FEATURED

THE BALKANS
How salt brought wealth and violence to a Copper Age community

PEARLS IN PREHISTORY
Did pearl fishing fashion the Middle East?

EGYPT’S SUNKEN CITY
A legendary port emerges from the sea

PLUS
CHINA: BEIJING AND THE GREAT WALL
LONDON’S POMPEII: ROMAN LIFE IN LONDINIUM
PORTUGAL: NEOLITHIC ART IN AN IRON AGE FORT

PERU
Revealing the imperial glory of three Wari queens
Provadia Solnitsata

How salt brought riches, order, and violence to a prehistoric settlement.

The oldest and richest gold grave goods ever found were discovered at Varna in Bulgaria. Now, just down the road, Vassil Nikolov has uncovered a site with massive fortifications and evidence of a thriving industry producing one of the world’s most valuable commodities: salt. Was this the source of Varna’s wealth?

People were constantly on the move in the region around the Provadiyska River basin during the Neolithic period, and it is easy to see why: the land is poor and unsuitable for agriculture. Those eking out a living through animal husbandry needed to move their herds regularly between winter and summer pastures. The archaeology shows settlements did not exist long enough to leave thick deposits, with people moving on as local resources were depleted. So, why did they persist in this unwelcoming environment?

Tell Provadia-Solnitsata has the answer. Today, it lies near the modern city of Provadia, about 40 km (25 miles) from the Black Sea. Archaeologists led by Prof. Vassil Nikolov began excavating here in 2005 and have uncovered evidence of a thriving industry that dates from the Neolithic period about 7,500 years ago, through to the Middle and then the Late Chalcolithic periods (Copper Age) at the end of the 5th millennium BC. The settlement seems to have enjoyed a long and continuous occupation, and is the only tell site in the Provadiyska River catchment.
The complex was surrounded by impressively massive fortifications. These protected its inhabitants, who lived in two-storey houses and worked in a designated industrial area; their ritual sites and burial of their dead reflect the establishment of social and economic order.

The clue to this settlement’s success lies in its name. Solnitsata means ‘saltworks’. While the region is not good for agriculture, it does benefit from one rare but highly prized natural resource: salt. Throughout human history, salt has been a necessary and valuable commodity. It was even used as currency in later times – wages were often paid in salt, giving us the word ‘salary’ from the Latin sal, meaning salt.

Povadia-Solnitsata sits on a huge, truncated salt cone, the so-called Mirovo salt deposit – the only source of rock salt in the entire Eastern Balkans. Salt springs flow from it to the surface, and these natural brine springs were exploited by the inhabitants who settled at Povadia-Solnitsata.

Much of the site lies beneath a massive Thracian tumulus that was built thousands of years later, cutting some of the earlier layers and incorporating much of the tell’s cultural deposits. The great height of this later tumulus has made excavation here especially tricky for the archaeologists. Even so, Prof. Nikolov and his team have uncovered the remains of two-storey houses along with evidence for salt processing on a major scale. Before being partially destroyed by the tumulus builders, Tell Povadia-Solnitsata had a cultural deposit 9m (30ft) thick and 105m (345ft) in diameter.

Salt works
In about 5500 BC, people left their fertile homelands in Thrace and settled here next to the brine springs, where they began to exploit the natural salt reserves.

During the first two or three centuries of the Late Neolithic, the salt was harvested by collecting brine from the springs in ceramic bowls and evaporating the water in ovens to produce salt ‘cakes’. It is, says Prof. Nikolov, the earliest record of this technological process for salt production in Europe. The brine was collected in specially made thin-walled ceramic bowls, and placed in massive dome-shaped kilns in houses throughout the settlement. This method produced a maximum annual
output of ten tons of rock cakes, most of it intended for export, probably to Thrace.

During the final phase of the Late Neolithic, around 5200-4900 BC, the technology evolved, and output dramatically increased. A new type of ceramic container appeared: relatively thick-walled bowls with two everted lugs on the rim. And production changed from being a cottage-style industry located in individual houses to one that took place in large, purpose-built dug-in structures. These were concentrated in a designated area, located away from the tell nearer to the then Provadiyska River bed. Output significantly increased — this new and improved complex was capable of producing about 35 to 40 tonnes of salt a year.

Salt production really began to take off during the Middle and Late Copper Age, and saw the settlement at Provadia-Solnitsata prosper. Indeed, according to Prof. Nikolov, ‘Salt was the engine of advanced social and cultural processes that pushed the area ahead of any other in Europe.’

During the Middle Copper Age, about 4700-4500 BC, salt production was reorganised. The increased demand for salt drove technological development, and the process was again modified. New, taller ceramic containers with thick walls, capable of holding much larger volumes, were placed in deep, wide pits. In addition, a major new industrial complex was established right next to the settlement, which continued in use into the third quarter of the 5th millennium (4500-4200 BC). The complex now covered an area of at least half a hectare — though the archaeologists believe it may well be much larger — and was capable of both high volumes and rapid output.

‘The late Neolithic salt producers of Provadia-Solnitsata (5500-4900 BC) most probably met their own needs by using the brine itself, while exporting the hard production south of the Balkan Range. In the Middle and Late Copper Age (4700-4200 BC), the production reached an industrial scale for its time,’ explains Prof. Nikolov.

**Defending success**

This highly lucrative industry needed to be protected, and by the Middle and Late Chalcolithic, considerable resources, in terms of time and man-power, were invested in the construction of hefty town defences around the tell. So far, there is no evidence of earlier Neolithic fortifications, but these may be awaiting discovery in

---

**ABOVE LEFT** Excavating a two-storey building with the remains of a dome oven for brine evaporation, dating to the Late Neolithic, 5500-5200 BC.

**INSET** A Late Neolithic altar, found in the north-west area of the site.

**ABOVE RIGHT** Pounding stones used in salt-making during the Late Neolithic.

**LEFT** A hoard of four antler sickles at the bottom of a grain storage bin, dating to the Late Neolithic.
levels yet to be investigated, and the team is confident they are there.

Excavation in two large areas on the south-east and on the north-west of the site has revealed substantial defence structures that extended through several phases of change and development throughout the Chalcolithic period. It appears that they were rebuilt on several occasions, either because of earthquake damage or following population growth within the settlement.

In the south-eastern part of the site, the team uncovered an arc-shaped moat between 2m (6ft) and 3m (10ft) wide, and 2.2-3.3m (7-11ft) deep, dating to the Middle Chalcolithic. A short distance behind it lay a wall with a gateway. Interestingly, the builders of this defence used two very different construction techniques: one part of the wall is a timber palisade faced with clay, the other section is made of stone.

The palisade sits 3-4m (10-13ft) behind the moat to the south. It is a large vertical timber structure about 80cm (2ft 7in) wide by about 3m (10ft) high, covered with a thick clay coating, and runs along the perimeter to the south-eastern gate of the settlement. This gateway is flanked by two massive stone bastions, 4.50m by 3.30m (14ft 9in by 11ft) wide and standing 3m (10ft) high, made of huge quarried rocks. The gateway itself is about 2.4m (8ft) wide, and a street of the same width leads from it into the centre of the settlement.

In about 4600 BC, Provadia-Solnitsata was badly damaged by an earthquake. Debris from the destroyed stone bastions filled the moat but, rather than clear it, the inhabitants dug a new section in front of the gate. They also decided not to renovate the massive fallen bastions but instead built new L-shaped structures, about 3m (10ft) high and about 1.2m (4ft) thick, behind...
LEFT Evidence of ritual and social hierarchy: only the upper half of an adult male was interred in Burial 13, dating to the end of Late Chalcolithic, 4300-4200 BC. His chest had been split open and inside it was placed the severed and tightly folded right arm with his left forearm. The grave goods – ceramic pots and a copper double-spiral pin – are evidence of the buried individual’s high status.

INSET Found in Burial 13 (see above), this copper double-spiral pin dates to the end of the Late Chalcolithic, 4300-4200 BC.

the ruined ones. The timber palisade joins these bastions on their south-eastern side, whereas to the north-east the wall is stone. Sadly, these new fortifications did not last long: just a century or so later, in about 4500 BC, disaster struck once more when another earthquake brought them down.

On the opposite side of the tell in the north-west section, Prof. Nikolov’s team has found evidence of three successive Chalcolithic stone defence works. The earliest was built during the Middle Chalcolithic and is 2m (6ft) wide, constructed using an early form of the opus emblectum technique (with large stones on the surface and smaller stones used for infill) and clay binder. The excavated section is about 32m (105ft) long, and at its northern end the wall survives to a height of 1.5m (5ft), narrowing towards the top on the inside. It seems probable that this early wall would eventually connect with the two great stone bastions.

BELOW RIGHT The Middle Chalcolithic fortification system in the south-eastern part of the settlement comprised stone bastions, a palisade and a moat.

BELOW LEFT The foundation of the wooden palisade in the south-eastern section of the settlement, dating to the Middle Chalcolithic, 4700-4500 BC.
on the south-east of the site, though this will be confirmed by future excavation. Prof. Nikolov also believes that this early perimeter wall was probably angular in shape, and that it is not associated with a moat – indeed, the moat may not extend beyond the southern part of the tell.

The second wall, probably built following the 4600 BC earthquake, replaces much of the earlier one, and again uses the opus emblectum technique. The direction of the wall to the south remains unclear but it probably eventually joins up with the two Middle Chalcolithic L-shaped bastions on the south-eastern corner.

The third and outermost defence wall excavated in the north-west area of the tell was built during the Late Chalcolithic, and is a new type of stone structure. First, they reinforced the steep slopes of the tell with several metres of stone facing, using small- and medium-sized quarried rock up to about 1m (3ft) thick. On top of these foundations they built the solid stone wall, using larger stones at the base, getting gradually smaller towards the top. Today, the rocks lie scattered along the uppermost surface of the prehistoric layer – probably thanks to another earthquake – suggesting that this wall was still protecting the tell right up until the settlement was abandoned at the end of the 5th millennium, around 4100 BC, towards the end of the Varna culture.

Ritual and the dead

Three ritual areas were found at Provadia-Solinisata, possibly each representing a different purpose: two are outside the main settlement and one is located within the salt production complex itself.

The site relating to what the archaeologists call the ‘golden millennium’ or Late Chalcolithic – the most productive time for the settlement – lies 60m (197ft) outside the north-west boundary, and is about 20ha in size. One trench alone has revealed 30 pits, containing charcoal, pebbles, sherds of thick-walled and some thin-walled ceramic vessels, animal bones, and flint tools. Many of the pits intersect, showing a general progression away from the settlement, mostly in a westward direction. Neolithic ritual sites tend to be found near springs or other sources of sweet water and, sure enough, although dating to the Late Chalcolithic, this area is also close to a natural spring.

More ritual pits were found grouped together within an area where salt production was concentrated, to the north-east of the settlement, and date to the Late Chalcolithic, about 4500-4200 BC. It is significant that they do not interfere with the salt-making facilities themselves, suggesting they were either constructed once those structures were already in use, or when activity here had ceased.

Prof. Nikolov draws parallels between here and Neolithic farming communities where sanctuaries dedicated to fertility rituals to promote a good harvest were an integral feature of everyday life. Here, the community was ‘harvesting’ salt but the principle remains the same.

In the centre of this production complex is a large pit that cuts into an earlier grave. The original grave still retained some of its contents: burnt plaster, sherds from the ceramic vessels used in the evaporation process, and three human lower-limb bones – two of which were still articulated at the knee. The three long bones belong to a 20- to 30-year-old man who was buried in a flexed position, lying on his right side. An unbroken pot, standing on its base, was found at the same level as the bones.

There is no evidence of a cemetery in this part of the site, so what is the significance of this burial here in the middle of the salt-making zone? Was this a sacrificial internment related to the salt works? And why was a later pit dug into it?

This pit held no human remains but it did contain pieces of burnt daub, sherds from salt-evaporation pots, some animal bones, and, significantly, two intact ceramic vessels that had been deliberately placed upside down next to each other. The two inverted pots suggest that it, too, served a ritual purpose.

A second burial nearby was that of an adult male, placed in a flexed position on his left side, with his right arm bent at the elbow, his right hand in front of his face, and his left arm extended downwards and bent at the abdomen. A stone hammer-axe with a wooden handle, a symbol of high social status, was placed in his right hand. Close to this grave was another pit – its base is coated in clay and within it were the remains of a deliberately broken evaporation tub.

The partial remains of an adult woman were found in a third pit belonging to this group. The grave had been filled with small- and medium-sized quarried rocks, along with a large quantity of sherds from a thick-walled brine evaporation tub and...
other pottery fragments. Only her long
bones, rib fragments, and the mandible
without teeth were interred, along with a
copper shaft-hole axe and a stone pounder.
Who was she? Are the rest of her remains
carefully interred elsewhere on the site,
still awaiting discovery? The copper axe
is typically a male status symbol, so its
inclusion here only adds to the mystery.
Perhaps, suggests Prof. Nikolov, these
two burials in close proximity are related.
Perhaps both individuals enjoyed leading
roles in the salt industry during their
lives and their interment in the industrial
area, rather than in the cemetery, served a
significant ritual purpose.

Settlement cemetery
The cemetery lies to 250m (820ft) west of
the tell. As all the graves excavated date to
the Late Chalcolithic, the archaeologists
anticipate finding more burial grounds
for the earlier inhabitants. On the western
boundary of the cemetery, grave goods,
including two large copper earrings,
were recovered but no human remains,
suggesting that this was an area used to
commemorate, rather than bury, the dead.

SALTY TREASURE
Other than a few sites along the Black Sea coastline, the area in this part of the Balkans lacks salt,
a vital ingredient that both people and animals need in their diet. Provadia-Solnitsata, therefore,
enjoyed a position of advantage. The settlement sat on a huge reserve that formed part of the
Mirovo salt deposit. The formation of the large salt cone in the Provadiyska River catchment
area occurred when, under strata pressure, a huge amount of salt mass in a plastic state was lifted
upwards to the surface. The salt cone was enveloped on all sides by a kind of marlstone ‘mantle’
that protected it from washout. Its upper
surface is a ‘salt mirror’ – a salt solution
about 1m (3ft) thick, at a depth of 12-20m
(40-60ft). It is shaped like an ellipse with a
surface area of 330,000m².
The salt cone reaches a depth of 4,000m
(13,123ft) where its diameter exceeds 15km
(9 miles). Salt springs flowed out from the
‘salt mirror’ with high salt concentration
values of about 312g per litre – a hugely
beneficial natural resource that has been
exploited since the prehistoric period.
On the eastern side, the team investigated three graves in 2011. All three are flexed burials – two adult males and an adult woman – and all three were laid on their right side with their heads to the north. The woman, Burial 4, was interred with grave goods that include a long flint blade, a bone awl, and a rounded stone. The man in Burial 5 had a small decorated tiered pot placed in both hands, positioned in front of his face, and a second pot close by. Two small tiered pots were also found in the grave of the man in Burial 6, as well as three small carinated bowls and a small copper axe. Interestingly, both men had severe injuries to their skulls, evidence of a violent end to their lives.

In 2012, 18 more graves, all dating to the Late Chalcolithic period, were investigated, and the remains of 25 individuals recovered. Two of the graves are secondary burials, with the incomplete disarticulated remains reburied sometime in Antiquity. So far, 20 complete skeletons have undergone preliminary analysis: ten adults, and ten children. One burial pit contained the remains of a woman who was in her 30s when she died, with two young children aged between four and five years old. One child was laid behind her, the other had been placed across her feet.

Some individuals had enjoyed comparatively long and healthy lives; one woman was more than 50 years old when she died, another adult had reached his late 40s. All the bodies were buried in a crouched – or flexed – position but with no clear preference for the direction in which they were placed. All but five of the burials contained grave goods. These finds include three copper pins and two other copper artefacts, but more usually flint and bone, ceramic pots, mussel and snail shells, Spondylus beads and other beads. Interestingly, traces of red ochre were found in the graves of two adult males and of another, as yet undetermined, adult.

One grave, still being excavated, contains the remains of at least six – possibly more – individuals who met a grisly end: at least three have damage to their skulls consistent with a blow from a sharp object. Were they cut down during an attempted raid? Or victims of an internal struggle? And why were they buried together in a collective grave?

We have to await further study for the answers, but we can assume that the inhabitants of Provdadia-Solntsata were no strangers to conflict: their heavy investment in the tell’s defences suggests they feared outside interference, and, given the value of their salt industry, probably with good cause.

Or could the violence have come from within, as the ‘have-nots’ rebelled against the ‘haves’? Certainly, we are witnessing the emergence of a highly organised population; overseeing the construction teams building the substantial defences would have required an established chain of command; while an economic and social hierarchy would have been key to the successful running of the salt-making process and related trade.

A prehistoric town?

Further excavation will give us a firmer idea as to the size and nature of the population living within the enclosed tell. So far, only two houses from the Copper Age have been excavated, one dating to the Middle, the other to the Late Chalcolithic. Both are two-storey structures. Prof. Nikolov explains: ‘I can only guess whether most houses had two levels, but in view of the cultural deposit – especially the late Chalcolithic layer – which is unusually thick for the Eastern Balkans, this is what I would suggest.’ If all the houses at Provdadia-Solntsata were one-storey high, he calculates that there would be about 400 residents; if all had two storeys, there would be about 800 people. The real number is probably between the two.

Tell Provdadia-Solntsata is a unique settlement in the Eastern Balkans. It functioned as a single entity: heavily fortified, with an associated industrial zone, and ritual areas that suggest an organised social hierarchy. These, Prof. Nikolov argues, are criteria that give it town status. If so, it would be the earliest yet recorded in this region. Whether the word ‘town’ or another term should be used for this settlement, its socio-economic structure was unlike any of its neighbours or, indeed, any other contemporary models. And, with its unique access to the region’s valuable salt reserves, Provdadia-Solntsata undoubtedly enjoyed both status and wealth. Perhaps it really is the source of the fabulous grave goods discovered at nearby Varna.