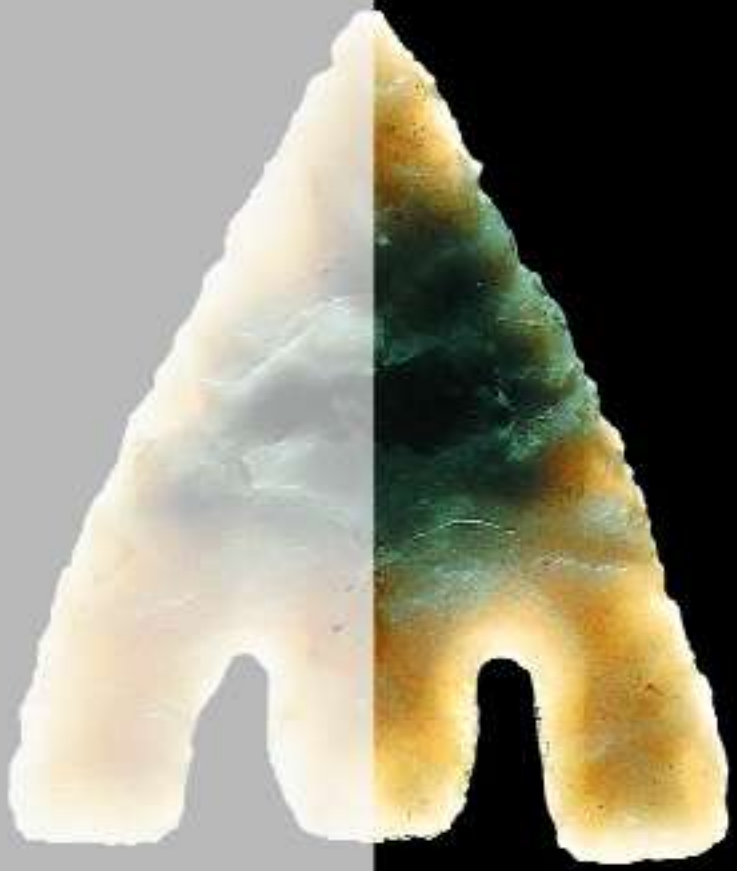

MNHA

Prehistory Period (floor -5)

English translation
of the exhibition texts

Prehistory Period (floor -5)

English translation of the exhibition texts

Translation: Lorraine CAMPBELL
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MNHA Musée national d'histoire et d'art Luxembourg

Luxemburg 2005

(Qu'est-ce que la Préhistoire?)

What is prehistory?

What is prehistory?
Prehistory - literally 'before' history - refers to the period of human history that spans the very early stages of mankind's development from the origins of man through to the appearance of written records. In Europe, prehistory covers a vast time period of nearly a million years which is divided into three main eras:

the Palaeolithic: (1 000 000 to 10 000 years BC),

the Mesolithic: (10 000 to 5 000 years BC)

the Neolithic: (5 000 to 2 500 years BC).

The end of the prehistoric period and the transition to protohistoric period (exhibited on Level - 4) is marked by the appearance of the first tools made from metal (copper and gold) and the appearance of the first written texts (cuneiform tablets) at approximately 2 500 years BC. As there are no written records for that period, prehistorians study 'soil archives' by carrying out painstaking archaeological excavations in order to piece together a picture of the various evolutionary stages of mankind and his natural environment (plant, animal and mineral). During their research, prehistorians attempt to pinpoint the changes in early man's way of life; first as a predator, then a nomadic hunter and gatherer (Palaeolithic, Mesolithic), and finally a sedentary farmer and pastoralist (Neolithic). The discipline of prehistory essentially involves the study of relics (made from stone, bone, baked clay, wood, etc.) dug up during archaeological excavations. These relics are often extremely fragile and provide us with the most conclusive evidence of human activities (dwellings, burial places, etc.). Since time immemorial, man - an animal endowed with self-consciousness - has contemplated his place in the universe, his origins and his destiny. The history of the life of our prehistoric ancestors can provide us with some answers to the following key questions: Who are we? Where do we come from? Where are we going? A better understanding of our history helps us gain a greater appreciation of the past and enables us to make better predictions about the future …

(L'animal humain : à quelle famille appartenons-nous?)

The human species: Which family do we belong to?

Microche? (M. Eberle / www.phocus.org)

Mandrill (S. Osolinski / Oxford Scientific films.)

Kapuzineräffchen (D. Middleton / NHPA)

Gibbon (E. Janes / Nature Photographers Ltd.)

Orang-Utan (M. Bowler / NHPA)

PROSIMIENS

SIMIENS

Singes du nouveau monde

Simiens de l'ancien monde

Singes de l'ancien monde

Grands singes

Mandible of Plesiadapsis

The human species: which family do we belong to? An accidental origin of life. In the world of living beings, man belongs to the class of mammals more specifically known as the order of primates, made up of nearly 230 tropical species belonging to approximately 15 families. The common ancestor of the primates is the "Altiatlasius Koulchii", which is believed to have lived between 58 and 55 million years ago, a period when the last dinosaurs were facing extinction. Then appeared the Adapids and the Prosmians, and later the Simians, this species being divided into two subgroups:

Mensch
(G. Hoffmann)

Gorilla
(D. Cox / Oxford Scientific films)

Bonobo
(M. Colbeck / Oxford Scientific films)

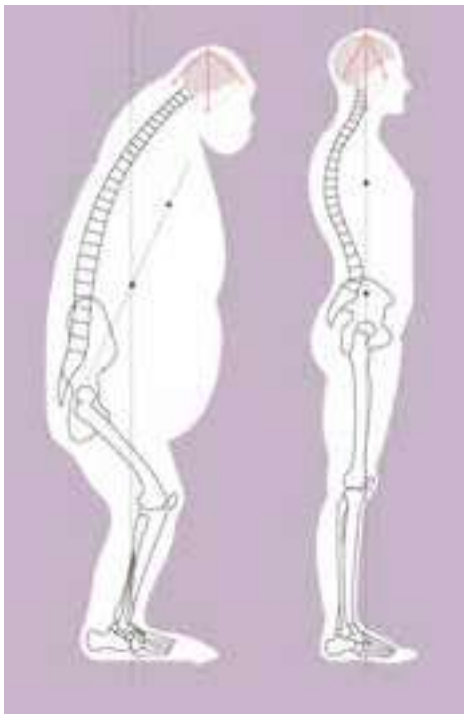
Chimpanse
(N-J. Dennis/NHPA)

New World Primates, or Platyrrhini (which means ‘flat noses’), and Old World Primates, or Catarrhini (which means ‘round noses’). The latter sub-order includes the Pongidae (group of large apes: chimpanzees, gorillas, gibbons and orang-utans) and the Hominidae (humans). As they had a common ancestor that lived approximately 5 to 10 million years ago, the human being can be considered as a third species of chimpanzee alongside our cousins, the Pan troglodytes (common chimpanzee) and Pan paniscus (bonobo, or pygmy chimpanzee), with 99 % of chromosomes closely resembling each other. Humans are distinguished from other animals by their sustained upright posture and bipedal (two-footed) gait, omnivorous diet, social interaction, use of language and tool-making skills.

(Origine et évolution de l'homme)

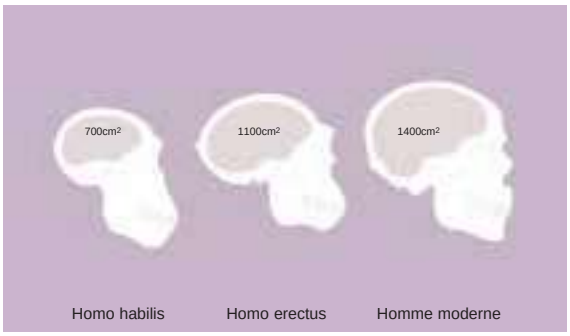
Origin and evolution of mankind

Origin and evolution of mankind. Africa is widely regarded as the 'cradle of humanity'. The oldest fossilised human bones have been found on the African continent, in particular along its eastern side, stretching from the Great Rift Valley down into South Africa. The last hominid discovered in 2001 was dubbed 'Millenium Man', or Orrorin tugenensis. His age was estimated at 6 million years. Among the different types of australopithecine discovered is 'Lucy' (Australopithecus afarensis), believed to be approximately 3.5 million years old. The first members of the genus Homo - Homo habilis - appeared approximately 2.5 million years ago. They were probably the first hominids to fashion tools from stone. More than a million years ago, Homo erectus moved out of Africa and eventually spread into Europe (Homo heidelbergensis). He built the first dwellings and mastered the use of fire approximately 500 000 years ago. Neanderthal man (Homo sapiens neandertalensis) was the first hominid to bury his dead. Approximately 35 000 years ago, the first Homo sapiens sapiens moved into other parts of the world. The distinguishing features of modern prehistoric man include the use of various forms of artistic expression and the ability to invent tools to help in the search for food. One of the most significant early developments was the invention of a cutting tool and the ability to fashion it at will.

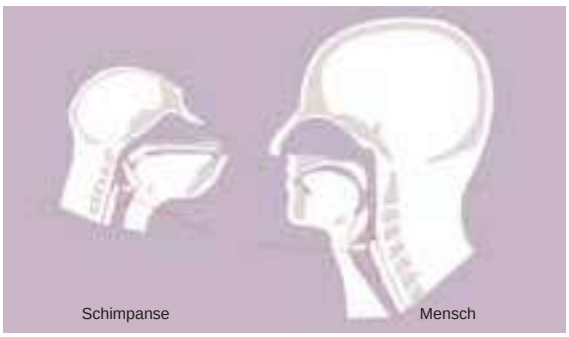


Differences between the gorilla and man. The large apes have very long forelimbs and their way of getting from place to place is perfectly suited to life in the trees. Their skeleton is organised around a poorly balanced spinal column resting on a long, narrow pelvis, making it impossible to remain standing upright for long periods of time. They rarely adopt an upright posture and only occasionally walk on just their two hind legs. In humans, the occipital hole where the spinal column enters the skull is located next to the base of the skull; in apes, the hole is further back, at an oblique angle to the horizontal, throwing the whole weight of the head forwards. Bipedalism resulted in a major alteration to the skeleton of hominids. The pelvis became short and wide. The spinal column developed a double curvature enabling more efficient weight distribution. At the same time, the position of the occipital hole near the base of the skull encouraged the development of intellectual capacities and allowed the head to be perfectly balanced. The feet became better adapted to walking and the hands to grasping.

Throughout man's early evolution, he constantly broke new ground and underwent major technical revolutions, often involving the application of extremely complex concepts. Thanks to his intellectual capacity, his methods of communication, his ability to gain knowledge through learning and his psychomotor skills, he was able to make use of the natural resources in his environment and gradually spread across all the continents of the world. The acquisition and sharing of experiences also enabled groups of humans to predict their needs, plan their actions and movements, organise their activities and structure their environment into both living space (encampment) and habitually used areas (territory). Man moved on to greater heights as he became aware of the passing of time and of his own identity. From then on, man was only one step away from addressing that metaphysical question: What is man's place in the universe? Today, mankind has begun venturing beyond his natural habitat by flying to the moon and exploring other planets and galaxies. Man has the ability to exert a strong influence on the ecological changes in his environment, thereby upsetting nature's fragile balance; consequently, his destiny and that of the environment in which he continues to evolve are in his hands. Out of aware-ness of the importance of this responsibility for the future of the planet and of the human species, humanity must ensure the continuation of this legacy for future generations.



Evolution of cranial capacity in hominids.



Language. The speech organs (vocal chords and larynx) that enable articulated speech are lower down in the larynx in humans than in chimpanzees. This results in the creation of a larger 'resonance chamber' which enables a greater range of phonemes (sounds) to be produced during the expulsion of air from the mouth.

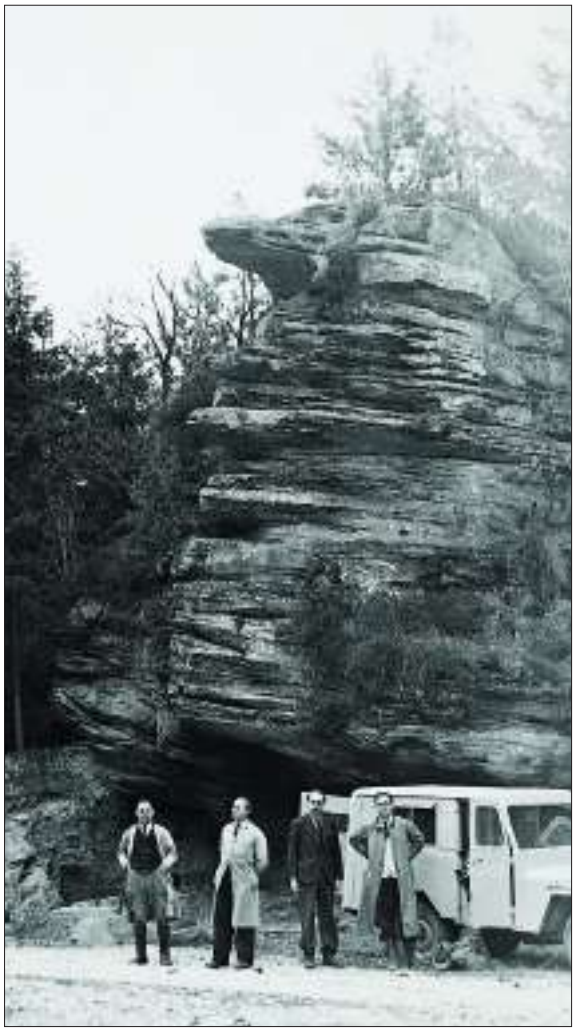
(Histoire de la Préhistoire au Luxembourg)

The history of prehistory in Luxembourg

Prehistoric research began in the mid-19th century and was mostly conducted without any particular structure or focus (Engling, Arendt, Glaesener, etc.). This discipline came about as the result of a large collection of stone tools called ‘artefacts’ that were mainly found in fields by farmers when working the land (collections owned by Petry, Dondelinger and Graf, etc.). Nicolas van Werveke, Curator and Secretary of the History Department of the Grand Ducal Institute (1882-1909), conducted stratigraphic excavations and observations and compiled the first complete inventory of the collections. In the 1930s, the teacher Nicolas Thill carried out excavations of various rock shelters in the Müllerthal region and discovered near Reuland the Loschbour Mesolithic man, the ‘skeleton of the oldest known Luxembourger’. Dr Ernest Schneider compiled an extensive inventory of rock engravings and inscriptions found on sandstone rocks in Luxembourg. Various excavations were carried out by German archaeologists between 1940 and 1944. After 1945, several excavations were conducted under the supervision of Marcel Heuertz, Director of the Natural History Museum, and in cooperation with the Paris Institute of Human Palaeontology

Remerschen - ‘Raederbierg’
Salvage excavations on the site of a future main road conducted in 1999 by the Prehistoric Section of the Luxembourg National Museum of History and Art in cooperation with the Archaeological Department of the Luxembourg Bridges and Roads Administration.

In 1969, he published the first analytical review of the prehistory of Luxembourg. After the Second World War, several collections of great scientific interest were put together from artefacts recovered during surface reconnaissance conducted by local prospectors who kept a record of the exact location of each archaeological find. In 1979, a few archaeological enthusiasts set up the Luxembourg Prehistoric Society, which conducted the first modern excavations using three-dimensional recording systems and published an annual bulletin. Various investigations were carried out in partnership with foreign research institutes such as the Royal Belgian Institute of Natural Sciences (Brussels), the University of Liège, the Saarland University (Saarbruecken) and the Rhineland Archaeological Museum (Trier). In accordance with the Act adopted in 1988, the very first expert with special responsibility for the prehistoric heritage of Luxembourg was appointed in 1994. The research conducted over the last 30 years or so has shown that Luxembourg's subsoil is extremely rich in archaeological remains. However, only a handful of specially appointed experts are endeavouring to preserve this heritage, and approximately 30 archaeological sites are destroyed every year owing to ever-increasing changes in land use throughout the country. Modern excavations have essentially become rescue missions, with public authorities being forced to implement measures to save the history of our early ancestors from irreparable damage.



Berdorf. Hamm rock shelter - 'Kalekapp'
General view of excavations conducted by the Luxembourg State Museum in 1953. From right to left: James Baudet, Marcel Heuertz, Jean Kieffer and Marcel Brillon.

(Le territoire luxembourgeois)

Luxembourg territory

Luxembourg territory. Luxembourg has two main regions: Oesling and Gutland (literally 'Good Land'), which includes the Moselle Valley and the Minette coal basin. Together, they reveal a succession of sedimentary geological strata deposited as early as the Primary era right through to the Quaternary period. The country's geographical structure and make-up made various resources available that were particularly suitable for making stone tools. By studying the origin of rocks, it is possible to learn about the materials appropriated by our ancestors and understand the reasons for their movements from place to place. The Oesling region is situated in the northern third of the country and forms the Luxembourg part of the Ardennes mountain range that borders the Eifel mountain range in Germany. The region consists of a high plateau with elevations ranging from 400 to 550 metres above sea level and has a semi-mountainous landscape featuring narrow valleys that cut deeply into the schistose base dating back to the Primary era. Rock outcrops found throughout the region are essentially made up of schist, or layered metamorphic rock, containing several veins of quartz and quartzite that would have been exploited from the Palaeolithic through to the Neolithic periods. The Gutland region, at a height of between 250 and 400 metres above sea level, occupies the remaining two thirds of the country. Its landscape features cuestas - long ridges with two slopes of different gradient - and valleys that cut into plateaux of both hard and soft rock (Luxembourg sandstone).

Geological map of Luxembourg (P&Ch, Geology Department).

The Bajocian (Middle Jurassic) layers show evidence of relatively well-silicified hornstone that would predominantly have been exploited during the Upper Palaeolithic (Aurignacian) period. The Muschel-kalk (Middle Triassic) strata show various types of siliceous rocks particularly exploited during the Mesolithic period. Sandstone outcrops were used during the Neolithic period to fashion grinding implements (such as millstones or grindstones). The late Dogger (Middle Jurassic) cuestas that formed in the mineral basin at an elevation of nearly 400 metres above sea level are covered in deposits from the Tertiary period. Several outcrops of small nodules of cretaceous flint deposited in secondary position called 'Tetange flint' have been discovered in this region. The 'Red Lands' in the south of Luxembourg show evidence of hematite, exploited particularly during the Neolithic period. This region was subsequently exploited from the Iron Age for its rich deposits of iron ore (Titelberg oppidum, or urban centre, Differdange). The River Moselle forms Luxembourg's eastern border with Germany at an average altitude of 150 metres above sea level. In many places, the Moselle Valley is enclosed by Muschelkalk dolomite cliffs that occasionally open out into wide plains. The valley slopes are bordered by early Quaternary alluvial terraces. These floodplain formations show various types of rolled pebbles suitable for knapping that were often used in the early Palaeolithic period (Lower and

Gutland landscape, Luxembourg sandstone cliff (G. Hoffmann).

(La maîtrise du feu)

Mastery of fire

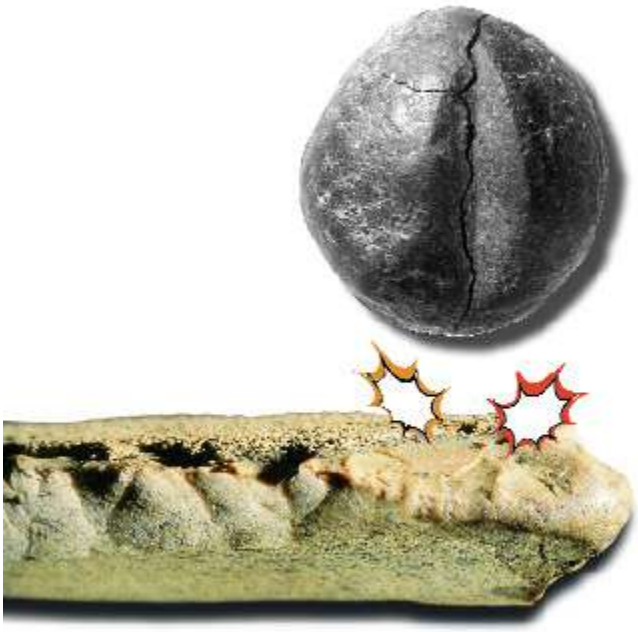
After the invention of tools made from wood and stone, the mastery of fire constitutes the second important stage in the history of mankind owing to its practical (lighting, heat, cooking, etc.) and social uses.

As evolution progressed, the 'hearth' became an essential feature around which human dwellings were organised. It is believed that Homo erectus was responsible for domesticating fire more than 600 000 years ago (ancient hearths discovered in Menez Dregan, Brittany, and in the Aldène and Escale Caves, south-eastern France). The first stone-built hearths appeared around 450 000 years ago. Significant archaeological discoveries (in Lehringen and Schöningen, Germany, and in Clacton-on-Sea, England) have provided evidence that fire was used to harden the points of wooden spears. Evidence shows that when modern man appeared 35 000 years ago, various domestic activities, in particular those carried out outdoors, were organised around the hearth. Numerous sites dating from the Upper Palaeolithic have revealed evidence of stone blubber lamps that would have provided man with sufficient lighting to explore the world beneath the ground and create cave paintings.

During the Neolithic period (5 000 years ago), 'fire arts' became more prominent in this part of the world with the production of the first receptacles made from baked clay.

The embers are then placed inside a small nest made from hay which is supplied with air by gentle blowing or by swinging the ignited nest back and forth until the first flames appear (Irian Jaya, New Guinea - P. Pétrequin / CRAVA).

The controlled heating of flint also meant that its mechanical properties could be improved and that it could be shaped more easily using pressure. The mastery of new 'fire arts' developed during the protohistoric period, particularly with the melting of metals (copper, bronze and iron) and glass. There were two main techniques used by prehistoric man to produce fire. The percussion technique consisted in striking a siliceous rock (flint or quartz) against a piece of iron ore (iron sulphide, pyrite or marcasite). This action led to the creation of sparks that were then used to ignite various types of fungus (touchwood) or dried plants (such as moss, bark or straw). The 'lighter' technique is currently the oldest known technique in Europe (dating back approximately 15 000 years). This technique involved the use of friction by rubbing two pieces of soft, dry wood together in such a way that the fast rotating movement produced heat in one of the two pieces of wood, which then led to the creation of embers. Although this technique is likely to be extremely old, preserved wood is found only rarely on archaeological sites; consequently, evidence of this type of fire production dates from just 12 000 years ago (Guitarrero Cave, Peru). A somewhat similar technique con-



Iron sulphide 'lighter' found in the Chaleux Cave, Belgium (Magdalenian era, Upper Palaeolithic) (IRScNB).

Close-up of the blunt tip of a flint 'lighter'. By striking a piece of flint against a piece of iron sulphide (pyrite or marcasite), a shower of white-hot sparks can be produced which are used to ignite tow made from fungus (tinder fungus or birch polyporus) or dried plants (C. Weber).

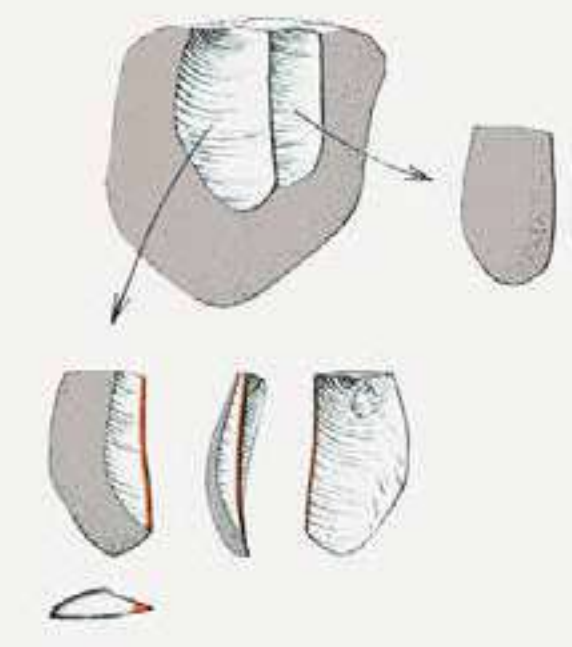
(Différences entre l'animal et l'homme)

Differences between animals and man

The invention of tools. With a view to finding food, protecting himself from dangerous animals and developing his environment, prehistoric man learnt at an early stage to make use of the materials freely available in nature (such as stone, wood, bone, etc.) in order to fashion tools. It appears that man is the only being to have invented and fashioned complex, sharp-edged tools. This is called 'propositional intelligence'. The discovery of the 'cutting edge' (3 million years ago) and the ability to perform repeated actions and understand the principles to be implemented constitute a first fundamental stage in mankind's history. The tool served as an extension of the hand, making it possible for man to carry out new activities and improve his use of the mineral, plant and animal resources available in his environment. Knapping methods improved with the invention of new percussion techniques used to create finer and longer implements (flakes, blades, bladelets, etc.), and later with the introduction of new processes involving techniques such as pressure and polishing (polished axes).

Example of contemporary application of stone knapping techniques involving a form of percussion flaking by throwing. Fabrication of adze preforms in Irian Jaya (New Guinea, Indonesia - P. Pétrequin-CRAVA).

Although prehistoric man's tools were rather basic and similar in nature at the outset, they gradually became more specialised and varied as prehistory developed. From the invention of the first primitive tools used for scraping, cleaning animal carcasses and breaking open bones to remove the marrow, to the development of tools used for hunting, cutting meat, making holes in animal skins, felling trees, building and cultivating, the main stages in man's evolution are distinguished by the use of increasingly complex techniques and the production of various types of tools typical of the traditions practised by different prehistoric groups. The type of rock used tended to be siliceous: flint, quartz, quartzite, obsidian, chalcedony, etc. The removal of a piece of stone for cutting, called a flake or blade depending on its length, was performed by either direct or indirect percussion. The first technique consisted in striking the chosen rock with a 'hard' (stone) hammer or a 'soft' (wood, antler, horn, bone or ivory) hammer or in simply pushing on the rock with a great deal of force (pressure). The second technique consisted in placing an intermediary object ('punch', 'wooden crutch', or lever) between the percussor and the stone (core).



The principle of and the processes and instruments used in knapping. The contact between the percussor and the stone boulder causes a shock wave to pass from the point of impact and spread into the boulder (core), leading to the removal by means of fracturing of a fragment (flake) of stone, the nature of which depends on the striking angle and the boulder's initial morphology. The core. This intentional fracture leaves behind recognisable characteristic marks (such as bulbs of percussion and impact rings) that are indented on the core and pronounced on the surface of the fragment. By conducting a meticulous study of these marks, the prehistorian is able to understand the formation of scars on a boulder or a tool, from which he can then determine its chronological and cultural origins. The analysis of knapping techniques and methods used by prehistoric man is conducted through close examination of archaeological finds and their comparison with artefacts produced as a result of experimental processes. The sharp-edged fragment. Apart from its 'butt' (a remnant of the former edge of the core used), the fragment obtained (flake, blade or bladelet) generally has two surfaces, called the dorsal and the ventral, and unmodified, sharp edges which may be retouched if necessary using even smaller fragments (retouches) in order to produce different kinds of tools.

(L'Archéologie préhistorique)

Prehistoric archaeology

The role of archaeology, as the 'science of the past' (from the Greek 'arkhaios', meaning 'ancient', and 'logia', meaning 'theory', i.e. 'study of what is ancient'), is to reconstruct ancient societies and man's different ways of life. This human science focuses first and foremost on facts and not on objects and has become an indispensable aid for historians and prehistorians alike. Since the 19th century, archaeologists have developed methods and techniques both in the field and in the laboratory. The procedures used allow them to understand the subsidence process of deposits and to explain the relationships between archaeological remains and preserved evidence that has been brought to light. Because the original archaeological context is irreversibly destroyed during excavation work, archaeologists conduct a methodical gathering of information and detailed recording of all data. Once a reference system has been installed in the area to be studied, generally one consisting of an adjustable network of squares called a 'grid', the investigation of the subsoil is conducted on two axes: the vertical axis (stratigraphic section) and the horizontal axis (stripping). The excavation is only a first stage. The next step is to endeavour to piece together the facts from the various pieces of evidence gathered and recorded. Once information has been gathered in the field, laboratory evaluation of the products of human activity (e.g. lithic, bone and ceramic industries) may begin. Archaeology is not confined to understanding the human phenomenon. It also focuses on reconstructing man's palaeoenvironmental framework with the help of analyses that draw on different disciplines and enable the evaluation of samples collected from archaeological deposits. The various elements which go to make up the natural environment may be determined with the help of different fields of study such as palynology, anthracology, carpology and malacology.

Malacology. The study of different types of shells (snails, shellfish, etc.) reveals more information about the environment (undergrowth, exposed area, etc.), the period (certain species existed during certain periods) and the climate, as the different species only evolved at certain temperatures (R. Meyrick).

The contribution of the natural and physical sciences, such as radiocarbon dating, is vital for identifying chronostratigraphic or biostratigraphic zones, i.e. in order to determine the type of climate, vegetation and animal species prevailing in a particular region at a given time. Zooarchaeology involves the study of faunal remains in order to establish the existence of different animal species and the practice of cynegetic (hunting, fishing) or pastoral (animal husbandry) activities by prehistoric societies. All of this data, combined with those derived from the earth sciences (pedology, micromorphology, etc.) and from climatology (temperature curves, etc.), make it possible to reconstruct the evolution of the palaeoenvironmental framework in which our ancestors succeeded one another through the ages. The new technologies, although still used to a limited extent in archaeology because of their often prohibitive cost, can help refine the traditional methods used to understand early human communities by providing a new field of knowledge and making it possible to study increasingly smaller samples. Furthermore, the computer processing of data provides numerous useful applications for introducing new hypotheses and experimenting with virtual simulations. Ultimately, once the different analyses have been made, the results of an excavation must be published so that specialists and the public alike may have access to the newly acquired knowledge.

Three-dimensional recording. Any moveable artefacts recovered amongst the carefully excavated remains are not moved until their position and orientation have been recorded in relation to a given reference point. The recording technique generally consists of determining as accurately as possible all three dimensions of the objects and structures recovered by gathering the greatest possible amount of information (plans drawn on graph paper, photographs, film recordings, stereoscopic images, digital data, etc.) in the field prior to their removal. The objects are subsequently recorded in an inventory, removed from the site and packed ready to be taken to the laboratory for cleaning, restoration and more detailed study.

(Le Paléolithique inférieur)

The Lower Palaeolithic

The Lower Palaeolithic saw the arrival of the first Europeans. Nearly two million years ago, members of the genus Homo erectus left Africa and made their way towards other continents and into more temperate climes. The skull of Homo erectus has an average cranial capacity of 1 000 cm3 and has a receding forehead, a large, prognathic face with eye sockets surmounted by pronounced brow ridges forming a fold of skin, and a large lower jawbone with no chin. The limb bones are very similar to those of modern man. The oldest evidence of human presence in Europe was discovered in Dmanisi in Georgia. The skeletal bones recovered date back 1.7 million years; however, finds such as these are extremely rare and usually date back no more than 800 000 years. During the Lower Palaeolithic (2 million to 250 000 years ago), global climatic changes occurred in the form of alternating hot and cold (glaciations) periods that were propitious to the development of species which have since become extinct: Merck's rhinoceros, giant hippopotamus, forest elephant, Mosbach's horse, Deninger's bear, steppe bison and musk-ox. Groups of Homo erectus evolved to the point where they were able to adapt both physically and technically, particularly with the domestication of fire around 450 000 years ago and the manufacture of specific tools:

Butchery of animal carcasses on the banks of the Moselle during the Lower Palaeolithic (B. Clarys).

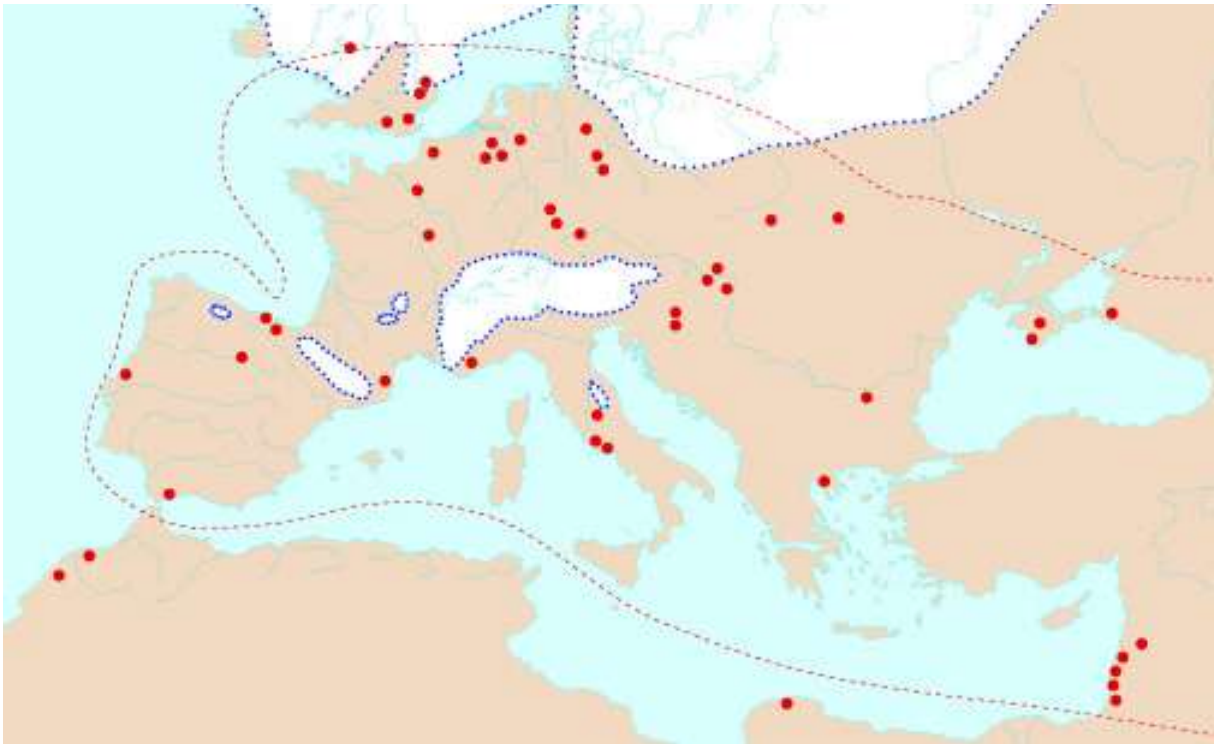
However, the discovery of numerous bones belonging to large herbivores and other wild game on archaeological sites suggests the practice of hunting in groups. The mastery of fire is one of man's earliest achievements. Although evidence of burnt soil or bones dating back 1.4 million years has been discovered, structured hearths evidencing the successful domestication of fire by Homo erectus appeared only around 450 000 years ago (Menez-Dregan and Terra Amata, France; Vertesszöllos, Hungary; Torre in Pietra, Italy; Zhoukoudian, China; etc.). Hearths are often the only features that can provide us with an understanding of how living floors were structured. It is extremely difficult to identify direct evidence of dwellings, but several sites have shown evidence of floor use such as caves lined with stones and gravel (Tautavel) and circular arrangements of stones to secure huts in the open (Bilzingsleben and Terra Amata) or in hollows (Lazaret). The oldest stone industries discovered in Luxembourg are believed to date back between 500 000 and 250 000 years. However, the discovery of highly patinated and weathered choppers on upper terraces suggests that such industries date back even further. These tools were predominantly made from pebbles of quartz or quartzite found locally (on the ancient alluvial terraces of the Moselle and the Sûre) or further afield, as in the case of Devonian purple quartzite known as 'Taunus quartzite'. Evidence of the most representative industry of the Palaeolithic period was discovered on a middle terrace of the Moselle in Remich. Finds include flake tools and rare handaxes belonging to the Acheulian period. As yet, no archaeological sites have been discovered,

Arrival of Homo erectus in Europe nearly 2 million years ago.

(Au Paléolithique moyen)

The Middle Palaeolithic

During the Middle Palaeolithic (250 000 to 35 000 years ago), the Neanderthal genus known as Homo sapiens neandertalensis evolved in western Europe; his skull has a large cranial capacity (1 650 cm^3), an occipital bun (rounded protrusion at the back of the head), a low, sloping forehead and a large jaw. The long skeletal bones are extremely robust, but their morphology is thought to be very close to that of modern man. The continuous alternation of warm (interglacial) and cold (glacial) periods that took place during the Middle Palaeolithic was propitious to the evolution of large herbivores (bison, aurochs) and smaller caprids (goat-like animals such as the ibex), but also animals of the steppes (horse) which replaced woodland species (roe deer, red deer); carnivorous animals such as the bear, lynx and wolf were also prevalent. Neanderthal man was a nomadic hunter-gatherer who set up his encampments either in shelters, in caves or in the open. The oldest known Mousterian dwelling found to date was discovered in Molodova on the south-western plains of Ukraine. The study of some archaeological sites has revealed evidence of specialised activities (butchery sites) and the development of strategies for the group hunting of wild game living in herds (gregarious animals), in particular the large bovids (bison and aurochs).



Frostet Zone
Relics of Neanderthals
Distribution of the Neanderthals.in Europe

The stone tools made during the Middle Palaeolithic represent an important stage in the development of knapping techniques. While bifacial tools (handaxes, leaf-shaped points) dating from this period are still fairly common, it is the development of methods for the mass production of standardised flakes (using Levallois, discoidal and Quina techniques) that demonstrates man's mastery of the principles involved in predetermining and anticipating the shape of a tool prior to its being created from a stone boulder. These retouched flakes served as side scrapers, knives, denticulated blades and spear or arrow points. This industry is known as 'Mousterian culture', named after the site of Le Moustier (Dordogne, France). Several recent finds (in Syria and Germany) have shown that some of these tools were hafted (discovery of traces of bitumen, a substance used to glue rock to a handle or shaft). Moreover, analyses of micro-traces of wear and tear have shown evidence of extensive woodworking, such as the use of wooden spears during the Lower Palaeolithic (Lehringen, Germany). With regard to the scale of territory occupied, research into this period shows early indications of the movement of raw materials over moderate distances (30 to 100 km). The Neanderthals were the first of our ancestors to develop a belief in some sort of spiritual existence, as illustrated in particular by the fact that they buried their dead. Evidence of burial rituals has revealed such activities as the digging of graves in which the dead were buried (La Ferrassie, France; Spy, Belgium), sometimes with offerings (Teshik Tash, Uzbekistan) and flower tributes (Shanidar, Iraq). Furthermore, some researchers suggest that there is evidence of cases of ritual cannibalism (Krapina, Yugoslavia).

Side scraper showing traces of bitumen (Syria) (E. Boëda / CNRS).

Reconstruction of the Mousterian burial site of La Ferrassie (France) (B. Clarys).

(Le Paléolithique supérieur)

The Upper Palaeolithic

The Upper Palaeolithic (35 000 to 10 200 years BP) saw the arrival of Homo sapiens sapiens - the 'Cro-Magnon' man - and the disappearance of Neanderthal man. The modern human skull has an average cranial capacity of 1 400 cm3, a high forehead, a reduced jaw size and a well-defined chin. This period also saw the last of the glacial ages in Europe. The climate during the Upper Palaeolithic was essentially cold and dry. These harsh seasonal conditions were propitious to the evolution of cold fauna species, in particular large herbivores (mammoth, woolly rhinoceros, reindeer, Saiga antilope, musk-ox, horse, giant deer, etc.) adapted to large, open spaces such as the tundra or the relatively wooded steppes. It was only during the Late Glacial period (16 000 to 10 200 years BP) that the more temperate species such as the red deer, elk and aurochs reappeared.

Painted frieze of horses. Aurignacian period, Chauvet Cave, France (J. Clottes / Chauvet Cave Team).

Horse. Aurignacian period, Vogelherd Cave, Germany (H. Jensen / University of Tübingen).

Excavations conducted beneath rock shelters, in caves and on open-air sites have shown evidence of groups of semi-nomadic hunter-gatherers with a highly organised social structure who were particularly well adapted to the difficulties of living in such a cold environment and moved from place to place with the seasons. Populated areas consisted of temporary dwellings (simple and more complex tents) and areas for domestic or more specialised activities. Areas habitually used show evidence of the management of natural resources for the provision of minerals and food (selective and specialised hunting and gathering techniques). A succession of cultures known as 'techno-complexes' were evident during the Upper Palaeolithic, where tools were made from hard animal material (such as bone, ivory or antler) and stone.

These tools were used for cynegetic activities (hunting, fishing and processing of animal prey) and comprised throwing weapons with projectile heads (bone points, arrows, harpoons, etc.) and a large range of tools (such as end scrapers, burins, borers, retouched and unretouched blades) designed for processing skin, meat, tendons, horn, wood, etc. While adopting a more opportunistic approach to the manufacture of flakes, the laminar technique became the main method of knapping. The mastery of this new technique meant that it was possible to produce larger quantities of elongated blanks, called blades or bladelets, using a standardised template. The discovery of numerous tools made from bone - in particular, bone points of various shapes, spear throwers, punches, needles and harpoons - has demonstrated the growing importance of working with hard materials of animal origin - previously, a rare and somewhat unsophisticated activity. Ever since his arrival in Europe, a distinctive characteristic of modern man was his interest in aesthetic values: in addition to making jewellery (from shells, teeth, ivory beads, etc.) and cre-

Anthropomorphic statuette with feline head. Ivory (Aurignacian period), Höhlenstattstädel, Germany (T. Stephan / Ulmer Museum).

(Le Paléolithique supérieur au Luxembourg)

The Upper Palaeolithic in Luxembourg

Finds from the Upper Palaeolithic in Luxembourg consist of several lithic and bone artefacts discovered (as a result of past excavations and surface collections on open-air sites) on the sandy, silty summits of Luxembourg's sandstone plateaux. As natural high ridges, these plateaux provided an excellent vantage point for watching for wild game down in the valleys. The discovery of several groups of characteristic flint tools belonging to various cultures (such as Aurignacian, Gravettian or Magdalenian) suggests that the Moselle corridor between the Rhine Basin and the Paris Basin was regularly used by groups of hunter-gatherers during the more temperate phases of the Würm/Vistula glacial stage. As quartz and quartzite gradually became less commonly used for making tools, flint - both imported and found locally - went on to become the main material used. Tools attributable to the 'Aurignacian techno-complex' (35 000 years BP) have been found on the surface of several open-air occupation sites. Numerous examples of lithic industry (9 000 artefacts), made from local, poorly silicified flint, Bajocian (Middle Jurassic) hornstone and high quality flint, have been found on the 'Laangen Acker' site in Altwies. This industry mainly involved the use of flakes, resulting in the discovery of many items used in knapping (cores, flakes, etc.) and numerous burins, scrapers and chipped artefacts. The discovery of blade tools is rare. The age of a bone fragment from a cave lion or panther, found in a diaclase (rock fissure) in Altwies, has been estimated at 32 000 years BP. Small groups of artefacts made from quality imported flint (found on the sandstone plateaux in Bourglinster and Kehlen and in the Oetrange diaclases) suggest evidence of the 'Gravettian techno-complex': tanged, or stemmed, points (known as Font-Robert points) and points with flat retouches (known as Maisières points) are among those found.

Cave lion (Panthera leo spelaea) (B. Clarys).

Mammoth (Mammuthus primigenius) (B. Clarys)

Reindeer (Rangifer tarandus) (B. Clarys).

This latter type suggests evidence of regular human activity on Luxembourg territory during a period dating back as far as 28 000 years BP. The excavation of the Oetrange diaclases has also revealed a number of items of aesthetic value made from bone that are characteristic of the Upper Palaeolithic and are indeed the earliest evidence of artistic activity in Luxembourg. There was a significant hiatus in the occupation of Luxembourg after the Gravettian period owing to extremely rigorous

Distribution of Pleistocene fauna and Upper Palaeolithic sites discovered in Luxembourg.

climatic conditions during the second glacial maximum 22 000 years BP. The first phase during which areas such as the plateaux and the Great Northern Plain were reoccupied took place during the Late Glacial, which began round about 16 000 years BP and corresponds to the Late Magdalenian occupations. Several series of lithic tools made from high quality flint recovered from the surface are evidence of the presence of Magdalenian popu-

Diaclase in a sandstone cliff in Oetrange where Palaeolithic bones have been discovered.

lations in Luxembourg (Beaufort, Bourglinster, Kehlen, Medernach and Ermsdorf). Numerous bone finds belonging to the cold fauna of the Quaternary period have been recovered in the Würmian alluvial deposits of the lower Moselle terrace between Mertert and Wasserbillig (mammoth, rhinoceros, etc.) and in Remerschen, as well as at the base of rock shelters in the sealed diaclases of the Luxembourg sandstone plateaux and in fillings excavated in the quarries of Oetrange (mammoth, marmot, lemming, woolly rhinoceros, reindeer, aurochs, grouse, etc.) and Altwies (lion, reindeer, horse, etc.).

(L'Epipaléolithique)

The Epipalaeolithic

This period (11 800 to 10 200 years BP) marks the end of both the Upper Palaeolithic and the Pleistocene, prior to the warmer climate of the Holocene, and covers the last two climatic phases of the Late Glacial, the Allerød and the Younger Dryas. In the Luxembourg area, cultural aspects of the Epipalaeolithic have been revealed by evidence of occupation by hunter-gatherers of the 'Federmessergruppen' (arch-backed pieces) and also some rare insets belonging to the Ahrensburgian culture. During the Allerød and Younger Dryas, the natural environment consisted of steppe where the pine tree became more prevalent than the birch. The temperate climate fluctuation that occurred during the Allerød (11 800 to 10 800 years BP) brought favourable conditions for the spread of relatively open forest cover towards the north and encouraged both the appearance of the red deer and aurochs and the evolution of the 'Federmessergruppen'. The end of the Allerød was marked by the powerful eruption of the Lake Laach volcano (eastern Eifel); evidence of volcanic ash produced as a result of the eruption can be found in Luxembourg's soil deposits. The Younger Dryas (10 800 to 10 200 years BP) represented the last major return to a cold period with

An Epipalaeolithic encampment in the lower Moselle valley (reconstruction) (B. Clarys).

A feature of the 'Federmessergruppen' was a type of projectile blade called a 'backed point' (generally with a curved back, but also seen with an angular or rectangular back), which appeared as early as the Late Magdalenian during the final Bølling interstadial. In Luxembourg, evidence gathered from this period consists of isolated finds and a few series of backed points discovered on the surface, in particular on the plateaux above Hesperange and in the lower Remerschen valley. These assemblages are associated with a collection of commonly-used tools, particularly truncation burins and short end scrapers. The Ahrensburgian is a cultural complex consisting of small insets displaying an 'oblique truncation and peduncle', first identified in northern Germany. The subsistence economy of the groups of Ahrensburgian hunters from the cold Nordic plains was based on hunting - in particular reindeer - in an open environment. Further south, several sites have shown evidence of the presence of such groups (caves in the Belgian Ardennes and in the Eifel region of Germany). In Luxembourg, several isolated finds of points on surface sites (Hobscheid and Sandweiler) raise the question of their southern dispersion. During salvage excavations on the site of the proposed motorway link with the Saar between Remerschen and Schengen, evidence has been found of an industry based on imported flint of excellent quality. Having originated in Luxembourg, this industry can be compared both with the Ahrensburgian 'Belloisian industries' and with the Mesolithic assemblages that date from the start of the

Overview of salvage excavations on the site of a planned slip road onto the motorway at 'Remerschen-Raederbierg'.

(Le Mésolithique)

The Mesolithic (Middle Stone Age)

The Mesolithic (Middle Stone Age) in north-western Europe spans the climatic stages of the early Holocene that range from the Preboreal through to the Early Atlantic (10 200 to 6 500 years BP). The Mesolithic was a period during which the last communities of hunter-fisher-gatherers existed in a temperate and wooded natural environment. The natural environment. Climate warming occurred during the Mesolithic, and the territory gradually became covered with forest (pine, birch, oak, etc.). The advent of a more temperate climate forced cold species such as the reindeer and horse to move further north or seek higher ground. They were soon replaced by species such as the red deer, roe deer, wild boar and aurochs. Favourable conditions provided by a stable climate and the presence of non-migratory fauna seemed to lead to a marked population increase. Way of life. Groups of hunter-gatherers developed new hunting strategies and invented weapons that were better suited for use in a wooded environment and for hunting game that had become increasingly difficult to track; the use of the bow became widespread for hunting game that was easily startled. Fishing techniques became more varied with the use of harpoons, hooks, basket-traps, nets, and so on. Gathering activities played a key role: these consisted of collecting not only plants, but also

Pine.

Aurochs (Bos primigenius) (B. Clarys)

Wild boar (Sus scrofa) (B. Clarys)

Dwellings. Various dwelling structures discovered in Europe (hearths, tents, etc.), established both in the open and in rock shelters, provide evidence that Mesolithic groups of hunter-fisher-gatherers were able to adapt to diverse natural environments. They occupied every eco-

Hunting in forest environment during the Mesolithic (B. Clarys).

logical niche: coastal areas, valleys, plateaux, semi-mountainous and mountainous regions, as well as the slopes of upper mountain areas. Funerary rites. Numerous Mesolithic graves studied in Europe, both individual and collective (necropolises), have revealed evidence of funerary practices involving more or less customary rites (burial, cremation, incineration, with and without manipulation of the body). Very few preserved artefacts of aesthetic value have been recovered. Except for the regular occurrence of jewellery made from shells, evidence of mobile art (on pieces of Baltic amber, cobblestones, bone or wood), engravings and cave paintings is still quite rare (Spanish Levant in the Mediterranean Basin and the Great Northern Plain). The practice of lithic knapping (stone tool making) focused on the manufacture of throwing weapons and implements for working with plant materials, animal meat and bone. Mesolithic industry featured in particular the manufacture of miniature versions of certain tools designed to be used as knife blades and spear points: 'microliths'. Geometric shapes (triangle, segment, trapezium, etc.) were secured or tied, individually or in series, on shafts (arrowheads) or on handles (knives). During the Mesolithic, flint knapping was conducted on a much smaller scale and was generally more sophisticated. The laminar blanks produced tended to be fairly irregular (Coincy knapping technique), except towards the end of the Mesolithic when the use of indirect percussion made it possible to create very regularly shaped

(Le Mésolithique au Luxembourg)

The Mesolithic in Luxembourg

A large number of relics dating from the Mesolithic have been discovered in Luxembourg during surface exploration, and several archaeological excavations have revealed structural evidence of occupation (hearths, etc.). The oldest-known Luxembourg grave dates from the end of the Mesolithic. The first postglacial climatic intervals (Preboreal, Boreal and Early Atlantic) serve as reference points (chronozones) to help define Early, Middle, Late and Final Mesolithic classifications. Techno-cultural assemblages have been formed according to collections of arrowhead types. The presence or absence and the size of certain types of inset (oblique truncated points, segments, points with retouched bases, triangles and trapezes) have therefore made it possible to define four complexes: the Epi-Ahrensburgian, the Beuronian, the Rhine-Meuse-Schelde group and the Montbanian. The Preboreal (10 000 to 9 000 years BP) was characterised by a plant environment dominated by pine forests. Sites occupied during the Early Mesolithic included not only hollows (‘Karelslé’ in Waldbillig) and rock shelters (‘Kalekapp’ in Berdorf), but also open sites on plateaux (‘Haed’ in Altwies) and in the lower valley. Lithic industries based on flint sourced both locally and further afield have led to the discovery of ‘oblique truncated insets’ and even a few ‘backed micropoints’ of Epi-Ahrensburgian type. Series of stone tools dating from the Late Preboreal and Boreal exhibit points with retouched bases and triangles (scalene and isosceles) that are characteristic of the Beuronian complex. Assemblages which feature a predominance of oblique truncated points and segments over other inset types are said to belong to the ‘Beuronian.

‘Haed’ in Altweis.
In 1983, while regularly exploring the plateaux in the Altwies area, Dr P. Ziesaire discovered numerous Mesolithic artefacts in the reddish sand beneath a layer of earth freshly removed from a site in the vicinity of ‘Haed’ earmarked for industrial exploitation as sandstone quarries. Before the site was destroyed by quarry activity, salvage excavations were conducted under the scientific direction of members of the Luxembourg Prehistoric Society. During these investigations, modern excavation methods were used and nearly 10 000 lithic artefacts were carefully recovered from a natural depression that was explored across an area of over 30 square metres. In particular, a hearth set with flattened stones was discovered, along with numerous pieces of charcoal and several charred hazelnut shells; burnt bones and a set of suid (wild swine) teeth were also found, despite the fact that bones are very rarely preserved in sandy environments. The lithic industry discovered belongs to a Preboreal period of the Early Mesolithic.

A' phase known as 'Nordic facies' ('Galgebierg' in Diekirch). During the Boreal (9 000 to 8 000 years BP), the hazel gradually became more dominant than the pine. A number of rock shelters ('Atsebach' in Reuland and 'Kalekapp' in Berdorf) and several surface sites (Flaxweiler, Diekirch, Ettelbrück and Oberfeulen) have revealed evidence of industries belonging to the 'Beuronian B' phase featuring a prevalence of points with retouched bases and scalene triangles. The Middle Mesolithic also saw the development of a 'Beuronian C' facies featuring scalene triangles and points with unilateral or bilateral retouches ('Im Gründchen' in Hesperange). Deposits of narrow backed bladelets and leaf-shaped points (mistletoe leaf points) dating from the Late Boreal belong to the Rhine-Meuse-Schelde group (sites in Derenbach, Feulen, Gonderange, Ermsdorf and Kayl). The Early Atlantic (8 000 to 6 500 years BP) saw the development of mixed oak forests. Two distinctive facies - 'Beuronian D' and Montbanian - have been established for the industries of the Late and Final Mesolithic in the light of an increase in a particular category of insets: the 'trapezes'. The use of indirect percussion (Montbani knapping technique) made it possible to produce extremely regular bladelets. These standardised blanks assisted in the manufacture of trapezoidal insets by means of controlled fracturing (microburin technique). During the Final Mesolithic, the base of trapezes featured flat, inverse retouches (Hesperange, Wincrange, Kehlen, Diekirch, Keispelt, Lorentzweiler and Heffingen). The oldest prehistoric graves dating from the Late/Final Mesolithic discovered to date in Luxembourg were found beneath a rock shelter at 'Loschbour' in Heffingen, located in the sandstone region of Luxembourg. Alongside

'Kalekapp' in Berdorf. Rock shelter during excavations (D. Leesch).

minor examples of flint industry, various bone tools (bevelled antler points, suids' canine teeth, etc.) recovered nearby provide evidence of the hunting of wild fauna (red deer, roe deer, wild boar, aurochs, etc.). At the end of the Mesolithic, approximately 5 400 years BC (6 500 years BP), the last groups of Mesolithic hunters gradually disappeared as the first Neolithic farmer-pastoralist communities were established; a great deal about the processes involved remains to be discovered.

(Les sépultures mésolithiques de “Loschbour”)

The ‘Loschbour’ Mesolithic graves

The ‘Loschbour’ Mesolithic graves are the oldest prehistoric tombs found to date in Luxembourg. They were discovered beneath a rock shelter located on the confluence of the Loschbour stream and the Black Ernz in the Müllerthal region. While one burial site was found many years ago (Loschbour I, 1935), evidence of a cremation has been discovered nearby only very recently (Loschbour II). Between 1935 and 1939, after having conducted excavations in the Oetrange region, Nicolas Thill (born in Heffigen) undertook further investigations near Reuland beneath sandstone rock shelters on the left bank of the Black Ernz valley. On 7 October 1935, during excavations conducted on a talus rich in tufa (porous rock composed of calcium carbonate) at the foot of a sandstone cliff alongside which runs the Loschbour, a human skeleton and a ‘hearth’ were discovered just a few metres apart. Following this find, anthropological investigations were carried out with the help of Marcel Heuertz from the Luxembourg Museum of Natural History. The skeleton had been buried in a stretched-out position, laying on the back with the feet pointing towards the hollow of the rock. The knees were half bent and slightly raised, and the forearms had been folded and laid across the thorax. The presence of a reddened slab (capstone?) resting on the skeleton, two aurochs rib fragments placed alongside the thorax (animal offerings?) and a small, round piece of flint found inside the skull (viaticum?) suggests a deliberate burial.

Official delegation at Loschbour. Official delegation on the site of the discovery on 18 January 1936. From left to right: J. Tockert, Lecturer at the Athénée of Luxembourg and Secretary of the Society of Friends of the Museum, N. Thill, M. Friant, Lecturer at the Paris School of Anthropology, Dr E. Feltgen, E. Wirion, Engineer at the Luxembourg Bridges and Roads Administration, V. Ferrant, Curator at the Luxembourg Museum of Natural History, M. Heuertz, Lecturer at the Athénée of Luxembourg, Assistant Curator at the Luxembourg Museum of Natural History, Professor R. Antony, Director of the Laboratory of Comparative Anatomy at the Paris National Museum of Natural History, G. Faber, Headmaster of the Boys’ High School and F. Simon, Director of the Luxembourg

The deceased was a fairly short (1.60 m) adult man of robust stature with a well-developed muscle structure. Found several metres away from the burial site, a fire structure, called a 'hearth' by early researchers, also revealed several human remains belonging to a single individual. In this case, the bones had been burnt and revealed traces of butchering marks made using a flint tool, suggesting the cremation of the deceased with manipulation of the body either before or after death. A burnt piece of jewellery was found among the bone remains: a pierced shell fossil (Bayana lactea) originating from the tertiary boundary of the Paris Basin. According to radiocarbon (14C) dating, the Loschbour II cremation is older (Late Boreal/ Early Atlantic) than the Loschbour I burial. New research (using stratigraphy, palynology and typology) carried out in 1981 under the direction of the Luxembourg Prehistoric Society (F. Spier and P. Ziesaire) and the University of Liège (A. Gob) appears to confirm the homogenous nature of the Loschbour I grave, lithic relics and bone finds. Two radiocarbon (14C) dates conclude that this burial belongs to a late Mesolithic phase (presence of trapezes). The graves discovered on the Loschbour site corroborate and include evidence of the different funerary rites (burial, incineration, manipulation of the body, individual and collective graves, etc.) that are known to have been performed during the Mes

Reconstruction of a burial during the Late Mesolithic at Loschbour in the Black Ernz valley (B. Clarys).

western Europe. T
numerous grave fillir

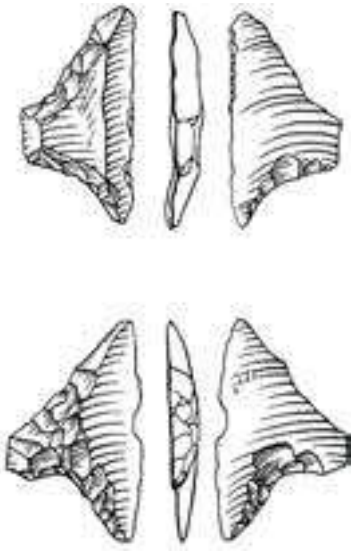
Heffingen -Loschbour II: burnt piece of jewellery, pierced shell (Bayana lactea) (C. Weber).

located in the sides of Luxembourg sandstone formations have proved to be an invaluable resource for studying Mesolithic populations in general and their funerary practices in particular.

(Derniers chasseurs mésolithiques, premiers paysans néolithiques…)

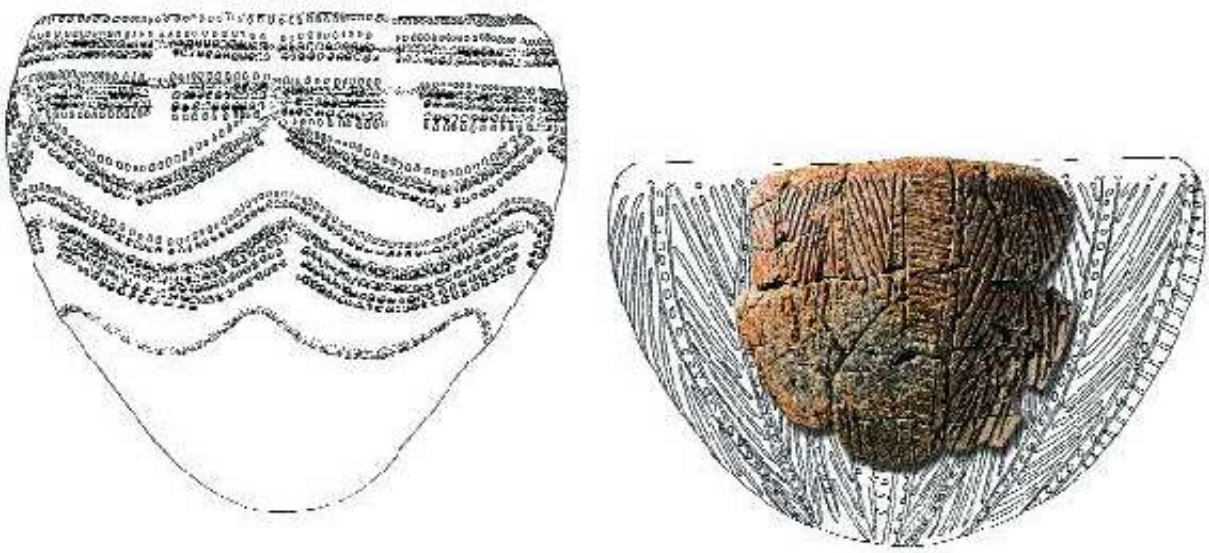
The last of the Mesolithic hunters and the first of the Neolithic farmers...

The last of the Mesolithic hunters and the first of the Neolithic farmers … After two million years of an economy based on predation (hunting, fishing, gathering, etc.), man gradually made the transition towards an economy of production based on agriculture and animal husbandry. This process of transformation is known as Neolithisation. Neo-lithisation represents a decisive turning point in human history with the development of new techniques (baked clay pottery, rock polishing, construction of permanent dwellings, weaving, basketry, etc.). Their gradual integration encouraged population development through the mastery of food production. This Neolithic phenomenon - originating in the Near East - spread to the Luxembourg area. The first farmer-pastoralists gradually settled their villages on the fertile lands, particularly in the lower valley area. Evidence suggests that the last local groups of Mesolithic hunter-gatherers were involved in trade to varying degrees with the first Neolithic farmers (foodstuffs, furnishings, techniques, etc.). Some archaeological sites indicate that certain goods and ideas were borrowed, or even that they were assimilated through dissemination and acculturation upon the arrival of the Neolithic peoples. As a result of this cultural contact, several Mesolithic groups practiced animal husbandry, horticulture and agriculture in keeping with their own semi-nomadic traditions. .



Stone arrowheads. Influence of Mesolithic hunters on the manufacture of Neolithic 'Danubian'-type asymmetrical insets.

Nearly 5 500 years BC, the last encampments of Mesolithic hunter-(pastoralist?)-gatherers moved to the outer edges of areas used for Neolithic cereal cultivation, and in their place the first sedentary villages were established; a great deal about the processes involved remains to be discovered over time and space and in the light of the different regions. In the Moselle Basin, there is evidence that the exchange of technologies - for example, techniques in the production of pottery and traditional stone tools - took place between the last Mesolithic and the first Neolithic communities. On the surface of the Gutland sandstone plateaux, several lithic series from the Late Mesolithic (trapeze industries) have been discovered along with examples of Limbourg and La Hoguette-style pottery (Beaufort, Hesperange and Medernach). This earthenware cannot have belonged to the Neolithic Danubian tradition (techniques, tempers used, different shapes and decoration, etc.) and seem to be the legacy of Mesolithic groups undergoing a process of acculturation. The presence of such pottery, also found in Alzingen, Diekirch, Remerschen and Weiler-la-Tour, suggests the possibility that this type of production stems from the southern influences of the Cardial Impressed cultural tradition. Conversely, the technique involved in manufacturing Neolithic 'Danubian' arrowheads seems to be the legacy of the local Mesolithic substratum.

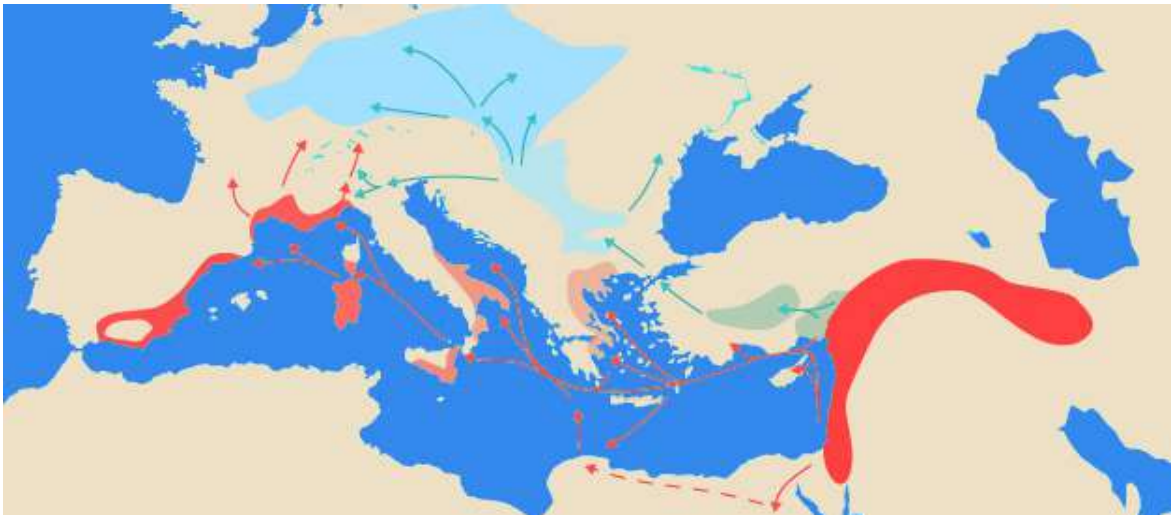


Pottery. Influence of Neolithic farmers on the making of La Hoguette (left) and Limbourg-style pottery ('Grossfeld' in Alzingen, C. Weber and A.-M. Wittek).

(Le Néolithique)

The Neolithic (New Stone Age)

The Neolithic (New Stone Age). This period (5 500 to 2 500 years ago) represents a decisive turning point in the history of mankind: man began producing his own food, domesticating certain species of animal and cultivating several types of plant; hunting and gathering became secondary resources. The climate was temperate (Atlantic phase), warm and humid, and the landscape consisted of mixed oak forest (oak, elm, lime and ash). The Neolithic marks the gradual transition from an economy based on predation, where the sole activities were hunting, fishing and gathering wild resources, to an economy based on production through farming and animal husbandry. With a view to ensuring the production of their own food, the first pastoral farming communities settled in permanent dwellings, generally congregating in villages once the land had been deforested to establish fields and farms. This major transformation encouraged population growth and the development of the social, cultural and ideological structures of the first farming societies.



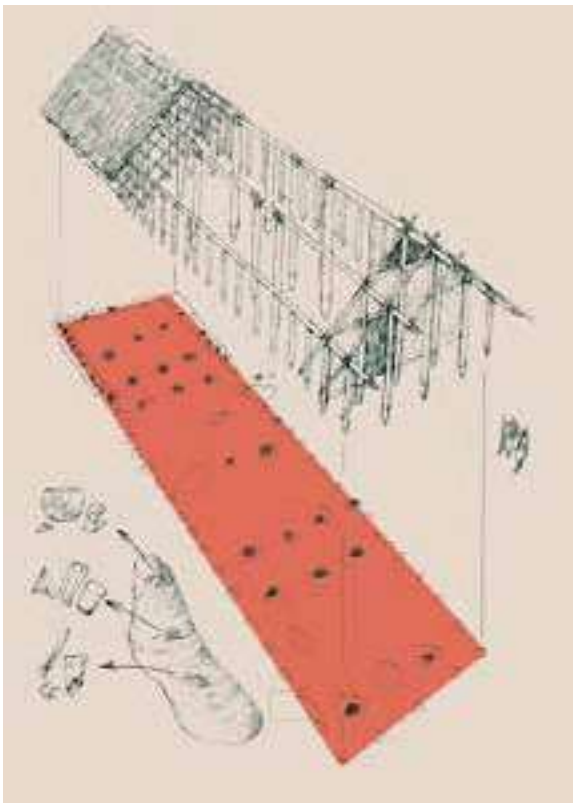
The Neolithic phenomenon. The advent of the Neolithic phenomenon towards the 10th millennium BC in the ‘Fertile Crescent’ of the Near East emerged as an important transformation and a decisive turning point in the history of mankind. After developing to the Red Sea, the Black Sea and the Mediterranean, its influence spread back towards the west of Anatolia as far as the Balkans. Two main trends gradually established themselves in western Europe: the first trend of Neolithic Europe was the ‘Cardial Impressed Ware’, named after the method of decorating pottery using Cardium (cockle) shells. Towards 6 500 years BC, it spread across the Mediterranean and reached the shores of Italy, France and Spain. The second trend spread across the continent via the Balkans towards Greece, Yugoslavia, Romania and Bulgaria (Starcevo-Koros-Cris culture) and developed into the ‘Danubian’, also known as ‘Linear Band Pottery’, that established itself along the expansive

The last encampments of semi-nomadic Mesolithic hunter-gatherers gradually moved away to allow the first sedentary Neolithic villages to be established; however, the way in which this was achieved in terms of time and location remains as yet undetermined. This new way of life brought with it technical innovations: pottery, spinning and weaving, basketry, polishing of stone, wooden and bone tools (adzes, scissors, axes, etc.) intended for working with wood and soil. Slash-and-burn cultivation saw alternating phases of preparing land for cultivation and leaving it to lay fallow; tools used for ploughing included the ard (digging stick) and the furrowing stick. Populations subsequently increased, territorial boundaries were firmly established and fields were in permanent use. The use of the swing plough made it possible to manage several ploughed fields. Cereals were harvested using the sickle or reaping knife, beaten with a flail or threshing mallet and then stored either in large pots, silos dug into the ground, granaries or natural sites (such as caves). Natural rock hollows were sometimes used as a byre or sheepfold. In Luxembourg, Neolithic man was involved in all of the developments prevalent in central Europe, adopting the contributions of the Rhine and Paris Basins both with regard to stylistic influences in pottery and to the acquisition of the hard and siliceous rocks used. The cultures and groups of the Moselle Basin are associated with the ‘Rhineland chronology’ which has been divided into four main phases: the Early, Middle, Late and Final Neolithic. These periods saw a succession of diverse cultures characterised by the building of structures, tools and pottery decoration. Pottery was a characteristic feature of the Neolithic and was associated with a sedentary way of life and a farming economy. The types of pottery produced became more varied as each group during each period developed its own style (techniques, shapes and decoration). Pots were made from a ball of clay built up by hand or using a combination of plates and coilings. They were either patternless or decorated with stamped or incised patterns using shells, fingers, punches, etc., and then smoothed by rubbing the damp clay, shined by polishing the almost dry surface or coated with slip prior to firing.

(La culture du Rubané)

The Linear Band Pottery Culture

The Linear Band Pottery Culture. This period (5 300 to 4 900 years ago) was part of the 'Danubian' Culture which appeared towards 5 500 years BC in the Rhine region and towards 5 300 years BC in north-western Europe. The first farming communities to inhabit the Luxembourg area were part of this culture known as



Linear Band Pottery house from the Early Neolithic. Floor plan and elevation. View of marks indicating holes intended for the positioning of load-bearing posts (house foundations) in the ground in a row of three. The sidewall posts were driven in side by side in a bedding trench dug to the rear.

'Linear Band Pottery', or 'LBK Culture' (Linearbandkeramik), after the style of baked clay pottery decorated with linear bands. The Linear Band Pottery of north-western Europe consisted of the province of Hainaut and the Hesbaye region in Belgium; the province of Limburg in the Netherlands; and the Aldenhoven plateau, the Bochum region, the Middle Rhine and its main tributaries- the Moselle and the Main- in Germany. The style of the north-western European group is characterised by a type of pottery decorated with bands of waves or spirals filled with incised (lines) or imprinted (dots) patterns made using tools such as the simple punch or multiple-tooth punch (comb). The Linear Band Pottery of the Moselle has distinctive features which reflect the regional influences of neighbouring groups. In Luxembourg, Linear Band Pottery villages were established at the bottom of the primary valley (Grevenmacher and Remerschen) and the secondary valley (Diekirch), on the silty hills of south-east Gutland (Alzingen, Aspelt and Weiler-la-Tour) and, less frequently, on top of a rock spur on the sandstone plateaux (Altwies). The rectangular houses (approximately 16 m long and 6 m wide) were built facing north-west or south-east. Their structural framework was built using tree trunks, the walls were constructed using wattling (trellis made of pickets and branches to hold back earth) and cob (mixture of clay and straw) and the roof was made from plant material (thatch, reed, etc.) supported by posts on the inside. The inside of the houses was divided into three sections by the load-bearing posts. These posts were positioned perpendicular to the main axis of the dwelling, dividing the space into different rooms (areas used for domestic or

The outer walls were often surrounded by trenches dug to extract material for making the cob; these were subsequently used for waste disposal and roof drainage. Into these trenches would be thrown food remains (bones from both hunted and domesticated animals, edible plants, etc.) and worn-out or broken items used by the first pastoral farmers in their everyday lives. By analysing pottery, it is possible to identify different chronological phases and cultures. Patterns (impressions, groups of lines, segments, etc.), their arrangement on vases and the techniques used all make it possible to identify regional groups: Linear Band Pottery of the Neckar River region, of the Lower and Upper Alsace, of the Central Paris Basin and of north-western Europe. In Luxembourg, most forms of decoration reflect the influence of the Neckar and Middle Rhine. Some patterns are clearly a result of the trade established with the North. There are no stylistic features that suggest relations with the western part of the Linear Band Pottery territory. There was a shortage of good quality flint in Luxembourg. Tools were mostly imported from the Rhine and Moselle region (Belgium, the Netherlands and Germany) and less frequently from the Paris Basin. Polished stone adzes were made using volcanic (basalt type from the Eifel region of Germany) and metamorphic (amphibolite type) rock. Tools for grinding grain and mobile grinding stones were made of local sandstone, while milling implements were made from Taunus quartzite platelets originating from the border region of Sierck-les-Bains. The dead were buried along with offerings that were gender specific: pottery and grinding tools for women, arrows and adzes for men, items of jewellery for both. Burials tended to be grouped together in necropolises located outside the village. Cremations were rare. Some bodies have been found thrown in grave pits, which begs the question of whether endemic or guerrilla warfare or ritual massacres had taken place. To date, no tomb from this period has been discovered in Luxembourg.

Section of a post hole, still showing the mark of the darker-coloured tree trunk, filled in with burnt cob ('Schengerwis' in Remerschen) (A. Hauzeur).

Diet
Butchery marks made by flint tool on cattle bones found in Altwies. The several fauna remains discovered on different Linear Band Pottery sites in Luxembourg (Altwies, Alzingen and Remerschen) suggest that the first Neolithic farmers bred and consumed mainly cattle but to a lesser extent also sheep and pigs (A. Hauzeur).

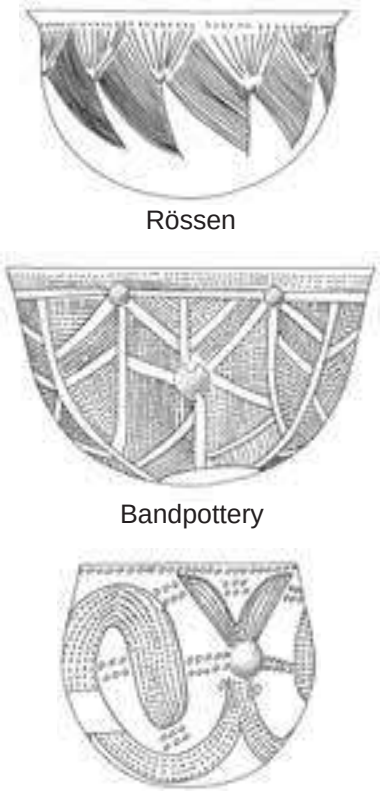
(Le Néolithique ancien et moyen)

The Early and Middle Neolithic

The Early and Middle Neolithic. In Luxembourg, the first Early and Middle Neolithic farming communities were part of the cultures of the 'Danubian tradition', a pan-European cultural trend originating in the Danube and Rhine valleys. These influences began with the Linear Band Pottery Culture (5 300 to 4 900 years ago) and continued until the Middle Neolithic with the Rössen Culture (4 900 to 4 300 years ago). It is believed that an initial phase of land settlement occurred in Luxembourg during the Early Neolithic that was limited to the banks of the Moselle (Grevenmacher and Remerschen). It is likely that the occupation of the territory then increased towards the secondary alluvial valleys of the Sûre (Diekirch), most probably spreading during the phases evolving from the Linear Band Pottery Culture from the Alzette towards inland areas, on the silty plateaux of south-eastern Gutland (Alzingen, Aspelt, Hellange and Weiler-la-Tour) and on the edge of the sandstone plateaux (Altwies). During the Middle Neolithic, the development of the Rössen Culture spread to areas similar to those of the Linear Band Pottery Culture: the lower primary valley (Wintrange), secondary valley (Diekirch), sandstone plateaux (Bourglinster) and new topographical locations such as the rock shelter (Christnach) and cave (Waldbillig) in the Luxembourg sandstone region of the Gutland. It is believed that an increase in the population and a diversification of pastoral farming took place

Spur-shaped Early Neolithic settlement (Linear Band Pottery Culture) located on the edge of a sandstone plateau. This distinctive topographical location discovered at 'Op dem Boesch' in Altwies concurs with the traditional settlements of the Linear Band Pottery period, situated by preference in the lower valley and on silty plateaux (B. Clarys).

The Rössen Culture (4 900 to 4 300 years ago) appears to have evolved from the Linear Band Pottery Culture, as seen by pottery types (shapes and decoration), different kinds of tools (adzes, perforated wedges, etc.), raw materials used (amphibolite, basalt, flint, etc.), as well as variations in building planning (evolution from a rectangular to a trapezoidal framework). Evidence of the intermediate Hinkelstein and Grossgartach cultural stages found in the Middle Rhine has not been found in Luxembourg. The Rössen Culture is best exemplified by its middle stage (Rhine-Main style) and also by its late stage (Bischheim style). In Luxembourg, research into Middle Neolithic open-air settlements (dwellings, village structure, funerary rites, etc.) is limited to the excavation of a number of ditches. However, excavations in a cave fissure in Waldbillig have shed some light on the exploitation of new ecological niches for the practice of a wide range of rural activities in outlying village areas, in particular with regard to the ways in which natural hollows were used during the Middle Neolithic (processing and storage of plant and animal foodstuffs). Rössen pottery from the middle stage (Rhine-Main style) featured open and closed shapes with either a flat or round base. The surfaces of receptacles were well smoothed and very hard fired. Different-sized pots were made, some of which had no ornamentation and some of which were decorated with a chevron design (zigzags) and small dots. Some incised patterns were inlaid with white paste. The rims and the handles were sometimes notched. Some pottery items appear to reflect influences originating in the Paris Basin (Cerny Culture). New stone tools appeared, in particular the asymmetrical perforated wedge (basalt and amphibolite) and triangular and edged arrowheads. Flint continued to be imported from the Rhine and Moselle regions; yellow-grey flint (Rullen type) was used in particular. Evidence has also been found of trading in shells (dentalium) originating from the shores of the Atlantic and/or the Mediterranean. Furthermore, engravings found on megaliths in Europe indicate that large polished axe blades made from jadeite may have been introduced as early as the Middle Neolithic.



Evolution of pottery styles of the Danubian tradition (Linear Band Pottery and Rössen Cultures).

(Occupation en grotte)

Cave dwelling

Cave dwelling. During the Middle Neolithic, the exploitation of new ecological niches (plateaux, valley slopes, semi-mountainous terrain) led to the diversification of pastoral farming. The introduction of new specialised activities meant that natural hollows (caves, rock shelters) were used in different ways (hunting retreat, animal housing, place of refuge, processing and storage of foodstuffs, funerary site, etc.). In north-western Europe, little is known about the extent to which hollows were used during the Middle Neolithic in comparison with the way in which villages and open-air rural practices were organised. Recent excavations conducted in the Waldbillig cave have shed some light on domestic activities carried out underground during the Rössen period (4 900 to 4 300 years ago). A stratigraphical study of the cave's deposits to a depth of 6 m has revealed evidence of various occupations ranging from the Mesolithic to the Middle Ages, in particular two levels belonging to the classic stage of the Rössen Culture. The 'Karelslé' cave in Waldbillig was formed as a result of the fracture (diaclase) of an enormous boulder that had worked loose from the edge of the sandstone plateau. Its fall had left behind a natural corridor similar in size to that of the inside of a house of Danubian tradition. A study of how the space was managed and of the relics discovered has made it possible to learn about certain ways of life during the Middle Neolithic. Items of pottery recovered and 14C datings have confirmed that this occupation dates from a latter stage of the Middle Rössen. Receptacles made from baked clay (large storage jars, bottles, bowls and beakers) show evidence of different types of storage, both free-standing and hanging. Pottery items decorated with zigzags and triangles often have rounded bases, whilst others have flat bases.

Modern excavations. As Nicolas van Werveke had not explored the entire 'Karelslé' cave fissure in the Waldbillig municipality, excavations using modern techniques were resumed by the Prehistoric Section of the Luxembourg National Museum of History and Art, under the scientific direction of F. Le Brun-Ricalens, from 1991 to 1998. During these new investigations, different archaeological levels ranging from the Early Mesolithic to the Middle Ages were uncovered. View of the stripping processes of the Middle Neolithic level and the recording of data from an elevated platform.

Evidence of wood working has been discovered in the form of a small, polished blade from an amphibolite adze. The little that remains of

Activity of cereal milling with a mobile roller moved back and forth on a fixed millstone. Various milling implements of this type made from 'Buntsandstein', or coloured sandstone, have been discovered in the 'Karelslé' cave fissure in Waldbillig (B. Clarys).)

the lithic industry consists of various tools mainly used in farming; a few flint sickle blades (coated with glaze), rollers and coloured sandstone millstones show evidence of the gathering and milling of cereals. The discovery of a large amount of charred barley, harvested in the form of ears, suggests that cereals underwent a treatment process in order to preserve them. The grain was grilled to make it easier to separate the ears and remove the husks and the seeds. This process also prevented germination during storage. A large hearth surrounded by holes intended for wooden stakes discovered in the centre of the cave is believed to have been a fire structure built for cooking, grilling and smoking certain foods. Evidence of hunting and animal husbandry has been recovered in the form of arrowheads (traces of adhesive material) and bones belonging to both wild (red deer and wild boar) and domestic animals. Hunting was much more important during the Middle Neolithic than during the Early Neolithic. Sources of meat were derived mainly from domesticated animals: cattle and pigs to an equal degree, and to a lesser extent small ruminants (such as sheep and goats). The relatively steep sandstone slopes were used as grazing and caves provided areas for temporary animal housing (possibly for cattle). Owing to its specific characteristics (stable temperature, darkness), the Waldbillig cave was used during the Neolithic for storage purposes, for example as a natural granary and possibly animal housing. Specialised activities for the preservation of grain (grilling and roasting) and meat (cooking and smoking) were also practised. Owing to the difficulty of access to the cave, it may have been used as a place of refuge, but on the basis of excavations carried out in part of the cave, it certainly does not appear to have ever been used for funerary purposes as is the case

(Le Néolithique récent et final)

The Late and Final Neolithic

The Late and Final Neolithic (4 300 to 2 000 years ago) are represented by the Michelsberg, Seine-Oise-Marne, Corded Ware and Bell Beaker Cultures. Little is known about these periods during which the first megalithic monuments appeared in Luxembourg. During the Neolithic, human society gradually developed a hierarchical structure and established forerunners to the chieftaincies and principalities of the protohistoric period. Long-distance trade increased and consequently encouraged the expansion of mining. The megalithic phenomenon spread to several European regions. Fortified sites situated on higher ground suggest that these were troubled times. Social markers confirm this: flint dagger, battle-axe, archery arm guard, etc. During the Final Neolithic, the first items made from copper began to circulate; flat axes and ceremonial daggers replaced those made from stone.

Axe of Jade
("Kehlen - "Juckel")

The Late Neolithic featured the Michelsberg Culture (4 300 to 3 300 years ago) with pottery forms featuring flared (bell-shaped) necks, bottles and bread plates. In Luxembourg, surface explorations on the sandstone plateaux have revealed some lithic series (Esch-sur-Alzette, Itzig, Mamer, Marscherwald, etc.) and a few potsherds (Kehlen). The types of tools found, made from flint imported from the Haspengouw (Belgium) and Rhine and Meuse regions (Spiennes and Rijckholt types) and also from the Champagne region (Romigny-Lhéry type), include large blades, end scrapers, triangular arrowheads and polished flint axes. The Final Neolithic was made up of several cultures. In Luxembourg, foliated and edged arrowheads found on the surface provide evidence of the facies of the Gord and Seine-Oise-Marne groups (3 300 to 2 800 years ago) that were characterised by coarse, undecorated pottery with flat bases and the construction of megalithic graves. Flint dagger blades (Grand-Pressigny and Tertiary banded Romigny-Lhéry types) made using the Pressignian method (Bourglinster, Blaschette and Diekirch) and occasionally polished (Marscherwald) suggest the establishment of contacts with the Saône-Rhône civilisation (2 800 to 2 400 years ago).

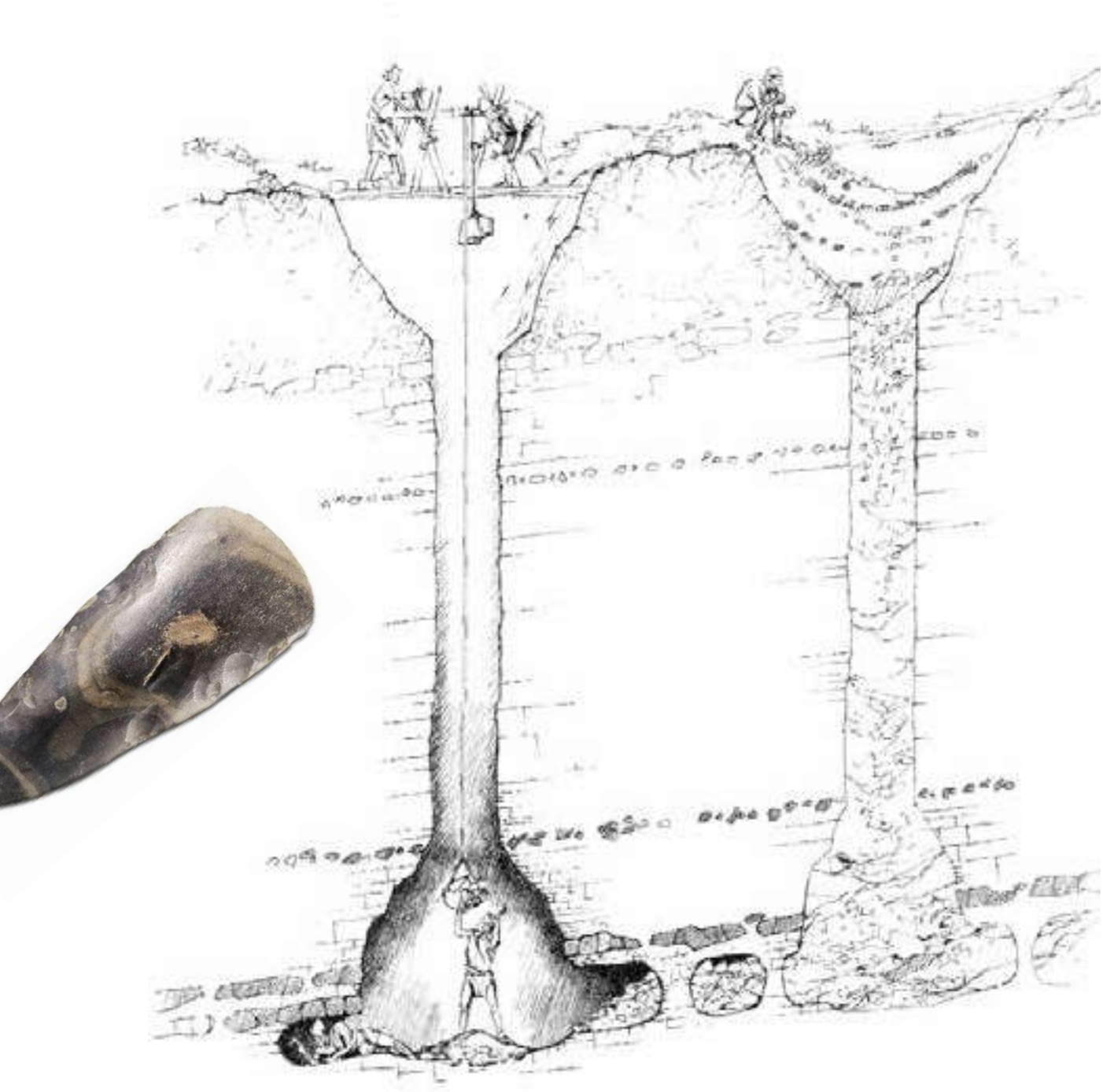
Bottle of Michelsberger Culture
("Koerich "Mierscher")

to 2 300 years ago) is characterised by pottery (beakers, amphoras, etc.) decorated with impressions made using cord (Schnurkeramik), a few examples of which have been found on the Bourglinster plateau beneath the Loschbour rock shelter in Heffigen. Battle-axes found in Bech-Kleinmacher, Dudelange, Echternach and Luxembourg and tanged arrowheads are generally attributable to the Corded Ware Culture that occurred more or less during the same period as the Bell Beaker Culture.

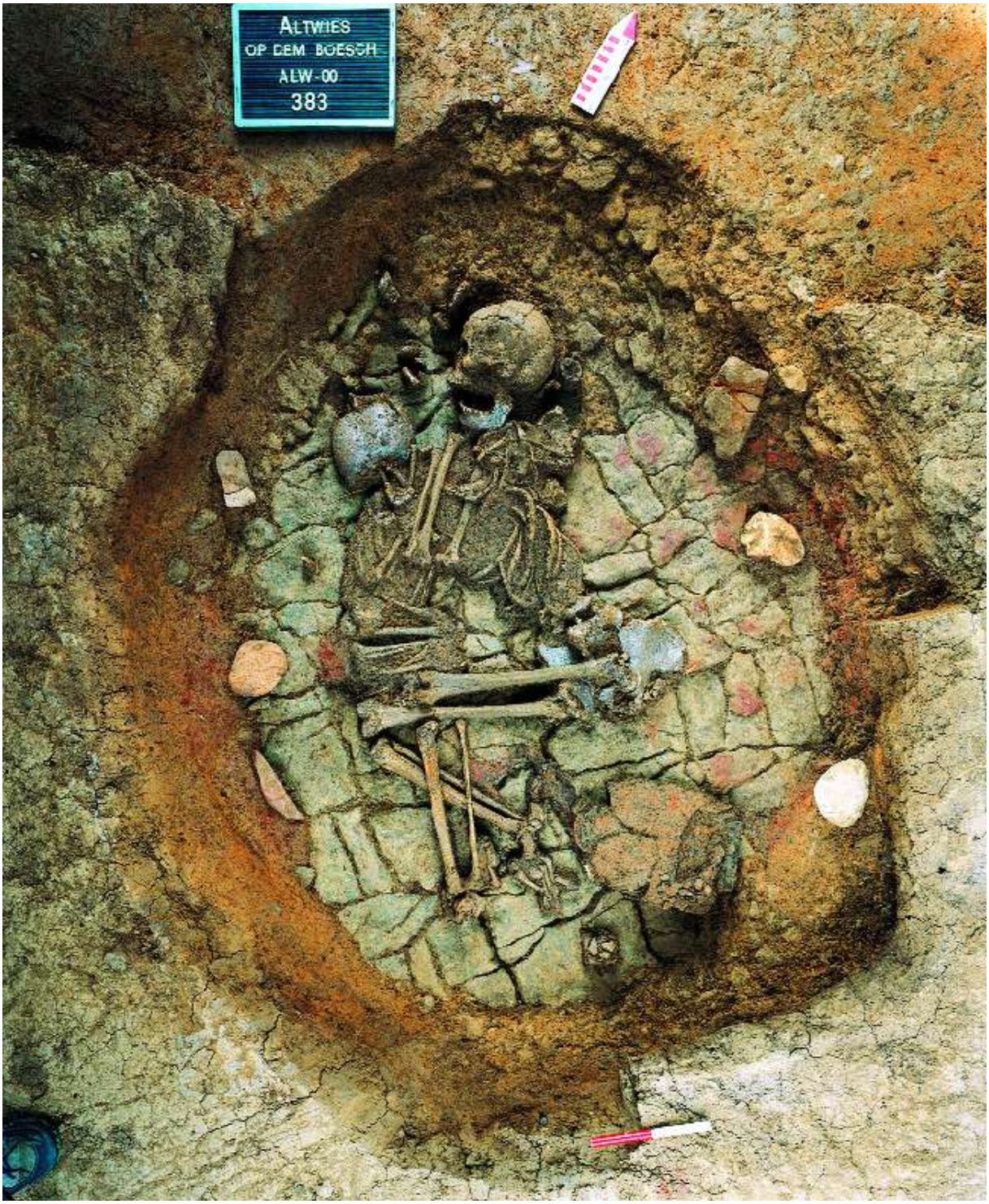
The Bell Beaker Culture (2 500 to 2 000 years ago) takes its name from vessels made in the shape of an inverted bell (Glockenbecher) that were often decorated with horizontal geometric bands. A few fragments of pottery with this characteristic decoration have been discovered during excavations in rock shelters (Berdorf and Heffingen), hollows (Waldbillig), open air plateau sites (Altwies and Medernach) and in the lower valley (Wintrange). Numerous archery arm guards made from schist and tanged and winged arrowheads have been found on the plateaux of the Gutland (possibly dwellings and destroyed graves). The funerary rituals from the end of the Neolithic were varied. The Michelsberg communities placed their dead in communal graves, in grave pits or natural hollows, forerunners to

Amphore of corded ware
(Bourglinster "Plateau")

the megalithic graves of the Seine-Oise-Marne Culture. Some dead were laid in stone coffins in the open or were buried in grave pits. During the Corded Ware and Bell Beaker periods, increasing importance was placed on social status (offerings, orientation of body). The use of isolated graves (Altwies), both single and multiple, in addition to the reuse of dolmens (megalithic tomb with a large flat stone laid on upright ones) (Berdorf) became standard practices.

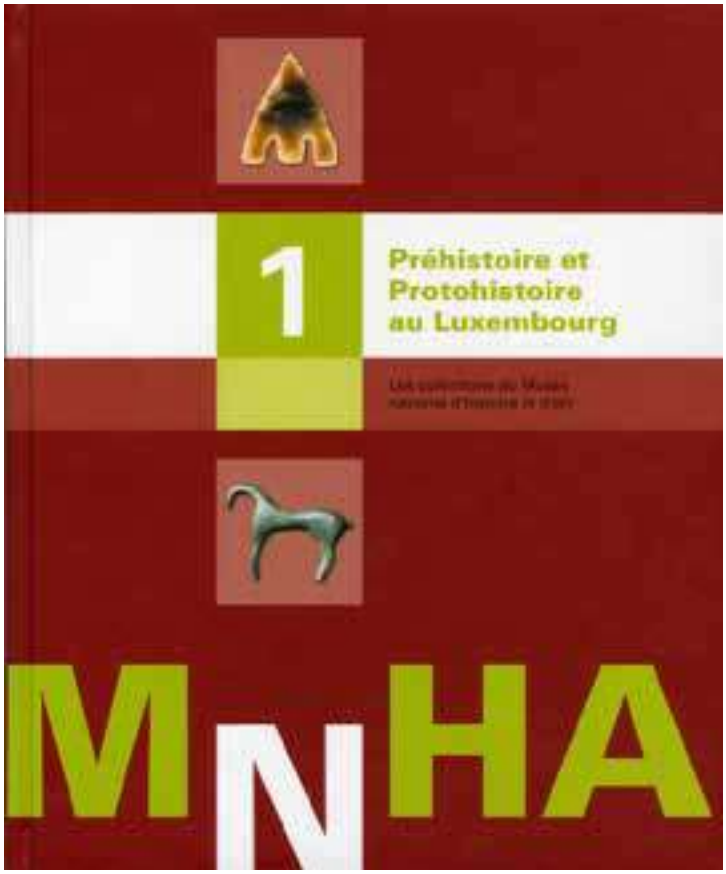


Mining.
In order to meet a growing demand for good quality flint, a material found in varying degrees of abundance in the various regions, processing workshops, opencast pits and mines with tunnels and shafts became widespread during the Neolithic. Tasks were prioritised and work became more specialised: mining using antler or flint pickaxes, production of large blade cores and flaked axe preforms, and manufacture of finished and semi-finished products intended for export, occasionally over great distances. It is not certain how these trade networks actually worked (perhaps travelling traders and knappers); however, they also involved the exchange of other hard stone tools such as greenstone axes (made from serpentinite, jadeite or eclogite), as well as other less functional items such as shells and salt. Several kinds of mining took place such as opencast mining and hillside mining, where narrow and low tunnels and even shafts (some dug to a depth of more than 8 m) were used to reach the layers of better quality flint (B. Clarys).



Double Bell Beaker grave (towards 2 200 years BC). A young woman and small child with beaker, buried in a grave pit on the Altwies plateau according to a conventional funerary ritual (lay-out and distinctive arrangement of the burial pit, orientation and position of the bodies, placing of offerings, etc.). Two Bell Beaker graves were discovered during salvage excavations conducted on the site of the planned motorway link with the Saar (C. Weber).

More information can be found in our exhibition catalogue:
1 Préhistoire et Protohistoire au Luxembourg, (Price 20 €)



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