from Crno vrilo, which at the same time represents quite a new phenomenon in the Early Neolithic. Even though damaged, preserved fragment shows that it was certainly rectangular in shape. Its handle is also damaged, with only a part of the root visible with preserved shallow groove of the transversal earhole. In spite of being fragmentary and damaged the decoration made on flattened ventral surface is particularly impressive. The delicacy with which it was made, complexity and harmony of composition, as well as technical perfection and precision relate to the large number of examples in the system of decoration of ceramic ware at Crno vrilo.

However, the techniques of decoration, and the motives of plastic zigzag patterns, are quite different from those on ceramics. Namely, full plasticity was obtained combining two techniques: impression and incision by which the decoration was made in two successive

steps: the horizontal and oblique series of oppositely oriented triangles were made by the first procedure - impression and the unnecessary areas between the series of triangles were performed by incision . Thus the full plasticity of the pattern was obtained.

2. Ornamental system – on the threshold of art

Pottery production of the Crno vrilo community owes its exceptional features to its ornamental system, that is to say all the elements which determine the special properties of culturological environment and identity of psychosocial milieu. This community is identified by its creativity and inventiveness: a variety of decorative techniques, delicacy of performance, variety of motives, sophisticated organisation and composition of decorative elements, showing tendency to spread the decoration all over the vessel surface and finally general level of its artistic achievements. Therefore, it may be stated with certainty that the Crno vrilo pottery considerably exceeds all the phenomena of the system of decoration of Impresso culture recorded so far from the eastern Adriatic region. It also contributes a lot to the image of decorative abilities of its people. Such diversely and highly ornamented pottery allows no classification common to such reviews, since almost each individual decorative pattern, even when it looks the same as another, demands a special classification criterion. Therefore, each ceramic fragment appears, and it in reality is, not repeatable creative act of an individual. Such individual creativity may be classified by a single criterion: decorative techniques based on the type of tool used to create individual kinds and types of decoration.

With respect to everything said above the decoration techniques of the Crno vrilo pottery may be roughly separated into the following groups: **1)** finger tips or fingernails are simply pressed into the clay; or the clay is nipped; **2)** incision and similar techniques; **3)** stabbing or pressing decoration with miniature implements, original or purposely made which create a wealth of differing impressions (irregular, oval or circular, triangular, rectangular; **4)** impression, or pressing bigger, purposely made implements; **5)** plain or ribbed edges of shells pressed into the clay; and **6)** other techniques. Even though the entirety of decorative system is determined equally by all decoration types, it should be pointed out that the frequency of occurrence of individual techniques differs considerably. The decorations with plain or ribbed edges of shells and those by stabbing or pressing decoration miniature implements, original or purposely made to create a wealth of differing impressions (irregular, oval or circular, triangular, rectangular) are much more frequent. Decorations thus may have been used to indicate things such as identity of creative expression. However, these two techniques are not equally represented, either, since the sample taken from the quadrant IX in the block C showed the ratio of 1:9 in favour of decorations made by shell impressions. Since this relationship was based on a total of 4770 fragments, and simple visual inspection of finds from this quadrant and the other ones from the same and other blocks has given the same impression, mentioned statistical sample may be taken as representative of the general relationship between decorative techniques at Crno vrilo.

Varieties within these two techniques are so numerous that no classification is possible. This is quite understandable having in mind that pottery decoration is a creative act which, to tell the truth, works on the basic principles complying with the state of mind, technical achievements and possibilities, aesthetic and artistic taste of the social environment. However it does not define the limits and establish rules which may be overcome to express one's own affinities for variations of the known horizons and searching for the new ones. Ceramics as a medium offered the entire spectrum of such possibilities.

VI Secret of the world of the dead and the world of «magic»

Crno vrilo practice of burying the dead is not known. There is the same uncertainty as to how and where Neolithic people from Dalmatia, eastern Adriatic area and its hinterland, buried their dead in spite of the records of buried people from some sites. However none of the small number of buried individuals, found mainly within the confines of the settlement, may be taken as illustrative of the general and collective relationship to the dead, or the idea which defines the death or the relationship of the world of the live to that of the dead.

This remained the same during the whole of the Neolithic. The cemeteries were rarely or not at all encountered, the dead were buried individually within the settlement. The small number of burials and departure from the typical sex and age structure, no traces of burial rites, and no grave goods which would tell us about the age, sex, social rank, or personal interests of deceased individuals, seem to be that what we can learn about the burials.

There is an individual burial from Crno vrilo. Namely, during the excavations in 2002 the remains of a single human buried in the part of the settlement marked as block D was discovered. It was not found as a result of an in advance assumed possibility, but due to the pure chance and the way the burial was performed. Namely, the remains of the bones were found in the cultural deposit not more than 10 cm beneath the modern-age surface, to be more precise beneath the humus and sub humus part of the deposit.

The fact that the bones were discovered just beneath the modern surface, clearly stratify and in the relative chronological terms relate it to the very end of the settlement at Crno vrilo.

The direction of the grave was obviously north-south slightly deviating in the north-east and south-west directions, the head of the deceased pointing in southward direction, laid on a left side so that the face faces west. Left leg was markedly bent towards the chest, while the right leg was in a much more relaxed position, with the aitch bone almost perpendicular to the body. The arms are bent and placed towards the face. The skeleton was not accompanied by any grave goods. Since the grave was very close to the primary surface layers or nowadays subsurface, the bones are slightly fragile. The deceased was a female of about 30-40 years of age. All the teeth have been preserved, and the level of tooth decay is not high, due to the relatively low age. General habitus of the dead show that the woman was not of a big stature. On the contrary, her thin bones show rather gentle stature so that she likely belonged to the Mediterranean anthropologic type. This is in compliance with the related records from the Adriatic region. The deceased woman was not inhumated but laid on the surface. This fact confirms the coincidence of the time of burial and discontinuation of the settlement at Crno vrilo. Even though the body was not laid in the grave, it was not simply left there without protection, a kind of construction and a defined rite. Namely, the body was undoubtedly covered by bigger stones, at least partly. This was evidenced by few bigger stone pieces lying around her feet. The stones were simply thrown on the body. Therefore there were recorded several „old" fractures on the tibia, due likely to the weight of the stones. Due to the same fact the bones of the right leg appear unnatural, as if being in a secondary position. This raises the possibility that the body was fully enclosed by stones. This is particularly evidenced by the stones behind her back and along the lower part of the skeleton where large stones were found. No such large stones were found at the front side and around the head, where smaller stone heap is clearly visible.

Spatially, the grave is in the north-western part of the settlement, closer to its limits than to its centre. This leads to the question what is its relation to any of the settlement objects, that is whether the dead individual was buried inside the house? It could not be considered certain but I believe that the woman was buried inside. Namely, both in this quadrant and the adjacent ones (I, V and VII) there are the remains of the floor, which had been poorly preserved due to their being too close to the modern age surface and more exposed to deterioration. That is why all those remains could not be related so as to get an image of the formation of the entirety, and therefore it is impossible to establish the relation of the tomb to the dwellings. Yet, based on the communal scheme and settlement disposition, it is still possible to classify the floor remains structurally into large surface structures in an ideal reconstruction of studied part of the settlement. In this respect I may say that it must be considered certain that the deceased was buried within a house.

Even though having no relation at all with this grave, I will here report on a small aggregation of finds which illustrate some other aspects of spirituality and religious structure of the Crno vrilo community.

In spite of the fact that this aggregation consists of a small number of specimens, it is not homogeneous so that two components may be distinguished. The first includes three characteristic finds which Croatian archaeological literature calls „flutes". They are all made from deer bones with several roughly pierced holes on a part of the corpus. Apart from pierced holes there are no other interventions or shaping traces. The same group includes several long tubular bones with some perforations bellow the epiphysis, with no traces of shaping, either.

The above mentioned specimens I would classify as illustrative of religious practices of the Crno vrilo community, directly related to their economy. It seems to me that the formation and structure of religious concept, and therefore formation of collective mind of Crno vrilo community, was essentially affected by the structure of their economy, the one shown by secondary archaeological material.

Exceptionally favourable ecological conditions, their full harmony with the surroundings and pronounced adjustment of economic branches to the natural resources provided calm and stable life circumstances to the community of Crno vrilo. What must be considered certain is the fact that the settlers of Crno vrilo did not view the stability of their existence rationalizing the reality because it was quite strange to their collective mind. Instead, they interpreted it in compliance with their ideological and religious concepts.

The Neolithic people harboured religious beliefs centred around a fertility cult, and its different manifestations reflect only the differences in seeking defined fertility forms.

Namely, even though this cult was primarily oriented towards the community, its biological sustenance and general supports of human societies, a variety of ideas related to different fertility aspects in the nature make an integral part of such a religious concept, particularly those ensuring the abundance and continuity of life. Economy thus was perceived as an essential factor of religious thought formation and of structuring religious concept as a whole.

The fact is that no construction of community ritual centres, no entirety to which any cult character could be assigned and no artefact found in context which could give it the least cult sense were discovered at Crno vrilo. However, it seems to me that to discuss the existence of fertility cult, particularly of such an aspect does not require having easily recognizable manifestations available. Namely, it does not necessarily imply the worship of a clearly defined image, but rather a vague idea of harnessed supernatural forces for the benefit of the group. In such a perception most of the cult might have been of magic character and based on some rites, which could have made use of any means appropriate for ritual purposes. The usage of bone artefacts such as „flutes" , pierced animal bones etc., could have been quite suitable for the magic acts performed by an „instructed" member of the Crno vrilo community. In this sense the finds we have mentioned in this chapter could be an illustration of the cult. They are not the symbols but ritual means.

The other part of the aggregation refers to a single find. However, its value and importance are exceptional due to the fact that it was recorded from this site, that is in a temporal and cultural context in which such finds had been completely unknown.

Only a portion had remained of this specimen. It is a part of recipient with a strap handle semi-circular in section. However, even though incomplete, its typological properties are quite obvious. Receptacle with an oval mouth is laid obliquely, almost horizontal, with a ring fixed perpendicular to the back of its upper part. Thus, in spite of the lack of some other parts, particularly legs, there is no question that this is a well known four legged rhyton. As distinct from the receptacle which was not decorated as shown by the preserved parts, the handle is richly ornamented with ribbed edges of shells.

It is now more than half a century since the first rhyton was found, and all the finds correspond fairly closely with the Middle Neolithic, that is Danilo, and later on Hvar culture. On the other hand, it is well known that they comprised much wider cultural complex than these two. In this respect there are two issue of importance: originality and origins on the one hand, and character and functionality of four-legged rhyta, on the other.

The interpretation of the issue of the origin of four-legged rhyton from Crno vrilo may be less speculative than earlier. Namely, since the chronological correspondence is here of greatest importance, it is quite clear that this record has been so far the oldest known rhyton, which defines the eastern Adriatic, and Dalmatia in the first place, as the cultural complex to which four-legged rhyta are primarily linked.

As to their functionality I would state that this type of cultural instruments had the same meaning for the Neolithic community of the Adriatic region as anthropomorphic plastics had for contemporary Neolithic communities.

VII Contemporaries

Crno vrilo is not the site which corresponds to the very beginning of the eastern Adriatic Early Neolithic cultural horizon. This is best illustrated by well organised settled villages, with no longer underground dwellings. The settlement was established in an environment in harmony with the demands of the Neolithic way of life, fully stabilised productive economy, with cattle breeding and agriculture as the basis of economy, new labour tools, optimum exploitation of other natural resources (ornithofauna, marine resources), material culture representative of the culture of Early Neolithic all over the territory of the eastern Adriatic, spiritual culture phenomena which did not differ much from the same characteristic phenomena throughout the Neolithic, etc. In other words, Crno vrilo is not the example of a settlement where the forms of new economy started to spread. On the contrary, it is the example of a typical Neolithic settlement which had already mastered the skills to their full extent.

All these facts point clearly that Crno vrilo is a community which had come far from the initial and reached the stage of the development of the Early Neolithic which would provide the basis for the continuation of this community in the Middle Neolithic. This defines its relative chronological position in the Early Neolithic of the eastern Adriatic.

Apart from these general issues, the relative chronological position of Crno vrilo in the context of the eastern Adriatic Early Neolithic may be established by some other essentially

important elements taken into account when solving such problems. Here count: technologically-typological properties of stone artefacts and style-typological properties of the pottery, connection with the other Early Neolithic sites in analogous shapes, and dates obtained by radiocarbon analyses.

As clearly shown in the previous chapters, Crno vrilo is characterised by an exceptionally abundant production of artefacts of knapped stone. Collected finds heavily outnumbered the same finds from all well known Early Neolithic sites of the eastern Adriatic. Thus, this site occupies an outstanding position among the sites of this area in this stage of Neolithic. It is , therefore, quite clear that the comparison of lithics of Crno vrilo with any other Early Neolithic site will be quite pointless.

On the other hand, in spite of their large numbers, the flapped stone artefacts are not characterised by typological diversity of either the basic types or their varieties. However, this fact does not mean that lithic production of Crno vrilo community was poor and underdeveloped since typological standardisation and high quality manufacture are its most important properties. This is best evident by the fact that the largest number of finds were tools named blades. In this context it is of significance that these tools were always very regularly shaped, irrespective of their size which ranged from markedly short to markedly long and massive ones. The regularity means parallel cutting edges and dorsal ridges. At the same time it is important that the processing of working surface of artefacts differs and was performed by a variety of technological procedures, ranging from not retouched but very sharp edges, through blunt to a variety of retouched or serrate ones.

Everything mentioned above points to the fact that lithic production of Crno vrilo was the result of a long-term technological and functional adaptations to that what the community needed. This implies that both in the typological sense and technology it got far from Mesolithic tradition evident at some other Early Neolithic sites. On the other hand, in its entirety and in individual specimens, the Crno vrilo connection with the Danilo culture is mainly with analogous technological-typological properties of knapped stone artefacts. So for example, all the bigger blades associate Crno vrilo with the Danilo specimens of Smilčić and Danilo itself. Danilo artefacts of this type are characterised by almost identical technical-typological procedures not of their primary production but of additional processing of blades including retouch, as well. On the other hand, such specimens are exceptionally rare or not at all represented on other Early Neolithic sites. Large number of flapped stone artefacts on Crno vrilo is also very indicative of the fact that the Crno vrilo settlement should belong to the very end of the Early Neolithic.

Typology of ceramic finds is indicative in the same way. A part of these finds obviously belonged to the standard typological repertoire of Impresso culture with closed spherical or semi-spherical forms as their basic typological property. This is also basic typological feature of the pottery of the Early Neolithic as a whole, irrespective of whether they correspond with some narrower time periods within Early Neolithic or with cultural and spatial relations. Accordingly, this part of pottery forms corresponds fully with the time position the Crno vrilo site occupies in the general division of the Neolithic. However, the other aggregation of pottery types does not correspond to the typological standards of the Impresso culture. It corresponds fairly closely with the standards of the Eneolithic Danilo culture. It is by all means interesting that this relation is limited only to a certain type of bowls, while all the other vessels are designed in compliance with the standards of Impresso culture. Decorated pottery relates to the ceramic types of Danilo culture in its deep, softly moulded semi-spherical vessels with a broad mouth and slightly rolled rims, biconical bowls with inverted rims. Monochrome pottery relates to Danilo in its shallow biconical bowls with slightly inverted upper cone as well as in deep biconical vessels with slightly inverted upper cone. Typological connection of Crno vrilo pottery with that of Danilo culture is not limited to a single vessel category. However, if we take into account that bowls are much more rarely represented among monochrome pottery than among the painted one, and that monochrome pottery shows greater variety of types, it may be stated that Crno vrilo pottery apparently relates more to the Danilo monochrome pottery than to the painted one.

Decorations and in general the phenomena of the decorative system of pottery are very important in establishing the relative chronological position of Crno vrilo. In this context we are quite certain that the entirety of decorative system of Crno vrilo pottery ranges within the decorative standards characteristic of Impresso culture of the eastern Adriatic region. This primarily refers to technical procedures of making decorations, basic principles of grouping and composition of decorative motives in more complex ornamental patterns. In this context these finds may be related to the analogous finds from a variety of the Early Neolithic sites of the eastern Adriatic littoral. However, special features and rather big differences between Crno vrilo pottery and equivalent pottery from all the

sites to which it should be compared are much more important for dating of Crno vrilo within the Impresso culture.

Special traits of Crno vrilo decorative system are best identified by a variety of decorative techniques, delicacy of performance, variety of motives, sophisticated organisation and composition of decorative elements, showing tendency to spread the decoration all over the vessel surface and finally general level of its artistic achievements. In its entirety this decorative system is not determined only by a skilful repetition of standardised and easily recognisable artistic issues, but avoidance and abandonment of principles, introduction of new ideas, search for different ways and means of expression and their application. Therefore, the Crno vrilo pottery is far beyond all the phenomena of the system of decoration of Impresso culture recorded so far from the eastern Adriatic region. It also contributes a lot to the image of decorative abilities of its people. Due to everything brought out above about the decorative system which expresses the harmony between the energy devoted to express artistic affinities of the community and resulting decoration, Crno vrilo may not be observed at the same time scale as classical sites representative of Impresso culture in the eastern Adriatic littoral. At best, Crno vrilo may coincide temporally with them only partly, which means that it should be observed at the time scale closer to the final phase of the Early Neolithic. The same is indicated by parallel Neolithic sites on the Apennine peninsula. Namely, composition of decorative patterns with triangles filled with incised ribbed edges of shells analogue by these from Rendina III, were dated to the time of discontinuation of Crno vrilo settlement. However, since their total number was rather small, which means that their *coincidence in time* with the deposits which belong to Rendina III could be only partial. This means that only the end of settlement at Crno vrilo corresponds with that Rendina phase. This further implies the conclusion that it may be parallel to the older phases of that site (Rendina II). Since the pintadera from Crno vrilo is directly connected with a number of same specimens from the same site, all assigned to the phase III, this relationship seems to me quite acceptable. It is not contrary to the possibility of relating this fragment with the combination of classical Impresso technique and surface painting to individual Rendina III fragments with yellowish mat painted decorations.

In addition, proposed relative chronological position of Crno vrilo may be to a defined extent confirmed by the fragment of four-legged rhyton. Its record as well as the development of rather complex religious concepts are congruent with the developed phase of the Early Neolithic that is the time span immediately preceding (or coinciding in time) the formation of culturological horizons under the common name the Middle Neolithic. However the eastern Adriatic Middle Neolithic was identified with Danilo culture.

As to the absolute time span, there are six radiocarbon dates for Crno vrilo. They were obtained from the samples analysed in three different laboratories. It should be pointed out that these samples were targeted aiming at establishing the likely time of establishment and discontinuation of the settlement or the time span of its duration. This means that analysed samples were always collected from the lowest and highest part of the cultural deposit. To make a direct comparison of obtained dates, a pair of samples with identical sampling circumstances were analysed in different laboratories. This means that analysed samples originated from identical research entities and have identical stratigraphic positions.

The comparison of obtained radiocarbon dates suggests that the settlement of Crno vrilo site was occupied at some time between 5800 and 5600. This broadly agrees with the estimate of its relative chronological position established on the basis of comparative analysis of technological-typological and stylistic-typological properties of collected samples and analogies with other Early Neolithic sites. Taking into account only those radiocarbon dates for the eastern Adriatic which may be accepted now, discussed further on, it is obvious that the dates obtained from older samples from Crno vrilo may be easily compared with the dates obtained from the samples SI – 2217 and SI -2219 from Odmut (Odmut IIa), SI-2222 from the same site (Odmut IIb), sample GrN -15236 from Tinj (Tinj I) and sample Z – 1968 from Vela spila I. On the other hand, dates obtained from later samples from Crno vrilo are comparable with dates from the samples SI-2223 from Odmut (Odmut IIb) and GrN – 15237 from Tinj (Tinj I). Of course, the comparisons are only approximate and they clearly point to the conclusion that the rhythm of development of the Early Neolithic was rather uniform in the eastern Adriatic littoral. On the other hand, they show pronounced technicistic character of earlier scientific reconstructions almost exclusively based on radiocarbon dating, particularly of those which should be taken with caution. I will discuss this in the course of further discussion.

As to the site from the Apennine peninsula which are fairly closely related with some phenomena of decorative system of Crno vrilo – Rendina, Trasano and Capo Alfieri - temporal

comparisons are impossible since the dates originating from Italian samples give rather wide time spans which cannot be used for sophisticated comparison with those from Crno vrilo.

VIII The dawn of neolithic

The recently completed systematic excavations of the early Neolithic site of Crno Vrilo near Zadar have supplemented to a considerable extent the previously existing gaps in knowledge of this chronological segment of the Neolithic in the eastern Adriatic, and in terms of the abundance and diversity of the finds, this site has proven to be one of the most characteristic early Neolithic agglomerations in the eastern Adriatic, with all features quite appropriate for a social community from this period of prehistory. Although in terms of the chronological and developmental ranking of sites of the early Neolithic in the eastern Adriatic it does not belong to the very beginning of this period, questions relating to this shall be addressed in this article. There are several reasons for this, but only a few basic ones will be listed here. **First.** In the recent period, such problems have again gained a predominant place among questions related to this prehistoric period in the eastern Adriatic region, and it is natural that each new investigation into the early Neolithic, whether or not it encompasses its very beginnings or somewhat later chronological and developmental segments, inherently implies inclusion in this discussion. **Second**. A quite significant number of researchers who have addressed these questions in recent years, either as primary or secondary problems in a broader spatial context, have approached these themes from varied positions, and consequently the suggested solutions are quite divergent, and sometimes even completely opposed.

Although they all mostly depended in their studies on the same data, usually thought to serve to a greater or lesser extent in explicating the process of the spread of the Neolithic lifestyle, it nonetheless must be emphasized that the greatest portion of such data is of quite indirect character, meaning that the data are taken from published texts, sometimes selectively and sometimes in an overemphasized fashion, and that there is an exceptionally small number of researchers who know the relevant information and finds at firsthand, not to mention those who have even had the chance to study thoroughly these sites they refer to in their studies. This fact in and of itself would not be particularly important if it were not that a significant amount of data is less than trustworthy, and hence such data cannot represent a reliable basis for inferring far-reaching conclusions. Certain data in fact come from excavations undertaken long ago in circumstances that that did not provide even the much-needed minimum of security in their scientific quality, and as even the documentation from these excavations is neither exhaustive nor of adequate quality, it is entirely clear that their value is intrinsically quite hypothetical, and hence their importance as a fundamental basis in constructing a further hypothesis is highly diminished (this refers, for example, to the excavations at Škarin samograd and Gudnja).

Third. As a strong argument in reconstructing the dynamics and nature of the process of Neolithization in the eastern Adriatic absolute dates acquired through the C^{14} method are regularly cited, which come from samples from several sites of the early Neolithic of this region, and as a consequence of chronological relations acquired in this manner, conclusions are presented not merely about the modalities and directions of the spread of those elements that determine this period of prehistory, but also the dynamics and character of the process of Neolithic change in the eastern Adriatic as a whole. Although no doubts need be expressed about the importance of absolute chronologies, nor should the method itself be brought into question, here it is necessary to emphasize in particular a fact that has mostly been avoided in all contributions to the present, which is particularly important because some of these dates are taken as key parameters in the reconstruction of the dynamics of the process of Neolithization and the development of the theoretic model and mechanism of the inclusion of the Adriatic area in the broader Neolithic community of southeastern Europe. In fact, some of these dates are extremely suspicious primarily because they were acquired from samples from highly undependable stratigraphic positions, as the excavations in question were not excavated stratigraphically; also because these samples were extracted in conditions that did not guarantee their essentially important purity; and finally because an extremely long span of time extended between the extraction of samples and their use for analysis, during which the samples were stored in a totally unsuitable manner (the sites of Škarin samograd, Pokrovnik, Gospodska pećina, and Gudnja). The dates from Gudnja are perhaps one of the most characteristic examples of theoretical constructions that can result from a complete ignorance of the actual situation at the site. On the other hand, such an approach gives this scientific method a completely different role than it

naturally has, as chronology has the primary task of temporally framing individual developmental units, in fact determining the chronological framework in which individual forms of material and spiritual culture originated and evolved, in which certain processes or a series of more or less related processes occurred, and so forth, but it definitely cannot be used for any independent investigation of the very course of events and their nature, the contents of individual developmental units, changes in the means of production and economic relations, changes in the material and spiritual culture, and in particular it cannot be utilized in the interpretation of the nature of these processes and any arbitration of their variabilities.

Fourth. The researchers involved in studying the early Neolithic of the eastern Adriatic and particularly the reconstruction of the mechanism and model of Neolithization include only a very small number of those who were thoroughly involved in the study of its environmental traits as well, and particularly the variabilities and environmental features of specific regional units, and in this manner attempted to comprehend the process of the transition from the Mesolithic to the Neolithic and to suggest a model of Neolithization that would be archaeologically documented, historically based, culturally consistent and coherent, and at the same time in harmony with the environmental characteristics and natural potentials of the area, its connections with other regions in the broader vicinity, and so forth. However, there is no doubt that the structure and relief of the area, its pedological, hydrological, climatological, and botanical properties, interior and exterior transportation connections, etc., represent the complex of factors that determine all segments of actual life, starting from the form and type of settlements, their distribution and general density of inhabitation, the similarities and differences between individual settlement micro-locations, to the type of economy and economic strategies, the way of life, the social organization, the material culture in the specific sense, and so forth.

Considering the cited insufficiencies in approach and the outlined necessary directions for compatible research, it is my opinion that the investigation of the early Neolithic of the eastern Adriatic and all questions related to this cannot be solved through the singling out or emphasis of individual aspects, such as stratigraphy, chronology, economic structure, etc., but rather through the study of a complex of mutually related questions. In that sense, three fundamental complex questions will be presented here, which naturally can be further divided into an entire series of finely nuanced aspects, as follows:

1. The distribution of the sites and spatial-settlement units of the early Neolithic, their interrelations with the geographic units of the eastern Adriatic, their environmental characteristics and economic potential;

2. The population potential of the autochthonous Mesolithic substratum and its possible role in the process of Neolithization, with a comparative overview of the stratigraphic, settlement, and economic indicators at Mesolithic and early Neolithic sites;

3. The reconstruction and interpretation of the developmental processes with comparative chronological relations.

In the context of the outlined complex of questions related to the issues of the early Neolithic, in my opinion the very distribution of the sites that belong to this chronological phase is very instructive. Throughout the entire area of the eastern Adriatic, meaning along the coastline and on the islands, and in the area behind the coast, which according to geographical criteria is an integral part of it, at present around 40 definite early Neolithic sites are known, but this number is usually increased by several other sites with finds of Impresso pottery, and in this manner the figure of approximately 45 sites is reached. As this represents the present state of investigation, and not the final number that will certainly be increased by future research, a preliminary conclusion about the fairly significant inhabitation of the Adriatic region even at the beginning of this period is fully justified. Although the mapping of all sites of the early Neolithic can create the impression of a relatively even distribution along the entire Adriatic, along with a relatively even inhabitation of the entire area, and subsequently an impression that this distribution was independent from the geographical features of individual sections, a more careful analysis clearly reveals in their concentration certain patterns that indicate a complete synchrony with the geophysical and environmental characteristics of the Adriatic region. Considered in relation to such a regional division, a more careful analysis of the distribution of the early Neolithic sites shows a reality that can be defined in the following manner.

First. There is no uniformity in the distribution of settlements of the early Neolithic along the Adriatic coast. In fact, three spatial units can be clearly distinguished in which all of the sites known at present are concentrated: the first, or northern unit encompasses the southern, mostly coastal, part of Istria and the islands in the Kvarner Bay; the second, or central unit encompasses the region of the Ravni Kotari and the Promina plateau, i.e. the area gravitating to Zadar and Šibenik; and the third, or southern unit encompasses part of the central

Dalmatian islands, the coastal zone south of the Neretva River with the Pelješac peninsula, and the broader Adriatic hinterland, particularly Herzegovina. These cited spatial units of the early Neolithic, and the Neolithic as a whole, are considered to be those parts of the eastern Adriatic that with their archaeological content (the concentration of sites, form and type of settlement, the type of economy and forms of economic strategies, the material culture in the narrow archaeological sense, and so forth), and interior connections and roles throughout the Adriatic region create coherent spatial-settlement units.

The noted spatial-settlement units are not mutually connected, but instead are separated by archaeological almost entirely empty parts of the Adriatic region in which early Neolithic finds, and those from the Neolithic in general, are exceptional discoveries. Such a distribution of sites, meaning their concentration in three spatial units, is not coincidental but is directly connected to the structure, relief, and general appearance of the eastern Adriatic, the variety of its forms and the considerable differences in the landscape, the interior connections, and particularly the those between the sea and the Dinaric Mountains.

Second. In each of the specified spatial units of the early Neolithic quite varied proportions exist between the island sites and those on the coastal and inland parts of the area. In the first spatial unit, in the Istrian peninsula and on the Kvarner islands, this proportion was greatly in favour of the sites connected to the coast and coastal hinterland. Such a proportion was even more evident for the second spatial unit in the Zadar and Šibenik region. In fact, in this spatial unit, all the sites are tied to the coastal and deep hinterland areas, while no island sites exist at all. The situation is very interesting in the third spatial unit, where all the sites in the Adriatic region in the most specific sense are tied to the islands, including the Pelješac peninsula, which is characterized by an almost island environment, while the sites from the continental region are in fact located deeply in the hinterland of Herzegovina.

Third. Given that in the above spatial units in which the sites of the early Neolithic are mostly concentrated no particularly great difference exists in terms of the number of registered sites, significant differences are quite clearly visible in the proportions in which cave and open-air sites are represented. In the Istrian unit, the ratio between these two types is considerably in favor of open-air sites. The same is true of the second group in the Zadar-Šibenik region, where open-air sites are incomparably more numerous than cave sites. In contrast to this, in the third spatial unit of the early Neolithic, this proportion is totally reversed, and cave sites are much more numerous than open-air sites.

Naturally these proportions are neither coincidental nor merely a simple result of the preferences of the early Neolithic communities from individual sections of the eastern Adriatic for one of these kinds of settlements, but are rather a direct consequence of the composition and geological structure of the individual units and the morphological processes that formed their appearance and created the natural conditions in which the early Neolithic communities were not presented with an alternative choice but merely accepted the best possible solution in the given natural circumstances. In fact, in such a context, in place of the choice of the best solution, one could rather speak of naturally imposed solutions. This is confirmed by the fact that the above proportions of open-air sites and those in caves in each of the spatial units were not limited merely to the early phase, but represented a constant for the Neolithic as a whole. In a certain sense, one could analyze in a similar manner the cave settlements in the other spatial units of the early Neolithic, or rather in those sections that in the micro-environmental sense could to some extent be compared to the environment of the southern spatial unit

Fourth. Without reference to questions of specific stratigraphic relations and a more exact developmental and cultural continuity, all the cave sites with an early Neolithic phase are characterized by a large amount of cultural strata. There are almost no caves where the stratigraphy does not consist of several Neolithic strata, sometimes very thick, as well as strata from several other prehistoric periods. This fact speaks in favour of the previously suggested probability of optimal (or imposed) solutions in those parts of the eastern Adriatic and its hinterland characterized by the existence of such Karst phenomena. On the other hand, this quite clearly points to a recurrence in the settlement of the same micro-locations, independent of their cyclical, periodical, temporary, or other nature. In contrast to this, open-air settlements extremely rarely contain multiple strata that belong to various chronological segments of the Neolithic, and sites are particularly rare at which an early Neolithic stratum is accompanied by a stratum from some later Neolithic phase. Inherently, and in contrast to the areas in which cave sites are predominant, this leads to the conclusion that in cyclical or some other type of movement throughout the regions related to open-air settlements, no serious requirement existed to return and renew life at the same micro-location, which further means that any limitations in the choice of settlement micro-locations were incomparably smaller.

In terms of the Mesolithic sites, i.e. the Mesolithic population potential, there is much less to consider because there are fewer sites. At the present level of investigation in the region of the eastern Adriatic the potential of the Mesolithic substratum has been confirmed at Crvena Stijena, Vela Spila at Vela Luka, Kopačina Cave on the island of Brač, and with individual finds from as yet uninvestigated sites in the Ravni Kotari region, Jamina Sredi, and the caves of Vorganska pećina, Pupićina pećina, Klanjćeva pećina, and Podosojna pećina. Even this minimal number of presently known sites unequivocally confirms that in the period that preceded the Neolithic the eastern Adriatic region was neither empty nor unsettled, which in and of itself raises the question of the position and role of the autochthonous substratum in all the processes that mark the beginning of the Neolithic in this part of Europe, and this implies the spread, stabilization, and full affirmation of the fundamental innovations encompassed in the concept of the "Neolithic package", with all further consequences to the development of settlement aspects, economic-social relations, the material culture, cults and spiritual culture, etc. Solving this question is primarily tied to the possibilities of establishing the actual contact between the Mesolithic and Neolithic communities, but some possibilities can be indicated to a certain extent by indirect data. For example, the southern Adriatic Mesolithic sites exhibit a spatial arrangement similar to that characteristic for the early Neolithic sites in this same section of the Adriatic region.

In terms of the relations between the Mesolithic and Neolithic communities, or in fact the question of the participation of the autochthonous population in the process of Neolithization, I have already expressed my opinion quite clearly several times, which I will repeat once more here. The autochthonous Mesolithic population represents the fundamental demographic basis on which the Neolithic communities of this area developed, and the total population pattern in the early Neolithic was primarily a result of interior demographic development, to a great extent related to qualitative changes in the economy and in general to different circumstances of life. All interpretations that minimize or completely exclude this autochthonous substratum can be evaluated as pure speculation unsupported by any firm argument. That is one aspect. Another aspect concerns the very mechanisms involved in the process of Neolithization, i.e. the model according to which this took place. Varied opinions have been expressed about these questions and other problems related to them, although all of them are based on data from the very same sites.

One site in this context from the southern Adriatic region that has long occupied a separate position is Crvena stijena, the first site where an Early Neolithic stratum was investigated and the relation to the Mesolithic stratum was confirmed. As is well known, the early Neolithic layer (stratum III) follows directly above the Mesolithic stratum IVa-b. That sequence is important above all for stratigraphic reasons, as between the Mesolithic and early Neolithic strata there is absolutely nothing that could indicate the possibility of an interruption in settlement and a temporal hiatus. On the other hand, this sequence is also important because of the developmental and cultural continuity most evident at this site in the strong Mesolithic tradition in the working of the Neolithic flint tools. Other than finds of pottery, no other differences exist in the cultural remains of the Mesolithic and Neolithic strata, and in this general continuity one of the essential links between strata IV and III is the identical way of life based on a hunting economy, documented by the present of various species.

In the recent period, the problem of the relation of these strata has again become topical because of data about the presence of feral (Balkan) goats (*Capra hircus L.*), which is taken as one of the crucial arguments in various interpretations and for the very process of Neolithization in the eastern Adriatic. As this data can be cited in various manners, and this citation has implications for the character of the interpretation, particularly of the citation is limited merely to data from the Mesolithic stratum, it should be emphasized in particular that the finding on this by M. Malez was quite summary, and did not refer exclusively to stratum IV but rather to all the Holocene strata, which at this site also encompass strata III-I, representing a chronological span from the early Neolithic to the Bronze Age, and did not include claims about the domestication of the goat, but rather suggested the possibility of its distribution in this area as early as the early Holocene, and only consequently the possibility of its domestication.

Another site that is regularly taken into consideration in the context of this theme – the cave of Odmut – does not in fact belong to the Adriatic region, but rather is located deep within the continental interior. The basic stratigraphic sequence at Odmut corresponds to the stratigraphy of Crvena stijena. The earliest stratum of this site (stratum Ia-b) belongs to the Mesolithic, followed by the early Neolithic stratum IIa-b. However, stratum II is not culturally uniform, as the pottery finds from its earlier segment (IIa) are related to the Starčevo circle, while those from the later segment (stratum IIb) have all the characteristics of Impresso pottery. Although the question is not raised in the excava-

tion report, this fact nonetheless leaves open the problem of continuity in the use of the cave during the early Neolithic, and this significantly impedes discussion of the relation between the Mesolithic substratum and the early Neolithic communities of the southern Adriatic. Considering that this problem cannot be solved on the basis of the available data, two other facts can be taken into account whole value is not inconsiderable. One is related to the flint artifacts that allow for a continuity between strata I and II, given that the flint from the Neolithic stratum is characterized by an evident Mesolithic tradition in form and techniques of working, and the other is connected to economic aspects of the Mesolithic and Neolithic communities, given that the taxonomic groups from the Mesolithic and Neolithic strata exhibit a high degree of concurrence. In that context it is very important that in stratum II, despite the presence of domestic species, the proportion of wild animals had not declined dramatically, and their structure was only minimally modified. In consequence there is no doubt that there had been an economic continuity that in the early Neolithic of this site can be perceived in the further predominance of the traditional Mesolithic type of economy with a hunting component as the basic economic branch and a stock-raising component as a quite secondary branch. Considered just by themselves, such relations between economic branches in stratum II could be interpreted in various ways, and the most attractive would probably be the idea that their complete concurrence in fact represented the transition from the Mesolithic to the very beginning of the Neolithic. However, in comparison to the relations established for strata III (middle Neolithic) and IV (late Neolithic), with almost identical values, the relations in stratum II acquire a somewhat different aspect. As the proportion of domesticated animals increased significantly only at the end of the Neolithic, but even then the percentage was less than half of that of wild animals, it is apparent that the economic relations at Odmut II were neither temporary nor were the merely coincidental results of just initiated first steps in the transition to a productive economy, rather this can be noted as a specific type of economy characteristic for this site throughout the entire Neolithic. Such a type of Neolithic economy and Neolithic culture in general can be determined exclusively according to the objective natural traits and environmental characteristics of the spatial region, as determining the form and type of economic activity and the way of life in general.

The third relevant site for this topic is Vela Spila on the island of Korčula, with successive superimposed layers from the Mesolithic and early Neolithic, as well as strata from the Eneolithic and Bronze Ages. The most interesting relationship is that of the Mesolithic (the strata of phase 7) and Neolithic layers (the strata of phase 6). The researchers insist on a continuity of settlement in the cave, but in terms of cultural continuity are adamant about significant differences in the flint artifacts, which do not support the possibility of uninterrupted development. On the basis of the stratigraphic indicators and certain characteristic phenomena in the faunal record, it is possible to hypothesize several short-term interruptions in the utilization of the cave, with one such gap just at the crucial period of the transition from the Mesolithic to the Neolithic. Considering this likelihood, the evident cultural discontinuity between the Mesolithic and the early Neolithic displayed through the differences in the flint artifacts, and the lack of the Mesolithic tradition as an essential element uniting these periods and the corresponding layers becomes inherently understandable. This is no longer the expression of a real developmental discontinuity, but merely the result of an intermediary developmental phase formed in some other place at a time when the cave of Vela Spila was not in use.

In terms of the faunal record, or rather the record of economic activities as an important comparative element for the late Mesolithic and early Neolithic communities of Vela Spila on the one hand, and these essential determinants of the content and character of the Neolithization of this area on the other hand, it is necessary to emphasize the great degree of concurrence with the faunal record in the corresponding strata of Odmut and Crvena stijena, particularly in reference to the Mesolithic strata, as the structure of the hunted animals indicates the predominance of types characteristic for a forested-mountainous biotope. The presented data about the structure of the fauna during the early Neolithic do not indicate dramatic changes in the economic structure, in which the hunting component, followed by fishing and gathering sea food, remain very important economic activities.

The fourth site that is very often cited in this context is the cave of Gudnja on the Pelješac peninsula near Ston. Despite the frequent citation, however, the fact is that its exact archaeological content and stratigraphic relations were not known to the archaeological public up to the recent monographic publication. In fact, highly varied and basically completely inaccurate data were instead presented. Concentrating merely on the early Neolithic stratum, which at this site was the oldest archaeological formation, I must emphasize in particular that this

layer was excavated in a truly small area, that it was very thin (a maximum thickness of 0.30 – 0.35 m), and as a whole it contained very few finds, all of these facts indicating a community of few members and only a brief stay in the cave. The archaeological finds that could be taken into consideration in analysis of the cultural aspects of the early Neolithic at Gudnja indicate an archaism that can be seen in the simplicity of the ceramographic traits of the scarce pottery finds on the one hand and the Mesolithic tradition of the scarce flint artifacts on the other. In terms of this, and despite the carefulness required by the scarcity of the finds, it can be noted that the early Neolithic at Gudnja is quite close to the early Neolithic of Crvena stijena. Perhaps in the chronological sense no compete concurrence exists with stratum III of Crvena stijena, but in terms of the cultural content and its most important determinants no major and substantial differences can be said to exist. Although I will return to the question of chronology somewhat later, I must immediately emphasize here that the radiocarbon dates, regularly cited in the literature as one of the essential temporal guidelines for the dynamics of the Neolithization process, come from totally insecure contexts and have absolutely no worth whatsoever in the manner in which they are being used.

It is impossible to speak exactly about the economic activities of the users of Gudnja cave as the faunal finds are scarce and are also stratigraphically, i.e. culturally, unreliable, and hence have no weight whatsoever in the reconstruction of the economic system of the Neolithic in the Adriatic region.

In the central Adriatic region, or the central spatial-settlement unit of the early Neolithic, only one site exists that is regularly cited when discussing this subject – Škarin samograd – primarily because of hypotheses about the character of the early Neolithic stratum and its division into two phases. As this is a site that was excavated almost half a century ago and which has never been published, here I will noted several basic facts in opposition to the significance that is attributed to it:

- The excavation was performed according to the principles of arbitrary excavation, with sometimes very thick excavation layers (over 0.30 m);
- The excavation records are quite summary and lack data about individual stratigraphic formations and their mutual relations;
- The technical documentation is fairly scarce and is limited exclusively to quite rough sketches of the profiles;
- The photographic records are quite poor;
- The manner of establishing and presenting the stratigraphic positions of individual stratigraphic formations and their mutual relations is completely unusual, because of which these data must be recalculated according to a specific methodology;
- The excavation performed according to arbitrary levels means that the archaeological finds, grouped in mechanically dug layers, occasionally do not belong to the same archaeological formations, but rather totally different ones;
- The problem of the mixing of finds from different stratigraphic units represents a lesser problem in those cases when the finds come from a significant chronological span and they can clearly and easily be distinguished from one another, but when it is a question of brief chronological spans that can be established primarily though noting fine stratigraphic caesurae in the layer itself, and only partly through certain differences in the typological traits of the pottery finds, then the problem is considerably more complicated, and in some cases insurmountable.

Given these circumstances, it is quite clear that at Škarin samograd it is not possible to make an exact reconstruction of the stratigraphic relations, but merely an approximate one, and hence distinguishing one part of a stratum that would be characterized merely by monochromic pottery can only be performed somewhat arbitrarily, because of which such defined phases in the development of the Early Neolithic do not represent any firm foundation for further reconstruction and interpretation. For the same reasons, the faunal material is also totally useless, not to mention the radiocarbon dates, whose dubious nature I have already pointed out.

All in all, it should be noted that Škarin samograd nonetheless deserves considerable attention because of its micro-position, determined by the morphology and environmental features of its natural surroundings, because of which the site itself, although it is a classic cave settlement, differs considerably from all the other such sites, as the cave is located in the sheer walls of a small Karst hollow that could have served as a kind of natural pen where it would have been possible to a hold a large flock of sheep. The broader area where the site is located would be most suitable for raising sheep in particular.

One more site – Gospodska pećina – is usually cited for this spatial unit in the context of the early Neolithic, primarily because of the radiocarbon dates, but in fact they cannot

be securely related to any archaeological context. Additionally, since only extremely scarce examples of Impresso pottery are known from the cave, despite excavations undertaken by two researchers, it is quite apparent that this was neither a settlement site nor even a Neolithic site in the true meaning of the term, but rather simply a place that was perhaps used by individuals, hunters, or shepherds as a temporary shelter.

In the northern Adriatic spatial-settlement unit only one site is especially important in this context – Jamina Sredi – with strata of the upper Paleolithic, Mesolithic and early Neolithic. The data about the Mesolithic and early Neolithic relations are not exhaustive, and in this context the following explicitly stated facts are relevant: that there was no sterile layer between the Mesolithic and Neolithic strata, that in the early Neolithic stratum finds of wild animals were absolutely predominant, and that remains of domesticated animals were quite minimal.

Taking into consideration all of the above facts, as well as other reliable facts from other early Neolithic sites (and in general Neolithic sites) from the broader eastern Adriatic region, the actual situation of the early Neolithic of the eastern Adriatic is determined by the following facts:

First. All of the presently known sites that are usually connected to the very beginning of the Neolithic are related to caves, which might suggest the conclusion that sites of this type could be considered a typical feature. However, it is also true that cave sites are not exclusively a characteristic of the early Neolithic, rather they are equally common during the later chronological segments of the Neolithic. In fact, among all the caves sites known to date with an early Neolithic stratum in not a single one is this stratum the only archaeological formation. As a rule, several strata are represented that belong to various chronological segments of the Neolithic, as well as to various prehistoric periods, which means that the cave sites are characteristic of the Neolithic as a whole, and not merely its latest chronological segment. Nonetheless, most of the caves lack a complete stratigraphy encompassing all the chronological and developmental phases of the Neolithic, which clearly indicates their periodical utilization during lengthy or brief spans of time, and hence the cyclical exploitation of the same micro-regions. There is no doubt that this was related to the type of economy and economic strategies.

Second. All of these sites are related to very similar rocky or hilly-mountainous environments characterized by exceptional ruggedness and sharp drops of the landscape without cultivable surfaces, or to totally sterile Karst areas, in the Adriatic region particularly characteristic for the southern spatial-settlement unit, as well as for the island part of the northern unit. This means that the uniformity of the environmental traits also determined the selection of identical micro-locations, i.e. the very type of site. In terms of micro-location, the cave sites of the early Neolithic do not exhibit any differences whatsoever from the same kind of Mesolithic sites, and in certain significant examples, this refers to the very same cave areas. Similarly, the environments of the cave sites of the early Neolithic do not differ from the environments of the later Neolithic sites, nor from those of the prehistoric sites of this type in general.

Third. At almost all the cave sites where the early Neolithic layers were not the earliest archaeological formation, but instead followed Mesolithic layers, and independent from the question of the full stratigraphic, developmental, and cultural continuity, a very characteristic element was the Mesolithic tradition, as expressed in the typology of flint artifacts and the technology of their workmanship. The only exception to this was Vela Spila.

Fourth. In all of the cave sites of the early Neolithic, without exception the faunal record shows a complete predominance or significant preponderance of wild species, which indicates the predominance of hunting components in the totality of economic activities, which implies a strong Mesolithic tradition in the economic elements. However, at all of these sites the faunal record was very similar even during later chronological phases, and sometimes was even completely identical to the faunal record from the early Neolithic strata, which means that the economy of the community utilizing a cave shelter was not determined merely by their chronological position but was also dependent to a great extent on the environmental features of the area in which the cave was located. The economic situation of the Adriatic Neolithic as a whole is not characterized either by dramatic or sudden changes, and stock-breeding and hunting, both in varied mutual proportions as well as in proportion to agriculture, retained an extremely important place in the economy throughout the entire Neolithic.

Fifth. There is not a single early Neolithic cave site where the remains of cereals have been established, but they are also nonexistent at cave sites in layers corresponding to later chronological phases of the Neolithic, as well as to later prehistoric periods. As this fact can no longer be justified today as a mere result of poor excavation techniques, or a lack of

certain procedures in recovering material, it is apparent that this absence in fact represents a constant and that it was the result of economic strategies that corresponded to the local environmental characteristics, i.e. the absence of cultivable land in the infertile Karst areas or mountainous regions.

Sixth. The cave sites related to the very beginning of the Neolithic exhibit varying thicknesses of the relevant strata, which points to the varied chronological periods in which they were formed, or the varied lengths of time in which the caves were used. Viewed as a whole these were mostly thin deposits – with an average thickness of ca. 0.40 m – which indicates a community with a smaller number of members on the one hand, and an emphasized mobility on the other. However, this relatively short duration of inhabitation, or pronounced mobility, as expressed by a relatively thin deposit, is equally characteristic for the late phases of the Neolithic but also for almost all settlements of the later chronological segments of the early Neolithic, hence even an increased mobility of the social community cannot be considered an exclusive characteristic of the first phase of the Neolithic.

Seventh. The early Neolithic open-air sites belong to an entirely different environment and are concentrated primarily in the central spatial-settlement unit, as well as somewhat in the coastal section of Istria. All of these sites are related to very similar environments where the main characteristic is a peaceful landscape without sudden ruptures of the terrain, with accessibility and interior connections, a favourable hydrographic network, and to a great extent the existence of cultivable areas (as exemplified by the Ravni Kotari region in the hinterland of Zadar).

Eighth. At all open-air sites for which exact data of this type exist, the faunal records indicate a total predominance of domestic species over wild animals, which quite clearly define the interrelationships between the stock-breeding and hunting components in the economy. Among the domesticated species, the finds of goat and sheep greatly outnumber the bovine (cattle) finds. At the same sites maritime fauna is represented to a great extent, especially mollusks, whose presence cannot be equated with the gathering activities of the Mesolithic type but is instead the result of special economic activities related to the intensive exploitation of maritime resources.

Ninth. At all open-air sites where flotation or at least sieving was carried out, the presence was established of cereals from at least two kinds of grains: *Triticum monococcum* and *Triticum dicoccum*. Although the mutual relations between agriculture and other economic forms cannot be evaluated, and their individual roles cannot be determined in the totality of economic activities, the finds of grains indicates an important difference in the economic structure between the communities utilizing open-air settlements and those utilizing caves. However, since this difference has no chronological dimension, meaning that it is expressed independently of the chronological assignment of individual sites to a certain phase of the Neolithic, no interpretation can be accepted that would imply an unconditional chronological priority of stock-breeding in comparison to agriculture in the eastern Adriatic.

Tenth. Differences in the economic structure of the open-air sites and the sites in caves were evidently caused primarily by objective natural features and environmental characteristics of the area that determine all forms and types of economic activity, as well as the lifestyle in general. In other words, the economic structure with an emphasized or dominant Mesolithic tradition, meaning the predominance of the hunting over the stock-raising component, is not determined by the chronological position of the sites, or their greater age, just as the more complex economic structures with developed stock-breeding and agricultural components are not necessarily related exclusively to the later chronological phases of the early Neolithic.

Eleventh. The chronological starting points for the reconstruction of the process of Neolithization in the eastern Adriatic region have been published several times and are very well known. Their reliability, however, is extremely dubious in several cases. Hence only the dates from Odmut, Vela Spila, Tinj, and Crno Vrilo can be taken into consideration here, along with the dates from Pupićina pećina as an approximate orientation for the upper limit of the Mesolithic and the lower limit of the middle Neolithic. Comparisons indicate that the differences between the earliest dates for individual sites with finds of Impresso pottery are so minimal that all these sites can be considered synchronous.

Odmut

SI - 2217 6985 ± 100 BP, 5960-5750 (5830) CalBC
SI - 2219 6955 ± 100 BP, 5980-5730 (5810) CalBC
SI - 2222 6985 ± 100 BP, 5840-5640 (5740) CalBC
SI - 2223 6530 ± 100 BP, 5520-5370 (5480) CalBC
Z - 412 6736 ± 130 BP, 5730-5490 (5630) CalBC

Vela Spila
Z - 1967 7300 ± 120 BP, 6230-6000 (5120) CalBC
Z - 1968 6990 ± 90 BP, 5980-5730 (5830) CalBC

Tinj-Podlivade
GrN - 15236 6980 ± 160 BP, 5980-5719 (5830) CalBC
GrN - 15237 6670 ± 260 BP, 5760-5340 (5560) CalBC
GrN - 15238 6280 ± 210 BP, 5470-4950 (5249) CalBC

The dates acquired from the Crno Vrilo samples represent an exception in this context, but they are a result of its actual chronological position in the development of the Impresso culture and the early Neolithic in general.

Questions related to the beginning of the Neolithic in the eastern Adriatic region have been resolved in various ways in the literature, but despite the differences, the published opinions can all be classified into two quite polarized groups. The first group consists of those supporting an autochthonous origin, in the form of processes taking place within the local communities, while the second group prefers a dominant role assigned to migratory components. I have clearly stated my opinions on this subject several times in favour of the dominant role of the autochthonous substratum.

The first group, or rather the scholars that speak for this opinion, base their arguments on the following:

- The Mesolithic populations whose presence has been proven at a relatively significant number of sites;
- The stratigraphic data that show a direct sequence of Mesolithic and early Neolithic strata;
- Emphasized Mesolithic traditions in the lithic industry belonging to early Neolithic contexts;
- A distinct similarity, and often complete correspondence in the character of the economy and economic strategies of the Mesolithic and early Neolithic communities;
- Similarities and often identical elements in the settlement features of the Mesolithic and early Neolithic communities.

As can clearly be seen from the above discussion, all of these arguments correspond to relatively tangible material facts, meaning that the final hypothesis belongs in the framework of objectively possible solutions.

In contrast to this, the opinion of the second group is based on the following:

- The assumption that the introduction of a productive economy without fail entails the movement of its bearers, or various forms of migration by small or large social units, which is most often identified with their settling in the eastern Adriatic region;
- Hypothetical routes and manner of movement by immigrant communities, most often by sea;
- Chronological differences between individual sites or strata acquired through radiocarbon dating.

Other than these hypotheses, this second group of opinions has no other arguments, and as each of the individual starting positions, including their combination with radiocarbon dates, has a totally hypothetical character, it is quite clear that the final hypothesis did not result from reliable material facts but from an entire series of individual speculations.

Proceeding from the facts available at present, it is entirely clear that the beginning of the Neolithic in the eastern Adriatic region cannot be analyzed through simplified approaches of any kind, and particularly not through distinctly speculative models of various forms of major population expansions and movements. The archaeological realities of this region are considerably closer to various forms of interactive relations of population groups corresponding to different cultural environments.

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