Guide to the Archaeological State Exhibition of North Rhine-Westphalia

REVOLUTION STEINZEIT

junge

The Impact of Neolithisation (5300-2000 BC)

REVOLUTION jungSTEINZEIT

ARCHÄOLOGISCHE
LANDESAUSSTELLUNG
NORDRHEIN-WESTFALEN

LVR-LandesMuseum Bonn
5.9.2015 - 3.4.2016

Lippisches Landesmuseum Detmold
2.7.2016 - 26.2.2017

**LWL-Museum für Archäologie,
Westfälisches Landesmuseum Herne**
3.6.2017 - 22.10.2017

Guide to the Archaeological State Exhibition of North Rhine-Westphalia – The Impact of Neolithisation (5300-2000 BC)

Text: Simon Matzerath
Translation: Michaela Butler
Layout: Jutta Holzhey, Lippisches Landesmuseum Detmold
Photography: Jürgen Vogel, LVR-LandesMuseum Bonn
Cover Illustration: Insight into a Settlement of the First Farmers
Illustrations: Mikko Kriek, Benoit Clarys

Detmold 2016

www.revolution-jungsteinzeit.de

This publication was realised with generous support of the NRW-Foundation (Nordrhein-Westfalen-Stiftung Naturschutz, Heimat- und Kulturpflege).

Introduction

This guide contains all text panels of the Archaeological State Exhibition of North Rhine-Westphalia, „Revolution Jungsteinzeit“ (Neolithic Revolution). They appear in the order they were encountered in the museum exhibition in the LVR-LandesMuseum Bonn (4.9.2015-3.4.2016). The texts are written for all visitors to the exhibition and therefore do not contain any references. Further reading and scientific background information can be found in Volume I of the exhibition catalogue:

T. Otten/J. Kunow/M. M. Rind/M. Trier (Hrsg.), Revolution Jungsteinzeit. Archäologische Landesausstellung Nordrhein-Westfalen. Schriften zur Bodendenkmalpflege in Nordrhein-Westfalen 11,1 (Darmstadt 2015).

In this Guide the German term “Jungsteinzeit” is used as a synonym for the Neolithic period and mostly referred to as “New Stone Age”.

The information panels of the second part of the Archaeological State Exhibition, wich is presented under the title „Forschungen – Funde – Methoden. Archäologie in NRW 2010–2015“, are not considered in this guide. They deal with subjects and new finds ranging from paleontology to the Second World War in North Rhine-Westphalia. Please see volume II of the exhibition catalogue listed in the bibliography on page 43.

The German audio guide to the full exhibition is available online at www.revolution-jungsteinzeit.de

Grateful thanks are due to Michael Schmauder, Jürgen Weiner and Erich Claßen for their discussions and support.

INTRO

The New Stone Age (Neolithic Period) – A Revolution for Mankind

Lender:
Koszta József Múzeum Szentes

Agriculture and livestock husbandry, a regulated water supply, solid houses and settlements: nowadays, we take this all for granted. At the same time, these inventions mean nothing less than the origin of our modern civilisation. They stand for the most radical change in the history of mankind, the transition from a hunter-gatherer way of life to a more settled farming existence. The origin of this evolution goes back to the Near East between Turkey, Israel and the Iran about 12,000 years ago. After the end of the Ice Age, people started to grow the first crops, to keep the first domestic livestock, and to revolutionise the storage of food. Only 7,300 years ago, the Neolithic lifestyle reached the region of today's North Rhine-Westphalia. The New Stone Age began long after the Neanderthals had died out and modern man had produced the famous cave paintings.
The Neolithic is marked by inventions such as mining, metallurgy, the plough, the wheel and pottery. In North Rhine-Westphalia it covers the period 5,300-2,000 BC.

Insight into a Settlement of the First Farmers

7,300 years ago, the first farmers arrived in the region of today's North Rhine-Westphalia. They created glades in the forest in order to build settlements; this is symbolised in the exhibition by the stumps of trees. A settlement usually consists of the typical longhouses. The reconstruction of the wall paintings, windows and dormers are based on assumptions. In front of the museum, there is a partial reconstruction of such a longhouse whose other end is outlined as a corner construction here in this room. Furthermore, a settlement consists of wells, cornfields and garden plots, such as illustrated here by the peas

and bluish flax. There are also cattle enclosures and hearths. Moreover, you can see goats, sheep, pigs, cattle and two dogs. In the middle of the picture, there are typical species of trees of this particular region that existed there during this period, i.e. little leave linden (“Winterlinde”) and oak. The forest mainly consisted of linden trees. The elm and the ash, however, were the typical trees of the floodplain. There was no grassland for grazing yet, so the cattle had to be fed natural resources provided by the forest. On the right side of the picture, you can see man-planted ash trees whose branches and leaves were regularly cut (pollarded) for the cattle’s food.

The First Crops

When the first farmers arrived in today’s North Rhine-Westphalia 7,300 years ago, they imported plants that were previously unknown in this region. As genetic studies show, these plants were cultivated in the Near East, in other words, man grew original wild

plants. Thus, they became more productive and robust. The first farmers in North Rhine-Westphalia had eight of these crops: pea, lentil, flax, poppy as well as cereals such as emmer and einkorn (one-grained wheat), and later brome grass and naked barley. Emmer and einkorn were both glume-wheat species. Contrary to our modern cereals, their grains were enclosed by an additional husk (glume) that had to be broken up before milling. The Neolithic farmers already baked bread with these cereals. Flax and poppy seeds provided oil. Clothes were made from fibre extracted from flax, that is, the flax plant provided the natural linen fibre used for the production of linen fabric.

Storage of Food for Survival

Preserving jars, tins, frozen food – all this did not exist in the New Stone Age. For the sedentary farmers and their animals, however, a well-functioning storage of food was essential to survive. In addition to the domestication and cultivation, it was the second pillar of the Neolithic concept of life. Grain used as food had to be stored

for winter, and as seeds for the next sowing. There were two possible solutions; the grain was either preserved in large clay vessels that were suspended by strings from the ceiling to be protected against vermin, or it was stored in a pit (silo). Experiments demonstrated that the grain-storage pits had great preservative effects. Only around the edge of the grain bulk, there was a thin layer of mould keeping parasites away, whereas the enclosed grain retained its high quality.

Wild Animals Become Tame – The Beginning of Livestock Husbandry

When the first farmers arrived in today's North Rhine-Westphalia 7,300 years ago, they imported not only different types of grain, lentils and peas but also animals. At that time, cattle, pigs, goats and sheep were already tamed (domesticated) and lived with humans who kept them as livestock. They provided meat and milk. Moreover, people used animal bones, sinews, skins and hides in many different ways. It is interesting to note that the sheep of that time did not provide any usable wool yet; the wool sheep as we know it today was bred later. Genetic analyses proved that the Neolithic domestic cattle originally came from the Near East. Thus, the aurochs native to the forests of Central Europe was not the predecessor of the domestic cattle and remained a wild animal being hunted. It is assumed that man even prevented its interbreeding with domestic cattle.
The domestication of the horse happened in the steppes of western Asia about 5,500 years ago. Since the late New Stone Age, it was used as a domestic animal in Central Europe.

A Chase after an Aurochs

According to the analyses of teeth and bones, this female aurochs was about 18 years old and died in autumn, approximately 11,400 years ago. In the Niersaue area, hunter-gatherers killed the animal, which offered an opulent meal, with arrows. Furthermore, hearths of the same date were found near the archaeological site at Mönchengladbach-Geneicken. After their hunting success, the hunters obviously camped on the site.
This is a fascinating and unique insight into the everyday life of indigenous hunter-gatherers, even before the first farmers arrived at our latitudes.

CONCEPTS OF LIFE

A Collision between Two Concepts of Life

Having our own house and starting a family are part of the usual lifestyle in our modern society. Nevertheless, even the personal decision to settle down or to travel around used to be part of the individual way of life. 7,300 years ago, two completely different concepts of life collided in the region of today's North Rhine-Westphalia. On the one hand, there were the indigenous people who lived in mobile tents and subsisted on hunting, fishing and gathering. On the other hand, there

were the first farmers who migrated into this region in order to build settlements with solid houses and massive water wells, to clear the forest, to set up fields and to raise livestock.

Hunter Versus Farmer

For centuries, the indigenous hunter-gatherers were in contact with the immigrated farmers. The coexistence of these two groups involved a collision of two fundamentally different

concepts of life during the New Stone Age. A similar situation occurred in the modern era when the Indians encountered the colonial powers that invaded their region.
The exhibition case is focused on the parts of a skull displayed on the left, which belonged to an ancient farmer and stock-raiser. To the right of it, there is a cranium (brain case) allocated to an indigenous hunter-gatherer. Despite genetic differences, both individuals were modern humans (Homo sapiens), and they were no less talented than people of today. In the New Stone Age, special knowledge other than the use of computer and mobile phones was required, such as handicraft skills and the knowledge of natural processes, the handling of animal and plant materials as well as the raw material of stone. Both hunter-gatherers and the early farmers were familiar with bow and arrow or antler picks. The latter, however, created entirely new tools and objects; among them were saddle querns for milling, clay vessels or adzes for felling trees.

What About Genetic Differences?

Genetics can reveal a lot of information about a single human being; this also includes the colour of the eyes or hair as well as predispositions to diseases.
If the genetic code of different people is similar, they can be grouped together. In this case, geneticists speak of 'haplogroups'. Thus, the hunter-gatherers and the first farmers, who lived more than 7,000 years ago, can be distinguished by their haplogroups. Recent studies have revealed that it took almost 1,500 years until the haplogroups of the hunter-gatherers intermingled with the haplogroups of the first farmers.

Isotope Evidence – Tell Me What You Eat and I Will Tell You What You Are

What did humans eat thousands of years ago? The answer can be provided by bones and teeth. Both of them have a composition of different isotopes. They can tell us, for example, whether people preferred fish or meat, or how much grain they were eating. Apart from the genetics, the isotope investigation can also show whether a Neolithic man spent his life as a farmer or hunter-gatherer.

People Came Together in North Rhine-Westphalia 7,300 Years Ago

Today, the cultural diversity in North Rhine-Westphalia is bigger than ever. People from the whole world live here together. About 7,000 years ago, there was the first contact of different groups in the Rhineland and Westphalia. Originally, indigenous hunter-gatherers had lived here for thousands of years. The first farmers to arrive in the Rhineland made their way from the region of modern Hungary through southern Germany. Moreover, the Neolithic lifestyle also spread from the south of France until it finally reached the Lower Rhine region and Westphalia; these people were nomadic pastoralists who introduced their domestic animals and pottery (La Hoguette Pottery). Apart from this, there is archaeological evidence of a fourth group consisting of hunter-gatherers who lived between the Meuse, Rhine and Scheldt rivers; they also adopted livestock farming and pottery production (Limburg Pottery) through their contact with the Neolithic farmers.

The Young Woman from the Blätterhöhle Cave

She did not get old; the young woman was between 17 and 22 years of age when she died. The cause of her death is unknown. She lived in Westphalia 5,600 years ago. Archaeologists found her skull in the Blätterhöhle cave near Hagen. It is one of the best-preserved skulls in North Rhine-Westphalia, which is dated to this particular time. For the Archaeological Exhibition of North Rhine-Westphalia, the young woman's face was reconstructed by means of forensic methods according to exact data. Scientific analyses (genetic and isotope investigation) proved that the young woman belongs to the group of the last hunter-gatherers in Europe – 2,000 years after the arrival of the

first farmers! This outcome induced a scientific sensation that was perceived by experts in the whole world. Obviously, hunter-gatherers continued to live in the low mountain range of the Eifel and Sauerland, whereas Neolithic farmers had already started to cultivate their fields in the loess region a long time ago.

The Last Hunter-Gatherers

What happened to the hunter-gatherers when the Neolithic farmers immigrated? There were certainly contacts and, to some extent, an exchange of goods and ideas between both groups. Was it a peaceful coexistence? Were members of one group integrated into the other one? There is little archaeological evidence to answer these questions. In the Rhineland and Westphalia, hunter-gatherers and farmers lived in different natural regions at the same time, whereas the North German Plain was, almost exclusively, the living space of hunter-gatherers until 4,000 BC. However, they already used pottery (Swifterbant Pottery). The archaeological site of Bokel Fenn near Oerlinghausen represents a habitation site of hunter-gatherers dating to this particular time;

it is assumed that early post-built houses already existed at this site. Did hunter-gatherers settle down here? In the fourth millennium BC, the hunter-gatherers' lifestyle finally vanished in Central Europe. Since then, the Neolithic has determined people's everyday life.

24 hours/a day in the life of hunter-gatherers, neolithic farmers and modern people (Germany).

CHANGE OF LANDSCAPE

Man Subjugates Nature

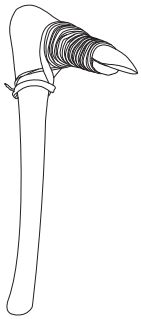
Landscapes are constantly changing, and they are shaped by roads and settlements. Entire regions disappear to make way for gravel and lignite exploitation. 7,300 years ago, a forest of linden trees and scattered oak trees covered large areas of the Rhineland and Westphalia. When the first farmers immigrated at that time, they felled trees in order to create glades. In the cleared parts of the forest, they set up areas of arable land, built houses and wells, and created space for their livestock. During the New Stone Age, man shaped nature for the first time; in other words, man subdued the earth, according to

the well-known quotation from the Bible (Genesis 1, 28). Since then, humans have left their trace on almost every single spot on earth. In Germany, there is no more square metre of primeval forest. Man has become the central, creative power on this planet. For this reason, the present geological era is called the 'Anthropocene'. Volcanic eruptions and tsunamis, however, show that this does not involve man's dominance over the forces of nature at all.

Axes – Tools for Working Wood

On the right, there are 94 adzes.

The most important Neolithic stone tool was the axe; it was essential for all kinds of woodwork. At the beginning of the New Stone Age, people only knew the adze – a tranchet axe of stone in which the edge of the blade is at right angles to the wooden haft. More than one thousand Neolithic adze blades have been found in North Rhine-Westphalia, most of which appear to be worn-out. The stone material the adze blades are made of is exclusive; it is extremely viscous rock that was imported from Jistebsko in North Bohemia over a distance of 600 km (373 miles), as many objects show. The wooden haft the adze was tied onto has hardly ever been found; there are only four recorded finds in the whole of Europe. The best-preserved haft was found in the 7,100-year-old well at Erkelenz-Kückhoven.



For the first time in the history of mankind, man exerted a destructive influence on the natural landscape.

Model of the Merzbachtal Valley – 7,000 Years Ago

In the background, there is the photo of an original linden forest in Poland.

The so-called “Aldenhovener Platte” is a region in the loess area of the Rhineland between the Inde, Rur and Wurm rivers. A complete settlement landscape of the first farmers was discovered here. The excavations, which mainly took place between 1965 and 1974, became famous on an international

level. The analysis of the pollen found in the archaeological layers allows a reconstruction of the landscape with scattered fields and farmsteads in the glades of a dense linden forest. According to recent investigations, it is improbable that the modern Merzbach brook already existed at that time.

First Environmental Destruction

Neolithic man cleared a part of the primeval forest, but what does it actually mean? For about 6,000 years, humans have also practised slash-and-burn agriculture in order to improve their harvest, even though the cleared areas used to be much smaller compared to the present deforestation in the rainforest regions. At the beginning, the Neolithic clearance had no significant impact on the balance of the environment - the initial effects were only marginal - but the final consequences were considerable. If the forest is cleared, the carbon stored in the tree is released. Especially when burning wood, carbon dioxide is released into the atmosphere. To the present day, man-made carbon dioxide emissions have increased to such an extent that they contribute to global warming. Moreover, fertile soil has been washed away by heavy rainfall (erosion) as a consequence of clearance and agriculture that has been intensified by the use of the plough since the fourth millennium BC. Anthropogenic (man-made) soil erosion, which has its origin in the New Stone Age, is a serious problem of modern agriculture; if fertile soil is washed away, the farmland will become unprofitable.

With 17.6 million inhabitants, North Rhine-Westphalia is Germany's most populous federal state. The majority of the people live in 29 big cities with more than 100,000 inhabitants. When the first farmers arrived here more than 7,000 years ago, they only occupied the zones to the north of the Eifel and Sauerland regions with their fertile loess soils. A large number of isolated farmsteads were built, but also small settlements consisting of up to ten houses. They all stand for the beginning of a landscape built-up by man and are regarded as predecessors of our modern villages and towns. 7,000 years ago, a maximum of 25,000 farmers lived in the loess areas of North Rhine-Westphalia.
The first farmers buried their dead in cemeteries near their settlements. The crouched burial of the dead in a tomb, with the legs bent and the arms folded up to the chin, reminds of a position of a sleeping person. Perhaps the Neolithic people believed that the deceased were fast asleep and might wake up again at some stage?

The Development from a Primeval Forest to a Cultural Landscape

This model schematically represents the development of a settlement of the first farmers in five phases (around 250 years in real time). It shows how man began to create the landscape more than 7,000 years ago. In the original forest (phase 1) a glade is created in order to build a farmstead with well, cattle enclosure and corn fields (phase 2, about 5,300 BC). In phase 3, the settlement is getting bigger and garden plots with flax,

poppies, peas and lentils are set up. One part of the fields is enclosed by a palisade. At the edge of the forest, bushes and shrubs are growing, especially hazel. The settlement is finally enclosed by a ditch and bank (phase 4). Several fields are lying fallow, and the houses are falling into decay or are being built. The surrounding is largely deforested. The growth of the settlement results in an extension of the cemetery (illustrated here by a few graves). In phase 5, the settlement is abandoned and nature is taking the area back.

Köln-Lindenthal – A Pioneer Site of the Archaeological Settlement Research

86 years ago, an excavation started in Köln-Lindenthal, which attracted attention all over the world. The reports on this event spread in the newspapers and on the radio, even to the United States. It is a more than 7,000-year-old settlement of the first farmers. Between 1930 and 1934, this settlement was almost completely excavated. In 1936, all the results and a detailed excavation plan were published. The analysis included all relevant methods of that time and involved all disciplines, from geology to botany. Up to this day, the reconstructions of the longhouses at Lindenthal, which are accompanied by a structural engineer, have been part of the scientific discussion on the Neolithic house building. The finds and the documentation of the excavation, for the most part, survived the Second World War in Cologne in spite of bombing. From the estate of the deceased excavator, Werner Buttler, important documents were kindly provided by his children.

What Does the 'Artist' Want to Tell Us?

In the settlement at Köln-Lindenthal, the archaeologists unearthed more than 10,000 finds. In most cases, it was possible to allocate the objects and fragments. Some finds, however, remain extremely puzzling, like the sherd illustrating a face and the fragment of a hollow figure, for example. What did these objects stand for? What did the 'artist' think of when he or she created them? Was the illustrated face just a decoration or did it have a 'ritual' background? Perhaps the vessel had a special function. As for the fragment of the hollow figure, a comparative research lead to the assumption that it might belong to a clay vessel modelled as a taurus showing its genitals. On the left side of the exhibition case, there is a reconstruction remodelled in 2015.

Large Houses - For What Purpose?

The first houses in Central Europe were constructed by immigrated farmers more than 7,000 years ago. The biggest Neolithic house in North Rhine-Westphalia so far, which was found in Bochum-Hiltrop, was 65 metres long. The living space usually amounted to more than 100 square metres, in exceptional cases even more than 300 square metres, although it is estimated that only around ten people might have lived in one house. Food was stored in the houses and it is assumed that the cattle stayed under the same roof in winter. When a house was built, skilled craftsmen worked together for several weeks. For a medium-sized longhouse, approximately 50 to 70 cubic metres of oak wood had to be transported to the building site. The alignment of the longhouses constitutes a phenomenon; in Central Europe, most of the nearly 2,000 house structures known from the time of the first farmers were more or less orientated north-west to south-east.

No Dreariness in the Stone Age

The first houses in Central Europe were post-built houses constructed from oak wood. The wall wattling consisted of hazel and willow rods (wicker) woven together and covered with clay. Evidence did not survive apart from post-holes in the

ground and isolated parts of clay walls known as daub (fire-baked and hardened clay). The other parts of the house can only be speculated upon, such as the existence of doors and windows (without a window-pane) or dormers in the roof (used as smoke holes).
Nevertheless, excavations on archaeological sites with extraordinarily good preservation conditions revealed, among other things, the use of lime plaster for wall coverings. It is assumed that the walls were painted in different colours such as raddle (red ochre pigments). There are unique finds from Saxony-Anhalt that illustrate the plastic decoration, which probably adorned most of the Neolithic houses.

Journey to the Afterlife – The Graves of Arnoldsweiler

It was an archaeological sensation when preserved skeletons of the first farmers were found in a cemetery in 2009 and 2010. So it was possible to investigate 229 graves and, consequently, one of the biggest cemeteries of the first farmers in Central Europe. The skeletons of the dead offer a unique insight into the burial rites and the personal destinies. In all the graves, the deceased were buried facing east or south, with the legs bent. An exception to the rule is the tomb of a man who suffered under the rare Bechterew's disease. Due to this disease, his joints were extremely ossified. For this reason, it was not

possible to bury him in the typical crouched position. Here are photogrammetric images of five graves from Arnoldsweiler. This technique provides a three-dimensional view of the graves on the computer. In the second photo from the left, a baby was buried beside a woman.

LINEAR POTTERY

Central Europe under the Influence of the Linear Pottery Ornament

In our modern society, people strive for individuality. There are also products such as clothes, soft drinks or smartphones whose trade marks are present almost all over the world. Most

of them, however, are only up-to-date for a short period of time. In the New Stone Age, it was quite different. Between Hungary and the Paris Basin, there was a phenomenon that obviously unified the people in this region for more than 600 years. It refers to ribbons of parallel lines, an ornament on pottery, which was the common feature of the first farmers between 5,500 and 4,900 BC. Although there were many different variations of this particular ornament, it seemed to be the obligatory part of pottery decoration in each settlement and cemetery. The map shows the distribution of this Linienbandkeramik (Linear Pottery). It was originally produced in Hungary. With the first farmers, the idea of the Linienbandkeramik spread to Central Europe and beyond. In this huge area, people standardised not only the pottery but also the alignment of the houses and the position of the dead in a tomb. Obviously, there must have been a profound conviction that explains the willingness to adapt these standards for so many centuries.

Not Only Sherds – Ceramics as High-Tech Products

The Neolithic people were technically very experienced and skilled. Once again, it can be proved from pottery production. Here you can see the skills that surpass all previous descriptions. Broken and subsequently repaired ceramic vessels, for example, are known from archaeological sites in Saxony. They were mended with birch pitch, the adhesive of the Stone Age. The outside of a vessel from Saxony, which is shown here in the computer animation, is completely covered with birch pitch. Cut-out triangles of birch bark are stuck onto

the pitch. Thus, they covered a former fracture; this procedure, however, has not been proved in an experiment yet. The vessels obviously had a special, sentimental value for man. Preserved Neolithic wooden vessels like the one from the well of Erkelenz-Kückhoven are extremely rare, but they certainly existed in a large number.

Food in the New Stone Age

The following sorts of food already existed at the beginning of the New Stone Age: hazelnut, beechnut, sorrel, barley, nettle, brome grass, fat-hen (white goosefoot), clover, knotgrass, common elder, animal blood, water nut, meat, emmer (and a husk, next to it), honeycomb (honey), dry cheese, poppy, bread, mushrooms, cornelian cherry, linseeds, edible snail, mussels, fennel, celery, beam-tree berry, lantern plant, rose hip, crab apple, lentil, pea, acorns, blackberry, strawberry, raspberry, sloe berry, bird's eggs, salt, einkorn (one-grained wheat), fish and linseed oil.
The mud turtle, other sorts of wild herbs and berries, other plants (chickweed, wild carrot among others) and cottage cheese are not included in this picture.

From Grain to Bread

Our bread mainly consists of common wheat and rye. At the beginning of the New Stone Age, emmer and einkorn wheat

were used to make bread. They were both glume-wheat species, that is, contrary to our common wheat and rye, their grains were enclosed by a glume (husk) and had to be broken up before milling. For this process, a wooden mortar was utilised.
After the cereals had been harvested by means of a sickle, the grains had to be released from the head by threshing. Then the glume was broken up and blown out by the wind. In order to produce the flour, the grain had to be grinded on a saddle quern. Finally, the bread was baked in a cupola-style furnace or earth oven. The evidence of Neolithic bread was provided by a loaf discovered in Switzerland.

Dairy Farming and Lactose Intolerance

With the domestication of cattle, goats and sheep, the first farmers had three animals providing milk. Today, a German citizen consumes nearly 100kg of fresh milk or fresh dairy products per year. In the New Stone Age, such an amount was totally inconceivable. Genetic research proved that the majority of the first farmers were lactose intolerant, in other words, they could not digest the sugar in cow's milk. This led to flatulence and diarrhoea. Only when milk was processed into cheese, the milk sugar was naturally reduced and became easily digestible. Cheese strainers with remains of milk fat reveal cheese production in the Early Neolithic Period. When the milk was poured into the strainer, the whey (the watery part of milk), and consequently a large quantity of milk sugar, dropped through the sieve.

„Slot Machine“: Here, visitors can try their luck as Neolithic farmers.

Cool, Clear, Tasty – Water Supply in the New Stone Age

The access to clean drinking water is not only essential to the growing world population of the present. While the Stone Age hunter-gatherers chose the location of their campsites with regard to an easy access to water, the sedentary farmers had to find new solutions. Only in the last 25 years, there has been growing evidence that water was not withdrawn from surface waters during the New Stone Age. Instead, it points to the assumption that drinking water and domestic water were provided by water wells with a standardised construction. This idea becomes even more persuasive since it has been proved by scientific methods that a large number of brooks in the loess areas of the Lower Rhine region, which are known to us today, did not exist 7,000 years ago. There might have been a well in each settlement of the first farmers. These wells were also used as watering places for livestock, for washing, and certainly to water the gardens and fields. The Neolithic well construction could reach monumental proportions. With a total of 15 metres, the well of Merzenich-Morschenich represents the deepest Neolithic well ever found.

A Large Construction – The Well of Erkelenz-Kückhoven

The well of Erkelenz-Kückhoven was completely excavated in 1991 and 1992. It belonged to a settlement of the first farmers who utilised ceramic vessels decorated with the typical ribbons of parallel lines (Linear Pottery). The well was 13 metres deep. For the construction pit of the well alone, 560 cubic metres of earth were dug out by means of wooden tools (spade and pick). This is equivalent to 56 full truckloads that were distributed as spoil outside the pit. The well consists of three square box frames (i.e. well lining) built in the ‘blockhouse’ method (logging technique). With a lateral length of 2.80 metres, the oldest box frame is also the biggest. It was made from eleven tons of oak wood (split planks). The two other box frames were built in when the first box frame was damaged on one side, which was caused by sediment pressure, and could not be repaired any more. The whole structure of the well is a perfectly matched construction that presents a brilliant technical achievement.

How Old Are the Wells?

The dendrochronology, literally translated as “science of age of wood”, is a scientific method of dating wood according to the pattern of its growth. It is based on the tree rings representing the annual growth of a tree between spring and autumn. The

pattern of thick and thin rings depends on climatic conditions. By measuring the ring width, the patterns of rings between several trees can be compared and matched. Due to an analysis of thousands of wood samples, an almost continuing chronology of the annual tree-ring growth covering 12,000 years could be established. With this method, the first wells in Central Europe are datable to a particular year. The oak trees utilised for the oldest and biggest box frame of the well at Erkelenz-Kückhoven were hence felled in autumn 5,090 BC and immediately used for the construction of the well. The two smaller and inner box frames, however, were felled by 5,060 BC and used for a repair.

Outstanding Archaeological Finds

In human history, the epochs from the long-distant past are referred to as Stone Age because mainly stones survived from that time. In fact, man-made objects and tools consisting of organic materials, i.e. animals and plants, marked the everyday life of the people. In the more than 7,000-year-old well of Erkelenz-Kückhoven, organic objects were preserved in ground water. The water prevented contact with oxygen and, therefore, the deterioration of wood, bark and bast. This fortunate circumstance provides an insight into the everyday life of the early farmers never considered before. The bags, which were used to draw water from the well, consist of thin bark. Furthermore, they have reinforced corners elaborately spun around by plaited cords. There is also a round sieve with a sort

of ‘stitched cloth’ made of twisted fibres (linden bark/linden bast). Particularly noteworthy is the unique amber find (Baltic amber) of the Linear Pottery Period, a pendant with two holes. Some fragments of a bow staff and the remains of arrow shafts survived among others.

MINING

Mining – A Stone Age Invention

Mining has always played an important role in North Rhine-Westphalia. Lignite and hard coal have been the major energy sources up to this day. In fact, it is no coincidence that the Ruhr District and its steel industry developed right here. There is evidence that mining already existed in pre-Neolithic times. During the New Stone Age, it experienced a massive boom. The ‘steel’ of the Stone Age was certainly the flint stone, but coarse-textured and solid rocks were also mined (the former, for example,

Here you can see the Neolithic underground flint mining in Cissbury (England).

In the showcase: stone materials (and artifacts) that were used in the Rhineland and Westphalia in the Neolithic period. The map shows Neolithic mines. Named are those from which stone raw material came to the Rhineland and Westphalia in the Neolithic.

were used for the production of saddle querns). It is assumed that rock salt was exploited, too. Around 250 Neolithic mining sites are documented in Europe. They revealed open-cast pits, but also deep shafts that were partly linked with underground galleries. Since the early days of the New Stone Age, man set a high standard of stones as raw material. Mining was the task of specialists who stayed at the deposit for several weeks. In North Rhine-Westphalia, there is only one flint deposit of great significance, the Lousberg hill in Aachen. During the Neolithic period, flint stones extracted from the mines located in the area of modern Belgium and in the southern Netherlands were particularly important for the region of North Rhine-Westphalia.

The Flint Mining Site on the Lousberg Hill – The Oldest Industrial Monument in North Rhine-Westphalia

On the Lousberg hill in Aachen, a more than 65-million-year-old marine lime deposition was preserved. It included more than 20 layers of flint stone; most of them were up to four centimetres thick and broken into small pieces. During the New Stone Age, especially in the second half of the fourth millennium BC, there was intensive flint exploitation on the Lousberg hill. First of all, the limestone was crushed by means of a hammerstone. Then the flint was quarried using antler tools (antler picks). In most cases, the pieces of tabular flint had been broken up on the site, either starting from the corners or from the lateral edges, before they were precisely struck to achieve a roughout, an unfinished preform for an axe blade. According to calculations, at least 300,000 roughouts made of Lousberg flint were produced for axe blades. There is evidence that they were distributed far into Westphalia. Once the unfinished objects reached their destination, they were polished for the use as axe blades that were needed for woodwork.

The New Stone Age – An Era of Changes within 3,000 Years

In Central Europe, the New Stone Age lasted around 3,000 years, which is longer than any other succeeding epoch to the present day. In this gallery, the development of the landscape, pottery production and burial rites are presented as examples of the numerous changes that marked the Neolithic period. In the early years of the New Stone Age in the Rhineland and in Westphalia, the dead were individually buried in flat graves. This burial rite changed 5,500 years ago. At that time, the members of a community built large above-ground burial chambers that provided space for more than one hundred people. By the end of the New Stone Age, the individual became more important, which is demonstrated by individual burials under round mounds.
Nearby, you see the grave 4953 of Düren-Arnoldsweiler, which is preserved in a soil block. In the media, this skeleton became known as ‘Lilith’. It is a typical crouched position burial in a flat grave. Age: approximately 7,100 years.

The Burial Chamber of Schmerlecke

In the New Stone Age 5,500 years ago, the dead of a local community or family were all buried in the same tomb. In Schmerlecke, in the district of Soest, two burial chambers of such a community were excavated; each of them had more

than 300 individuals. The 'Burial Chamber II' is in the focus of this exhibition. It has a length of more than 20 metres. As limestone slabs were used for the construction of the burial chamber, the chemical conditions for the preservation of the skeletons were favourable. Thus, the skeletons provide a lot of information about the individual fates.
Almost every second individual in the tomb was buried with a set for making fire. The chambered tomb was used for burials throughout the centuries. The skeletons were pushed aside in order to create space for new bodies. Between the skeletons, there was a raised strip of earth for the living to walk through the chamber.

Taking a Closer Look at the Afterlife – Individual Burials under Mounds

The third millennium BC was marked by a high mobility of several groups of people in Europe. The fact that the horse was being domesticated was not the only reason. People

migrated from the Iberian Peninsula, i.e. Spain and Portugal, and spread across the Rhine. Grave goods such as arrowheads and wristguards are characteristic belongings of an archer. From East Europe, another group of people made their way to the region of North Rhine-Westphalia. Both groups can be distinguished archaeologically and, meanwhile, also genetically. They buried their dead individually, in some cases under burial mounds. One group interred their deceased in a grave with the face to the south, whereas the other one buried them with the face to the east. Typical for both are pottery drinking vessels in the form of large beakers. The group immigrated from the south-west had bell-shaped beakers ("Bell Beaker Culture"), and the other one from the east had beakers with impressed cord ornament (Corded Ware).

A Great Diversity – The Pottery of the New Stone Age

During the Neolithic period, there were more than ten different groups of pottery in North Rhine-Westphalia. They all had their typical vessel shapes and ornamentation. Each pottery group only existed in a certain distribution area at a certain time. Here you can see well-preserved Neolithic ceramic vessels, which are classified according to pottery groups (types) and dating:
In the exhibition case (top left), there are the first pottery objects from the region of North Rhine-Westphalia (Linear Pottery). The last exhibition case shows the latest vessels

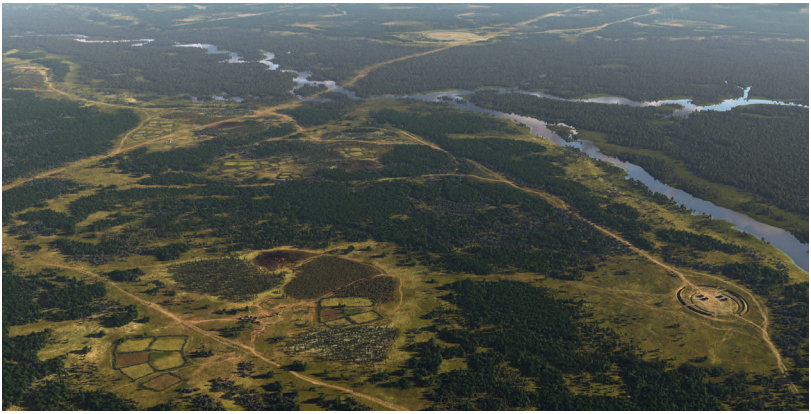
(Giant Beakers) of the Neolithic. All vessels were still hand-made without using a rotating potter's wheel. Once the pots had dried, they were fired in a bonfire. A bone implement, for example, could have been used for the decoration.

First Settlements in the Landscape

This is what the landscape between Aachen and Cologne probably looked like more than 7,000 years ago. Your gaze is wandering over the loess region and the Rurtal valley at the time of the Linear Pottery Period. The first farmers have settled down. Before, they had cleared several parts of the linden forest in the originally closed woodland in order to build their settlements and to set up their fields. You can see houses with the typical northwest-southeast alignment, but also gardens, cattle kraals and wells. To the right, there is a settlement enclosed by a ditch and a bank, a so-called earthwork enclosure. However, the settlements were not located in the floodplain of the Rur river.

A Changing Landscape

By 3,800 BC, the landscape was considerably changed. Here you are looking north-east over the Indetal and Rurtal valleys. The landscape consisted of several small settlements. There is no evidence of houses of that time, which leads to the assumption that people did not construct post-built houses whose posts were put deep into the ground. Thus, the houses here were reconstructed according to comparable archaeological sites



in southern Germany. The surroundings of the settlement illustrate slash-and-burn agriculture with cleared and afforested areas. Livestock farming also played an important role at that time. Furthermore, you can see the earthwork enclosures; these monuments consist of one or more parallel ditches and banks. In the foreground to the right, there is the earthwork of Inden. In the background to the middle, you can see the earthwork of Jülich, which is still under construction. On the left side of the picture, there is the earthwork of Koslar already falling in decay. The function of these large monuments, whose entire diameter sometimes exceeded 800 metres, is still unknown. Can they be regarded as market places, ceremonial sites, meeting places, or did they provide shelter for the surrounding settlements?
Next to the picture, there are modern aerial photographs showing four big enclosures of that time.

A Big Question – The Reconstruction of the Landscape at the End of the Neolithic Period

Our current knowledge is not sufficient to reconstruct a model of a Late Neolithic settlement because no settlements from the third millennium BC have ever been excavated in North Rhine-Westphalia. Nevertheless, burial mounds and finds proved that people settled here in those days. Drill cores in the valleys of the Wurm river and Elsbach, both situated in the Rhineland, provided data about the landscape of that time. Accordingly, hazelnut and oak trees were dominant, whereas linden and elm trees nearly disappeared. Neolithic slash-and-burn agriculture fundamentally changed the landscape. In addition, intensive

livestock farming lead to an increased use of the meadows in the area of the flood plain. Agriculture was not so important any more. During the New Stone Age, farming was sometimes replaced by nomadic pastoralism.

Did Peace and Equality Exist in the New Stone Age?

Extraordinary big adzes and axes from the early Neolithic.

As long as the access to resources, such as stone material, salt or fertile land, was not limited, there was hardly any reason for violent conflicts. However, the graves of individuals and even whole communities show that people were also killed through violence.

Who was the leader in a Neolithic community? As for the Neolithic graves, there were no individuals who distinguished themselves by a special tomb or an excessive amount of grave goods; all the people were buried more or less in the same way. By the end of the New Stone Age, however, burial mounds were constructed as special tombs for individuals.

And what about precious and outstanding objects? In the Neolithic period, huge adze blades, jadeite axe blades or the first copper objects represented a high material and, probably, social value. They either belonged to a local community or an individual who might have played an important role within the community.

Jadeite – An Import Hit from the Alps

Today, products from the whole world can be ordered on the internet. Many everyday objects, including food, are not produced in Germany, but they are always available. For Neolithic man, it was not always possible to go and get some desired exclusive goods within a few days. Therefore, they had to be acquired by bartering. This included salt, but also a very viscous, greenish stone quarried in a small area in the Ligurian Alps in North Italy, the jadeite. Nearly 40 cm-long jadeite axe blades were found in North Rhine-Westphalia. Some of these oversized axe blades were very thin, making them definitely unsuitable for work. Their material and size indicate that they had a special significance for man. Between 4,600 and 3,800 BC, the magnificent jadeite axe blades spread from the Alps even up to Scotland. Until quite recently, people produced similar splendid axe blades in New Guinea. Some of these people believe that there are the souls of their ancestors inherent in these axes.

Copper – The New Raw Material of the Stone Age

Well-preserved mines in Serbia and Bulgaria provided evidence that the exploitation of copper began 7,000 years ago. As a raw material, copper was quite popular because it could be formed easier than stone. In East Europe, big axes were therefore made

of copper. The distribution of these heavy copper implements was a phenomenon of the New Stone Age. When the first copper tools appeared in large parts of East Europe in the fifth millennium BC, there was no demand for them in Central and West Europe. Instead, there were a large number of jadeite axe blades. Early copper finds, dating back to the fourth millennium BC, are known from Westphalia. Among them are, above all, imported axe blades and jewellery. So far, there has been no evidence of local copper processing. The exhibition case also shows stone axes trying to imitate metal objects, which can be clearly recognised by the imitated casting seam. This could reveal a high esteem for copper as a rare raw material.

The Bronze Technology Follows the Stone Age

A few decades ago, we had rotary dial telephones with finger wheels.
In the modern digital world, there are mobile phones and smartphones. It is true that these innovations have changed our everyday life, but we are (still) the same people. The invention of the bronze technology should be regarded in the same way, that is, it heralded a new era, but the beginning of the Bronze Age was still marked by the New Stone Age. From circa 2,000 BC, the more solid and therefore unbreakable bronze objects slowly started to appear in the region of North Rhine-Westphalia. Bronze is, in fact, a further development of the copper metallurgy; the only but vital difference is the addition of ideally ten percent of tin (alloy). Gold, too, was a raw material of the Bronze Age.
The gold cup from Fritzdorf is a representative example of the Bronze Age. This extraordinary object is 3,700 years old, weighs 221g, and was hammered in one piece. Similar finds of this time are known from the Greek Mediterranean area and South England.

End of the Neolithic part in the Archaeological State Exhibition of North Rhine-Westphalia. A modern tractor wheel; opposite you can see the coloured 3D printing of a wooden wheel with a shaft from Ljubljana (Slovenia).

This stone (copy) with symbols of bulls was excavated in Warburg (Westphalia).

The „interactive area“ combines elements of both parts of the exhibition.

Second exhibition area: here the view into the room with finds from different eras (Metal Ages to the 20th century).

Bibliography:

S. Haupt/S. Matzerath/M. Schmauder, Die ältesten Häuser Mitteleuropas - Teilrekonstruktion eines frühneolithischen Langhauses. Archäologie im Rheinland 2015 (im Druck).
S. Matzerath/Th. Otten/M. Schmauder, Neolithikum und Gegenwart - Anknüpfungspunkte in der Archäologischen Landesausstellung NRW „Revolution jungSteinzeit“. Blickpunkt Archäologie 4/2015, 298-306.
S. Matzerath, Dokumentation der Archäologischen Landesausstellung NRW „Revolution jungSteinzeit“. Projektskizze, Ausstellungskonzeption und Publikation. Berichte aus dem LVR-LandesMuseum Bonn 2/2015, 2-11.
S. Matzerath, Die Landesausstellung zieht weiter... Ein fotografischer Rückblick aus Bonn. Berichte aus dem LVR-LandesMuseum Bonn 1/2016 (im Druck).
T. Otten/J. Kunow/M. M. Rind/M. Trier (Hrsg.), Revolution Jungsteinzeit. Archäologische Landesausstellung Nordrhein-Westfalen. Schriften zur Bodendenkmalpflege in Nordrhein-Westfalen 11,1 (Darmstadt 2015).
T. Otten/J. Kunow/M. M. Rind/M. Trier (Hrsg.), Archäologie in NRW 2010-2015. Forschungen - Funde - Methoden. Archäologische Landesausstellung Nordrhein-Westfalen. Schriften zur Bodendenkmalpflege in Nordrhein-Westfalen 11,2 (Darmstadt 2015).
J. Weiner, Ein bemerkenswerter Großschleifstein für Steinbeilklingen. Berichte aus dem LVR-LandesMuseum Bonn 01/2015, 10-15.