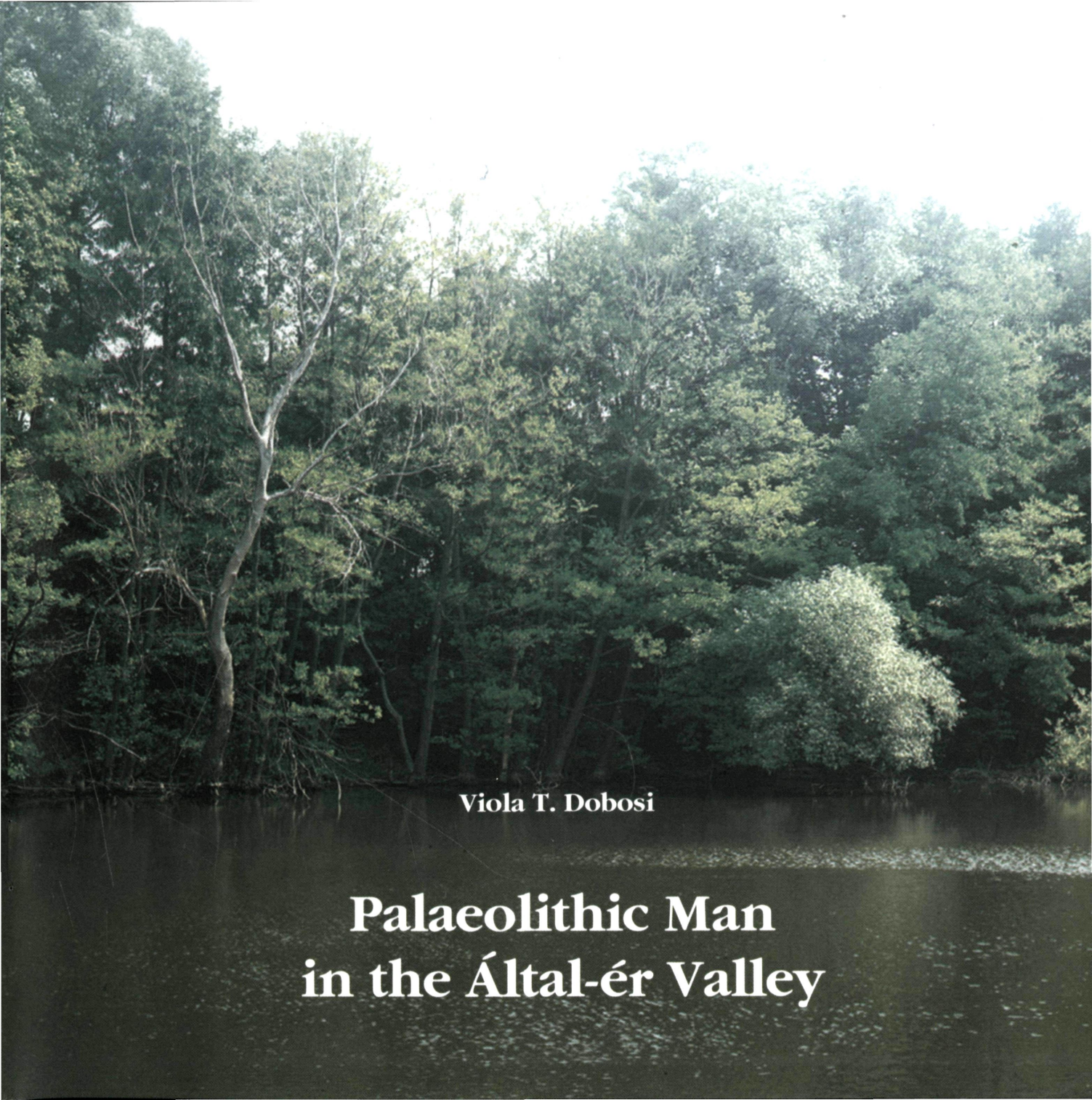

Viola T. Dobosi

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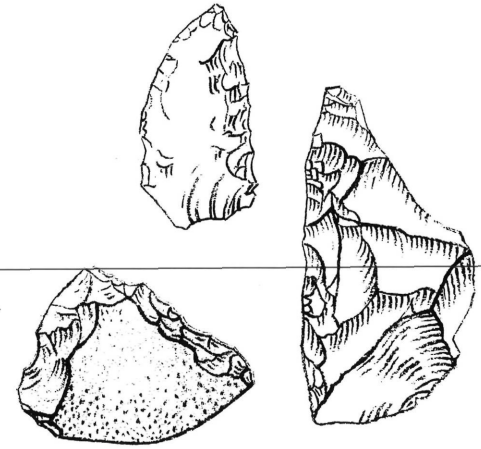

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# Contents

# The locality

Által-ér is a small rivulet in Komárom-Esztergom county. Following a short turn in Fejér county, it is arriving the territory of this county over Pusztavám and reaches the great river Danube near Almásfüzitő.

This stream was chosen as the title of our booklet because the settlements of prehistoric men are more or less connected to this decisive geographical element. Its wide valley separate the territory of the county into two parts, basically different in surface morphology. Által-ér is 51 km long, with a water catchment area of 120 $km^2$. Its spring is located in the Bársonyos hills: the highest point of this elevation composed of loose sediments is just over the spring of the Által-ér at 287 m a.s.l. The valley of the stream separates the flanks of the Bársonyos and the north-western ridges of the upthrust series of the Vértes Mts. The valley is directed from south-west to north-east, and the stream Által-ér reaches the Tata depression at Bánhida. From the source of the stream, the elevation of the surface decreased till this point by 130 m. At this point the stream, uniting with the Galla-stream is following the western upthursts of the Gerecse Mts. for a while, later on, after Tata, reaching the plains in a partly artificial bed, filling up the Öregtó (Old Lake) at Tata, it is running into the Danube.

A most enjoyable description of the area is given by Elek Fényes in his Geographical Dictionary (1851). True, he misplaced the spring of the Által-ér into Tolna county and mixed-merged it with the Galla stream, these small mistakes, however, did not spoil the value of the mid-nineteenth century description. Elek Fényes wrote appreciative words about the forerunner settlements of the city Tatabánya, Alsó- and Felsőgalla as well as Bánhida, and research workers of local history can also find a lot of interesting data in his „*circumstantial descriptions*".

The formation of the Által-ér valley is an organic part of the long geological processes resulting in the formation of our present environment.

On the place of the Hungarian Mid-Mountains, extending between Keszthely and Tokaj today, hundred million years ago a shallow branch of the sea used to exist. Thick layers of carbonatic rocks were sedimented on its bottom. The limestone ridges of the gradually desiccating sea were broken up by the movements of the earth crust. Part of them were lifted as mountains, other parts sank down. Along the fault-lines, sometimes masses of erupting volcanic lava were brought to the surface (Börzsöny, Mátra, Tokaj Mts.), while at other places, tepid springs rich in soluted

Fig. 1.
The valley of the Által-ér

mineral materials covered the surface with calcareous tuff.

The surface of the elevated mountains were eroded by physical and chemical processes of weathering, washed by meteoric water, planed by ice. The eroded detritus gradually filled in the flatlands, smoothed away the uneven surface of the lower lying territories.

The basic conditions were given for the formation of large terraces along the river and that of large morphological steps. On these flatlands filled up with detritus and sediments the mass of water with ever changing quantity and speed is sometimes carving anew, deeper bed for itself, sometimes depositing the sediment carried away so far. The constructing-destructing activity of rivers depends on, basically, the climate, though it can be influenced by many local factors. As the events of the Ice Age are periodic, cold and warm, dry and wet periods (and their combinations) alternated during the hundreds of thousand years, the terraces of the rivers also followed this rhythm.

The terraces of the Által-ér were preserved in an exceptionally intact condition. This can be attributed to calcareous tuff, playing a significant role also in the preservation of the prehistoric evidences. The fast accumulating compact „*cap*" of calcareous tuff conserved the terraces against posterior weathering and, at the same time, preserved the organic and inorganic remains inside, to a great luck for the students of several disciplines dealing with the Ice Age.

The difference between the two territories of Komárom-Esztergom county separated by the Által-ér is so apparent that the geographical technical literature divided the area into two micro-regions. The climate of the Által-ér valley is moderately cool and dry, the sum of sunny hours is around 1980 annually. The mean temperature of the summer half-year term is 16 $^{O}$C, the annual average is 10 $^{O}$C. Precipitation is 600-650 mm per year, on winter, the snow suitable for sporting covers the territory for 30-35 days.

The vegetation is variable and the area is fertile: on the meadows and ploughlands the usual cultivated plants for the region grow,

the natural forestal cover is developed in function of the surface morphology. On the sides of the Vértes Mts., we can find mixed karstic forests with sumac (Cotinus), while on the flatter areas, mixed deciduous forests can be found.

The raw materials exploited on industrial scale comprise building materials (sand, gravel, limestone and dolomite) and energy resources (brown coal seams of the Tatabánya and Oroszlány basins).

We have no positive data on the Palaeolithic of the territory. In the 1960-ies, József Glász collected some archaeological finds at Környe and its environs on the low-lying terraces of the Által-ér, and among the finds of younger periods, form of stone tools were spotted that could equally belong to the Palaeolithic period. There were no excavations on these collecting points and the typological features do not offer enough clues to an exact chronological, cultural classification of the finds.

Knowing however the lower reach of the Által-ér valley and the high „*density*" of sites in the Palaeolithic period we are confident that also this part of the valley was probably inhabited, too.

After joining the Galla-stream, the valley of the Által-ér takes an almost rectangular turn towards the north-west instead of the former north-eastern direction and then preserve this till its outlet. At the same time, this is the eastern border of the Győr-Tata microregion. The basement of the valley is getting constantly lower, at the firth of the Által-ér it is only 110 m above sea level. To the west of the Által-ér valley till Győr we can find low-lying slightly dissected flatland with terraces composed of detritic cones. The eastern margin of the Által-ér valley means a sharp border in base-rock same as in the upper part of the river valley. At the lower reach of the rivulet, the Eastern margin is more or less framing the western steep slopes of the Gerecse Mts. and its foothill region.

This relatively short phase of the stream valley, extending from Bánhida to Tata-Tóváros is the most important part of the region for our special point of view. The rivulet or stream - in Hungarian, „*ér*" is flowing in a considerably wide valley compared to its current water discharge; this short phase of the river, extending to not more than 15 km in length witnessed, framed, even participated important events in the life of prehistoric peoples inhabiting the area.

The northernmost member of the Transdanubian Mid-Mountain Range is the Gerecse Mts., lying at the eastern margin of the Által-ér turning to the north-west here. In its base rock and structure, the Gerecse is closely related to the Vértes Mts., so that between Szár and Felsőgalla, there is no natural border-line between these two members of the Mid-Mountain Range. Generally, the valley of the Komárom railway is referred to as the border line between the two mountains.

The western boundary of the Gerecse is the so called Tata depression or valley, with the Által-ér as the main water-course of the region. The series of upthrusts sloping steeply along the margins of the Gerecse are spectacular and create a mountain-like impression more than the altitude of the western ridges of the Gerecse, not reaching 500 m altogether, would imply.

The Mesozoic limestones of the Vértes and Gerecse Mts. used to serve for long time as raw materials for construction and secured the basis of several factories (cement, lime, „*marble*" etc.).

The phase of the valley extending from Bánhida to Tata-Tóváros is connected to three important Palaeolithic sites, listed in topographical order: Szelim-cave - Vértesszőlős - Tata, in chronological order: Vértesszőlős, Szelim-cave, Tata.

These archaeological site undoubtedly prove that at least this very small part of Transdanubia - small even within Hungarian measures - was inhabited for a long time, during several hundred years, by early men and prehistoric people and served as scenery for their life.

The geographical space was, however, different from the present one, partly due to the large temporal gap, and these differences can be proved - partly by evident physical reality, partly by the testimony of excavations. What is apparent for all of us is the calcareous tuff escorting the valley of the Által-ér, or in broader sense, the north-eastern margin of the Transdanubian Mid-Mountains in general. The karstic areas of the marginal regions of the mountains always attracted scientists. The medical springs of the region which are still active, the restoration of water balance disturbed during the mining activity, the spectacular forms of calcareous tuff, the analysis of the factors inducing, influencing or ceasing spring activities and the investigation of a large quantity of excellently preserved fossils furnished generations of research workers with challenging tasks.

Formation of the calcareous tuff is a phenomenon typical for karstic areas. The resulting rock has several technical names, most typically referred to as freshwater limestone or travertino to distinguish it from different limestone varieties of marine origin like most of the base rock constituting the Transdanubian Mid-Mountain Range. The formation of fresh-water limestone can be outlined, shortly, as follows:

*The meteoric water infiltrating the cracks of the old limestone is, to some extent, dissolving the limestone along the cracks. The soluted mineral content of the water depends on, mainly, the thickness of the leached limestone. In the case of great faults and sediments of different origin (e.g., the meeting point of loose terrace pebbles and hard limestone) over impenetrable layers these waters with rich soluted mineral content come forth the surface in the form of calcareous springs.*

*On the surface, the water is wasting and the calcareous tuff is deposited. The place, pace of the deposition can be influenced by several factors, the two most important ones being: the location of the erosional base, i.e., the lowermost point of the water catchment area and the quantity of natural precipitation diluting the minerals.*

These two decisive environmental factors can lead to two important consequences:

*- within an area of a few square kilometres, the erosional basis is uniform, the springs come forth at the lowest point of the relief lying at identical altitudes. Thus in a smaller region the calcareous covers of similar altitude will be coeval. The palaeontological-archaeological finds coming forth from these will mutually help in dating the terrace and the formation of the calcareous tuff and, at the same time, help in identifying the age when the finds were embedded into the limestone.*

*- the connection between the quantity of precipitation of a more or less longer period and the formation of the calcareous tuff allows us to draw, from the rhythm of sedimentation and the quality of the embedded looser sediments, consequences concerning the climate, on the long run, the physical environment of prehistoric people.*

The calcareous spring water will, quite often, build basins: such phenomenon can be observed in Hungary for example in the Szalajka-valley at the so-called „*veil-falls*", or in dripstone caves, on the side of the stalagmites (form of dripstone growing upwards from the floor of the cave). These are mostly in the order of a few centimetres to some decimetres. More bulky calcareous tuff basins can be observed at some more distant locations, nearest at the Plitvica lakes (Croatia), in the Yellowstone Park (USA) or in Turkey. These large calcareous tuff basins, run dry, encircled with variable height walls would be always a suitable place for settlement just the same as during the Ice Age for prehistoric people.

In the Által-ér valley, this calcareous tuff cover preserved us the remains of two invaluable settlements of prehistoric men, completed by the hunters' camp Middle Palaeolithic cave site opening at the margin of the Gerecse Mountains which is without parallel in our country.

# The time span: Ice Age

During the more than 4.5 milliard years of the history of our planet there were several periods of lasting great changes in the climate. They appeared typically as deterioration (cooling) compared to the average temperature and these long-term climatic fluctuations are termed together as Ice Ages.

In the long and inspiring debates concerning the formation several opinions were raised and the accepted main cause is wavering between them. It seems, however, certain that the basic cause is rooted in the rhythmic change of celestial/astronomic, therefore regular and calculable conditions. The most important among them is the modification of the elements regulating the Earth's course (the relation of the axis of rotation to the plane of the Earth's course, the elongated or circular form of the elliptical course around the Sun and the alternation of the angle between the orbital plane of the Earth and a theoretical vertical plane). These factors initiate a process the details of which are hidden; we know only the final results and even that, only partly. Due to several known and unknown reasons sometimes this, sometimes that factor of the complex process seemed to be of decisive influence (e.g., surface morphology of the Earth, distance from large water surfaces equalising the climate, elevation above sea level, being exposed or protected from ruling wind etc.). The long-term changes of the climate, however, caused permanent changes in both organic and inorganic nature, a large part of which resulting in evidence which can be studied by scientific methods.

One of these evidences is pollen. These most resistant microscopic plant particles can be preserved, provided the circumstances are favourable, in large quantities within the sediment. The levels of soil samples reflect contemporary vegetation and the ratio of alternating species can give information on climate and its changes. The Ice Age was described by the palinologist Magda Járai-Komlódi the following way (Kukoricaisten gyermekei [Children of the Maize God]. Budapest 1984, 48.):

„*We know well that the climate of our Earth became much colder several times during the past 3 million years (for the last time, some 20-30 thousand years ago), and for thousand s of years, much colder winters dominated over the Northern Temperate Zone than today. The water evaporated from the sea and the ocean transformed to snow-bearing clouds, and great snow-storms would drift over the continents. The ever increasing cover of snow stiffened under the great pressure into a sheet of ice. The ice cover of the*

*polar regions became thicker continuously and extended towards the south while the permanent snow limit of the high mountains descended. Finally, about one third of the Earth was covered by terrestrial ice cover and a giant sheet of ice of glacier „rivers", moving several centimetres a day. According to the estimations, during the greatest glaciation, an ice cover of approximately 45 million square kilometres used to cover mountains and valleys, at some places reaching the thickness of 2 km. Today the territories covered by ice are extended to not more than 15 million square kilometres. That is why we call this period „Ice Age".*

*On the place of today's taiga forests composed of pine and oak forests with exuberant foliage, there were ice planed waste-lands or, to the south of it, tundra covered by peat mosses and alpine vegetation, scrubby bushes, scroggy birches, polar willows and scarce groves of pine trees struggling for their survival like the Lapp-land of our days, covered by pioneer lichens and small mosses, housing animals that live in our days only on the alpine and arctic tundra. The water of the ocean dwindled away, the water level was lowered occasionally by several hundred meters. The areas with shallow water run dry because the water evaporated did not get back to the sea but remained in the form of solid snow and ice on the mainland."*

The Ice Age can be divided into several periods of glaciation and intermittent warmer periods lasting for several thousand and ten-thousand years each. For the division of the phases, several systems of names were used based mainly on locality names, calling each phase after a site where typical sediments and features were observed from the given period.

In Hungary we also have local names to the climatic phases; however, typically the names generally used in Central Europe are used - at least, understood - universally. These names are considered as the same and related to cover the same period which is not always the case for a local nomenclature. The phases of glaciation generally used in Central Europe are named after tributaries of the Danube originating in the Alps and a small lake, respectively. The glaciations are labelled G M R W, i.e., Günz, Mindel, Riss, Würm, while the interim phases are marked as G/M, M/R and R/W.

This double rhythm of changing climate, however, was also subjected to minor changes, lasting for some hundred or thousand years. These anomalies of the climate could and in fact did change the life-style and life rhythm of human communities. Similar to the geological present, the Holocene period (which is nothing else but a period between glaciations, a so-called interglacial) even during the history of humanity documented by written sources we can come across unusual periods of climate (e.g. the famous „*small ice age*" of the Middle Ages, the social and politi-

cal consequences of which are known to us: cool climate - catastrophically low yields of crops - famine - peasant resurrection movements).

Depending on climate (temperature, amount of precipitation), surface morphological forms (hillside, lowland, river valley) the soil and the sediments on the surface is changing, today as well as during the Ice Age. Loess - a yellow, porous calcareous dust transported by the wind - is sedimented in the circumstances of cold and dry weather. This *„yellow earth"* covers large areas within Hungary, deposited at some places in several metres thickness. Often it is stained by darker spots of plant-root cavities, holes and remains of ice-age animals and in specially favourable case, traces of settlements left by prehistoric men can be also found inside the layers.

The sedimentation of gravel, pebble and sand took place also in the dry periods, marking at the same time the degree of comminution as well. The rivers with diminished water discharge could no longer transport their load. In the time of mild *„inter"* periods, calcareous tuff was deposited in the vicinity of the springs. The vegetation living on the surface of the loess transformed the soil into humus. In the caves, during the warmer periods, limestone pebbles rounded by chemical and physical weathering were embedded into the sediment instead of the coarse angular debris split by the frost in the cold periods. The different layers accumulated over each other show well these changes.

The territory of the Carpathian Basin was too far to the south to be covered permanently with ice even during the most severe periods. The limit of the permanent ice sheet was closest to the area north of the Carpathes, about the latitude of Krakow. The climate and, consequently, its vegetation and fauna were, however, essentially different from those of our days.

The valleys of the rivers with essentially less water discharge than today were escorted by riparian forests. In the interior parts of the basin, there were mainly wide grassy pastures supporting great herds of large herbivores (mammoth, wild horse, auroch, reindeer).

In the *„inter"* periods lasting also for several thousand years the climate of the Carpathian Basin was similar to that of our days, sometimes even warmer. Remains of plants and animals native to the Mediterranean regions of our time were found in the corresponding layers.

Among the many *„Ice Ages"* in the history of our Earth, typically the last one is mentioned this way, without any further adjectives of distinctions. This period is especially important for us because this is the temporal and spatial framework, the scenery of the formation and development of Man. Following several million years of antecedents, Man reached its current level of physical development by the end of the Ice

Age and made most of the hunting-gathering way of life. The reconstruction of the life of people living in this period is realised by the analysis of excavated finds, experiments and the study of aboriginal communities living today. Due to the almost inexhaustible richness of the phenomena to be investigated, the study of the Ice Age is the study of several specialised disciplines. Preceding immediately the geological present, the number of fossilised evidence is also greater and more varied than those of the more ancient period, therefore its reconstruction can be more successful than those of the most remote phases of geological history.

Climate, organic and inorganic environment, Man himself in his physical reality and the culture created can be studied only after minute studies, the establishment of the age of different events etc. The totality of spiritual and material goods created by Man (and his ancestors) in the Ice Age is referred to by archaeologists as the Palaeolithic period (palaeo = ancient, lithic = made of stone).

The characteristic features of the period are:

- ✧ its full extent is dated to the preceding geological period (Pleistocene)
- ✧ it is the longest period in human history
- ✧ the hunting-gathering way of life expropriated, but did not change natural resources
- ✧ the most important tools were made of stone by knapping.

The investigation of the Ice Age differs from other, younger periods of archaeological research. Just because of the scarcity of archaeological data it must rely more on the results of other sciences and even a laconic, poor reconstruction of the former rich reality can be only accomplished by close scientific collaboration.

# Man

There was no idea of comparable revolutionary effect on the development of biology as evolution. When Charles Darwin worded in a generally understandable manner the rules of the formation and development of species, there were already a range of misinterpreted anthropological finds inside the store-rooms of museums, awaiting for correct interpretation in the historical process of the formation and development of mankind.

By the end of the 19th century, a triple division was established following the main line of the biological evolution of mankind that can be considered valid even in our days. Valid against all odds, as the phyletic tree of Man as a biological species spread extensively around the bare stem during one and a half century of research. New finds, followed by new theories, new chronological schemes and new methods feed this tree, to become more exuberant and more tangled.

Hungary is in a fortunate situation: the process of human development can be illustrated well on Hungarian finds with the exception of the Australopithecine line, often mentioned in popular scientific communiqués. This populous branch of Hominids, however, seem to be restricted to the eastern and southern parts of Africa and can be considered as a so-far extinct side-branch of evolution.

The sequence starts with the Ramapithecines. It was a great scientific sensation when, by the 60-ies of the last century, the lignite cover layer of the open-air iron ore mine at Rudabánya yielded a rich palaeontological find assemblage. It contained remains of cca. 80 individual finds of the Ramapithecine type, termed after the site Rudapithecus. According to the opinion of experts, this population of Primates was universally spread in the Old World 10-12 million years age, though it was not very frequent. According to the anatomical features found on the bones these beings were standing at the beginning of the row leading to humanity; the anatomical features already carried in themselves the possibility, moreover, necessity of a human type of development.

Following the age of the Ramapithecines, for a long period of time no finds are known to us from Hungary. This does not imply a break in the development because the main proof of the continuity of the process is modern man himself. The next phase of the evolution is documented in Africa: the age of the Australopithecines. Several sub-species, different in appearance as well as way of life populated the Savanna of Eastern- and Southern Africa about 2-4 million years ago. (The determination of the age is a source of many

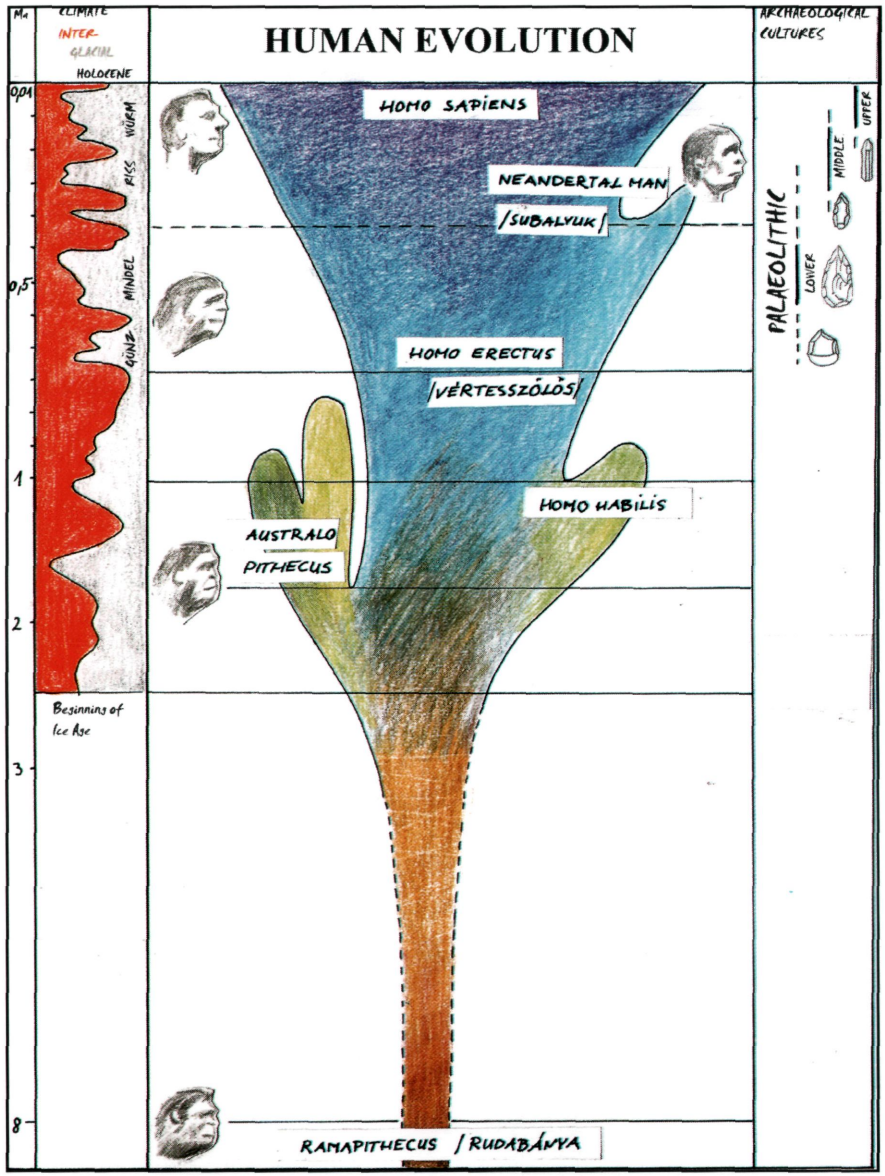



Fig. 2.
Evolution of Man

debates but the above dates seem generally acceptable). They were followed by the first genus termed *Homo* (= Man), *Homo habilis,* appearing about two million years ago.

The first station of the human phyletic tree, *Homo erectus,* i.e., early man, considered universally as the first genuine station of hominisation: after the diversified roots, the massive trunk, the base population. Though thinner-thicker side-branches mark the tendency of diversification in human phylogenesis, the identity of the *Homo erectus* as being really humans cannot be questioned. The name itself is a bit anachronistic, because the Primates walked actually „*erect*", on two legs, long before the Homo erectus, but the nomination given by the first students of hominisation had to be preserved. This human race populated the Old World during the on-coming Ice Age from Beijing to Portugal, from Germany to Java. (This does not imply that Man in his physical reality /human remains/ was found everywhere. Human settlements of this period were, however, excavated from many places. These settlements can be occasionally more authentic proofs of human presence than fossil human bones without accompanying finds). In Hungary, *Homo erectus* was found at Vértesszőlős. Their period of existence is the approximately half million years starting from the beginning of the classical European Ice Age. (Chronological data cannot be defined in this period even within the accuracy of millennia, just because the characteristics of biological development and the causalities of the different methods used for age determination.)

As we are approaching the present age, the pace of development is getting quicker (or, from more evidence, we have a more detailed image on this process). The generalised, uniform basic population was dispersed over large geographical areas, adapted itself to widely different environmental conditions, got gradually isolated and adopted different courses of development.

The „*classical*" prehistoric men called after the first locality, Neanderthals, appeared in the interglacial period preceding the last great glaciation period. They represent the middle phase of the human development. From their two major groups known to us, the Western European population seemed to get among relatively favourable conditions and flourished, creating rich and variable archaeological cultures, but probably due to the lack of forcing impetus, lost their ability to cope with changing circumstances, the ability for a biological transformation. The Neanderthals living at the western margins of Asia, in Asia Minor, at the same time, turned to *Homo sapiens* and became the base population of Eurasia. The age of the Neanderthals is only extending to some 100-150 thousand years (time is getting shorter, development faster!). In Hungary, human remains of the Neanderthal man were found at two localities: in the Subalyuk and the Remete-Upper caves. Fortunately, the

number of known settlements, hunting camps is much more than that. In Komárom-Esztergom county, their traces were found in the Jankovich-cave, in the Által-ér valley at Tata and in the Szelim-cave.

Biological development of man reached its peak by the middle of the last (Würm) glaciation, some 40-50 years ago. The ice-age ancestor of modern man *Homo sapiens* fossilis appeared. This *Homo sapiens* is completely identical with us in a biological sense, further development took place only in a cultural-social sense. Due to the artificial environment created for his own protection and comfort (arms, tools, clothing, housing) mankind could adapt well to small changes of the surrounding world, almost insensible during one human generation and the territory of the Carpathian Basin was practically never empty during the almost inconceivably long time of the ice-age climatic periods. Archaeological finds prove that at least some hunting communities fruitfully survived even the most severe periods of the Ice Age. It can be taken for certain that by the end of the Ice Age the Palaeolithic subsistence strategies for utilising the natural resources, plants, animals and mineral resources was suitably effective and successful.

Playing a little with numbers and collating known and/or deduced, estimated data, we can arrive at the conclusion that the Carpathian Basin could sustain at a given period not more than 30 thousand persons (!) following a hunting-gathering way of life. The area of the Carpathian Basin can be calculated (along the watersheds) 300 thousand $km^2$ large. We can estimate an ideal number for the individual hunting communities on the basis of ethnographical parallels as 25-30 persons in various distribution of age and gender, necessary for the procurement of food and the reproduction of the community. The game sustaining capacity of the area can be estimated on the basis of economical-ecological statistics (i.e., how large an area would be necessary for the game stock necessary for the survival of the hunters, without endangering the reproduction of the game-stock itself). The above calculations were made for ideal conditions that never really existed in the Carpathian Basin during the Ice Age as the territory was not habitable at all spots. Thus the 30 thousand estimate for the population is only for orientation and probably never reached during the Palaeolithic period. Considering the density of population in the Által-ér valley and Komárom-Esztergom county in general during the Ice Age our opinion is corroborated that this region, as also later on during our history, offered specially favourable conditions for the existence of humans.

Remains of *Homo sapiens fossilis* are known from Hungary in very low number, from the Istállóskő and the Balla caves.

The three great steps of human evolution can be paralleled to three great archaeo-

logical units: the culture of the *Homo erectus* - (Early man) - is the Lower Palaeolithic period, that of *Homo neanderthalensis* - (Neanderthal man) - is the Middle Palaeolithic, and the culture of the *Homo sapiens fossilis* is the Upper Palaeolithic. These great archaeological units were unfolded even in their own period in great variety and richness. As the human activity of the Ice Age is almost exclusively documented by the archaeological finds, the individual groups of the population are termed by the name of the archaeological cultures: these are find assemblages separable on the basis of tool forms or tool-making technology, limited in time and space. These cultures are the basic archaeological categories. It is certainly biassed and less colourful than the life of the former communities, but at least existing and available for analysis.

Considering the three Palaeolithic sites of the Által-ér valley, at Vértesszőlős a Lower Palaeolithic pebble-processing industry was found (this site is at the same time the eponym site of this culture), at Tata, a Middle Palaeolithic industry processing also pebbles was found, termed after a German site as Taubachien). In the Szelim-cave, two Middle Palaeolithic communities of entirely different cultural traditions used to take shelter; a population working on medium size quartzite pebbles and later on another industry producing 8-10 cm large bifacial tools made of shiny liver-brown silex (This latter population was named after the Jankovich-cave, lying also in Komárom-Esztergom county).

# Vértesszőlős - Settlement of Early Man

The settlement of Early Man at Vértesszőlős attained outstanding fame among the sights of the place. Professionals all over the world known the name of this village at the feet of the Gerecse Mts. on the strength of this site. Its research history is similar to a lot of other Palaeolithic sites: it was known earlier to geologists, palaeontologists than to archaeologists.

The study of Roman period sites of the region started in the 19th century directed attention to the raw material, preferably used for constructions and stone-carving by the Romans: porous, easily worked, insulating and decorative travertine. The quest for the raw materials sources meant an initiative for the sinter occurrences covering in thick layers the foothill slopes of the Gerecse Mountains.

The formation of the calcareous tuff is quoted here from the geographer Jenő Cholnoky. A more scientific explanation on the physico-chemical processes could be probably given, but none which is more clear and expressive.

*„... calcareous tuff is always deposited covering the vegetation at the bottom of the valley. We all know that in the water containing soluted carbonate, lime is present in the form of calcium bicarbonate, because this is easily dissolved in water. When the water is losing its carbonic acid gas content due to any reason, the calcium bicarbonate is loosing a molecule of carbonic acid and turns back to calcium-carbonate. This common limestone is hardly soluble therefore most of it is precipitated and turns to dripstone in the caves or carbonatic coating.*

Fig. 3. Vértesszőlős, settlement of Early Man

*We know that living plants, especially some algae take up a lot of carbonic acid from the water and the air and therefore we can see on the blocks of stone along the shore of the Balaton lake a limestone coating. Karstic water poured on living plants therefore will lose its soluted lime content and a thick limy coating will be formed.*

*The rotting of dead plants, at the same time, will produce carbonic acid gas. The karstic water getting on rotten plants, there-*

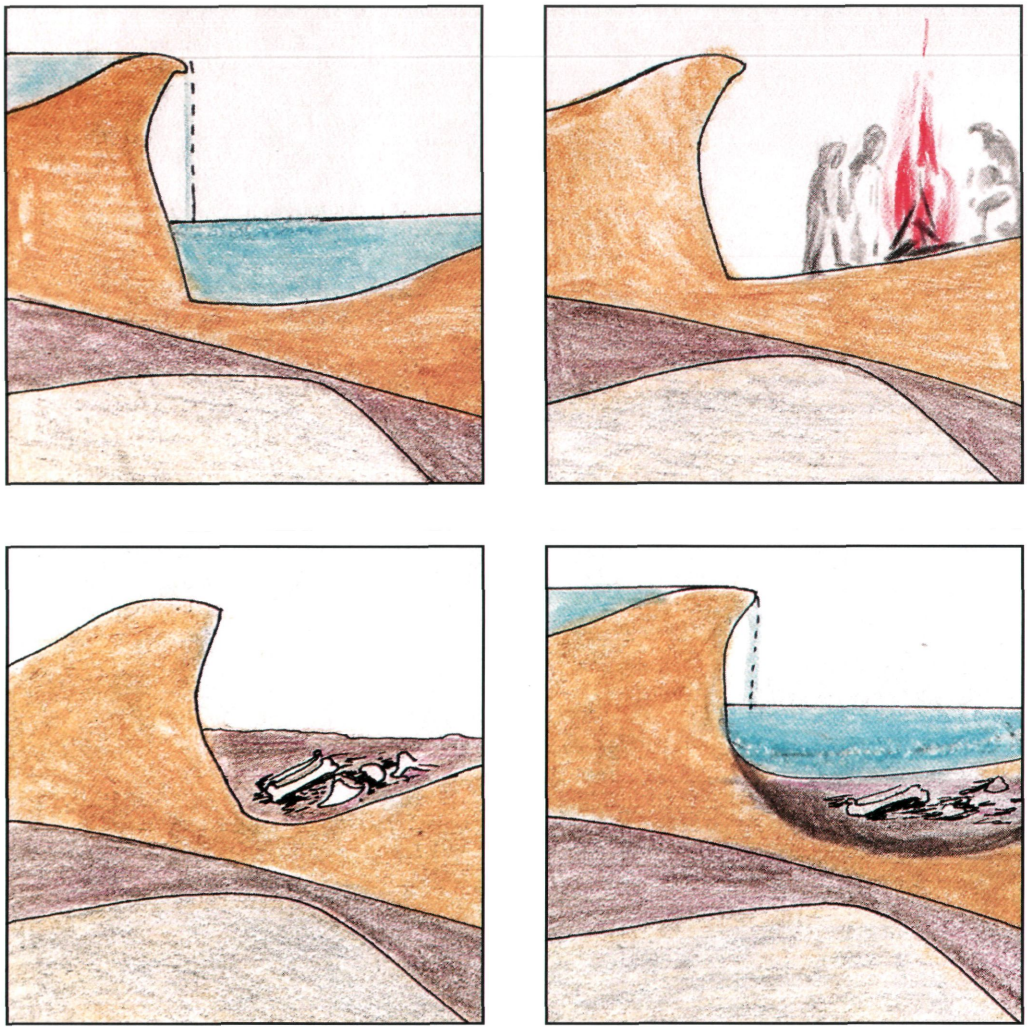



Fig. 4.
Formation of the calcareous tuff and the tetarata-basins

*fore, will not lose its carbonic acid contents but takes up extra quantities and no precipitation of lime will take place here.*

*Let us imagine know that in an uninhabited valley the trees of the wood falling over each other covers the ground with plant waste in thick layer. On this slowly rotting waste, a new vegetation will grow. The water is infesting this whole mess and cannot cement the rotten parts because at those parts the lime with carbonic acid will not precipitate. At the same time, lime is precipitated on the living plants without killing off the vegetation because the roots are fed from below, the rotten plants and the accumulating fine silt between them.*

*The limy crust is slowly getting so thick with new and new generations of vegetation on the top that the roots of the plants cannot work any more and turn limy as a results of infiltrating water.*

*Under the thick deposits of calcareous tuff therefore we find always a great amount of plant waste. These are however slowly disintegrating and the drifting groundwater will carry away the products of decay and on the place of former trunks, heaps of twigs etc., smaller and bigger disordered cavities will appear.*" (*Barlangvilág.* vol. V.,/1-2. (1935), pp. 4-5.)

These cavities render the travertine so attractive as construction material, why layers of barren are worth to detach till they reach the profitable layers. The speed of deposition of the calcareous tuff result in the preservation of the tiny plant details with complete adherence.

The outcrops of calcareous tuff therefore got into the focus of natural science experts, and later on, to the interest of archaeologists as well. This is how attention was drawn to Vértesszőlős in the first years of the 20th century. There were two quarries within the confines of the village: a small quarry along the Tata outlet of road 100, at 140 m altitude a.s.l. and a more important one, a calcareous tuff quarry at the altitude of 170-180 a.s.l., towards the confines of the village facing the village Baj. In the 1920-ies, 1930-ies several publications were published on palaeontological finds collected from here and other calcareous tuff occurrences.

The events started to take a faster turn by the fifties. Viktor Budó and István Skoflek, teachers of biology at the Tata secondary school discovered the rich fossil flora of the quarry and founded a major collection by the plant prints collected from here.

In 1962, Márton Pécsi visited the upper quarry with university students of geography to study the phenomena of the formation of calcareous tuff. In the meantime they became attentive of features which proved to be the settlement of Early Man.

The excavations were lead by László Vértes, and the work lasted till the opening of the open-air museum and finishing the manuscript of the book on the Vértesszőlős

excavations entitled *Kavics ösvény* (Pebble path). A few month later László Vértes died. The elaboration of the finds took several years, the monograph on the site was published in English by 1990.

The site belongs to the few Hungarian Palaeolithic localities that yielded not only a rich archaeological assemblage but also ample scientific evidence. Part of the finds, observations and phenomena help us to reconstruct the living and the inorganic environment of the Early Man who used to live here. This is the task of the natural science experts. The finds related to human activities are elaborated by the archaeologists. Concerning the students of the inorganic environment, representatives of numerous branches of science worked on the site. Geomorphologists studied one of the most spectacular formations of the ice age, i.e., river terraces. The Által-ér, a small stream in our days, used to form its present valley during the thousands of years with considerable work and on the foot-hill slopes, the traces of terraces, these huge steps in the soil can be followed easily. At the beginning of the excavations when the extent of the village was half of its current size the geomorphological formations could be still followed clearly. The new streets and buildings disturbed and covered these forms of the soil surface.

The walls of the quarry exposed by mining were studied by geologists. The material (calcareous tuff, lime silt, loess, sand etc.) and the position of the layers (settled horizontally, vertically, standing on their place of formation or reworked), the structure and composition (grain size, mineral content) and its chemical-physical properties conditions during the formation of the sediments can be deduced. Sediments deposited by the spring, brought by the river or transferred by the wind will be different. The sediments formed in cool and dry, or mild and humid environment will have different characteristics. Investigation of the quarry wall, the survey of the site environs served notable examples on the adaptation capabilities of the groups of Early Men.

The level of the current quarry, better to say, the step of ground/terrace on which the calcareous tuff sedimented, used to be some half million years ago the lowest point of the relief. The precipitation infiltrating the cracks of the Gerecse limestones broke on the surface in a row of springs at the feet of the foothill slopes. Part of the tepid karstic water evaporated on reaching the surface and the soluted minerals were sedimented on the vegetation. The walls, dams sedimented at the margin of the spring cones gradually formed the environs of the spring to a small basin, so-called tetarata. If the water feeding the spring run dry for some reason - e.g., a small movement of the earth stopped the way of the water - than the basins dried out and offered, with their high, vertical walls, ideal places for settlement. Groups of Early

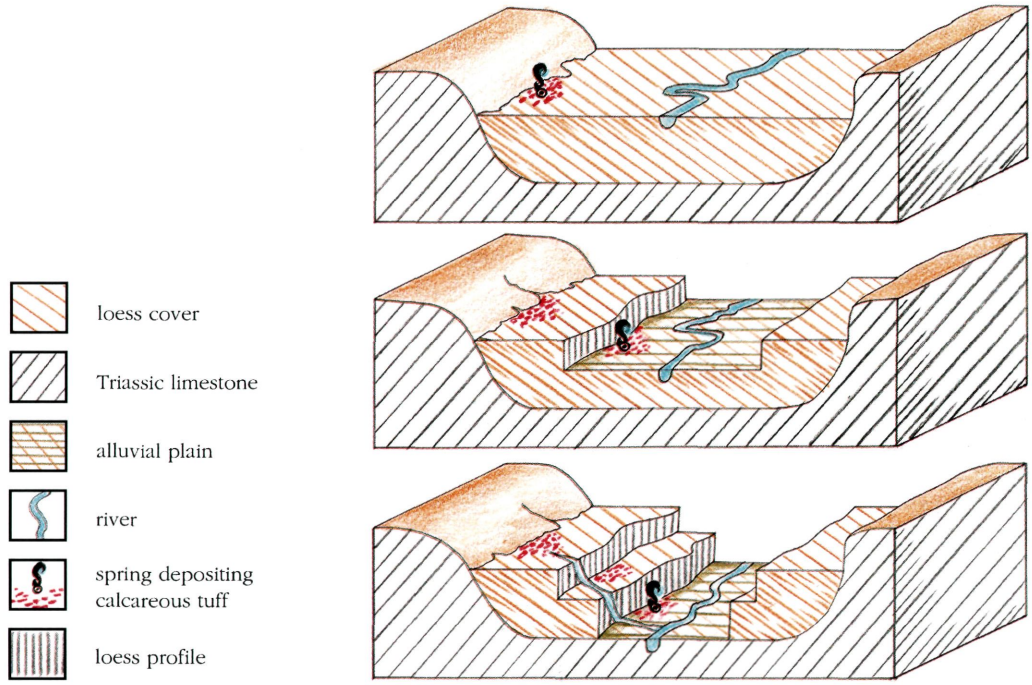



Fig. 5. Model for the formation of river terraces

Men who favoured the environs of the spring - for drinking or finding food - realised this, and this is how the Vértesszőlős tetaratad-wellings came into function. The basins of 8-10 m diameter, surrounded with 2 meter high walls, almost completely dried bottom served for a long time a shelter for the community, probably till the game to be hunted became scarce. Later on the spring activity was started again and it covered the camp site of the Early Man with a 80-100 cm thick layer of calcareous tuff. Later on people returned to the place but only for a short while. The environs of the Vértesszőlős springs offered such favourable conditions for living that Early Men returned at least five times - maybe more - to the same spot, though the traces of their former camp-site was already below thick layers of limestone or loess.

On the drawing, a possible reconstruction of this process is presented.

The study of the inorganic environment and proofs of human activity are connected fortunately by the geologists when trying to

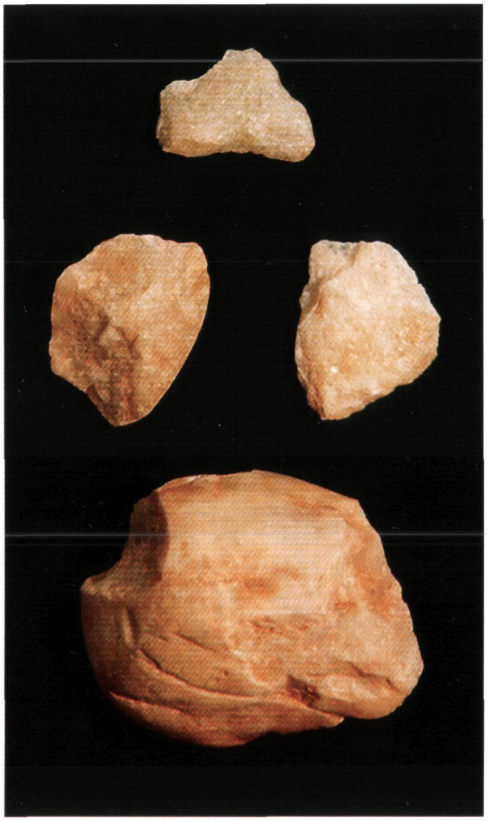


Fig. 6.
Vértesszőlős, lower cultural layer: pebble tools

answer the question, where did Early Man obtain the raw material necessary for their implements. In our case, pebbles of suitable size (very small, 4-5 cm large!), half of them silex, the other half, quartzite was collected from the drift of the Által-ér. They are practically composed of the frittered debris of the Transdanubian Mid-Mountain, rounded and spread by the river in the dry period during the dry periods along the foothill region. These pebbles were chopped, split to cloves or slices (like orange or bread). The cleavage edge of the pebble in itself is sharp and suitable for working but men typically further adjusted their tools in view of the function by retouching.

For understanding the living environment of those times, we have a wide choice of evidence from the microscopic to the giant Ostracodes, for example are very small crustaceans living in the water, marking the temperature, salinity and vegetation of their environment. If we can find types of Ostracodes in dominance within a certain layer that prefer shady, slow moving, tepid and salt-free water covered with vegetation, we can clearly picture to ourselves the formation of the sediment comprising the finds.

Snails are less rigidly bound to certain location but they can indicate the characteristics of the environment equally well. Molluscan shells will give more information because terrestrial and water-dwelling species complete the range of information. The study of small rodents and other small mammals can make a boast of long and fruitful history of research in the Carpathian Basin. Detailed lists of species were made on the basis of samples silted from cave sediments and clefts, thus the small mammal fauna of the individual periods are known adequately.

Thus the new sites can be easily fit into the existing series, which means an at least relative, chronology. The finds obtained from the same layer as the fauna is obviously contemporary in its age. Here let us say a few words about the discussion regarding the age of the Vértesszőlős finds which can be interesting even for the general public less initiated to professional arts.

How old is the Vértesszőlős site?

Let us lay it down as a principle that for archaeologists age is not the only or primary aspect for evaluating a site, that is, one site is not necessarily more important than the other just because of its age. The exact age of the Vértesszőlős human settlement had been a subject of debate since the discovery of the site. Different chronological data obtained by physical and chemical methods and the relation of the finds to the layers dated by the above evidence allowed the expression of extreme opinions. Different measurements and estimations places the age of the Vértesszőlős site among wide boundaries even for the experts accustomed to temporal dimensions of the Palaeolithic, between 200 and 400 thousand years. It is taken for certain, however, that the Vértesszőlős Early Man settlement was formed in a warm-up period of the second, Mindel glaciation. The proofs for this include geomorphological, palaeontological, palaeobotanical evidence. How many thousands of year ago ? The exact dating for this second glaciation termed Mindel

Fig. 7.
Vértesszőlős, leafprints

in Central Europe can differ by the analyses of different samples investigated in different laboratories.

To express it in our technical jargon, the relative chronological position of the site is exactly known (it can be fit into the chronological scheme set on the basis of a large number of sites), its absolute chronological position (i.e., the age of the site expressed in years) can be given only among broad limits.

The calcareous tuff is extremely rich in plant fossils. There were several thousand prints of leaves and fruits, and the pollen remains preserved data on the vegetation from the environs of the springs till the foothill slopes. Deducing from the demands for light, water and temperature of identical or related plants living today it was ascertained that in the time of the existence of the settlements of early men there was a milder, warmer climate here and the January mean temperature did not sink below - 3 $C^{o}$. The rich and variable flora, starting from the small

Vértesszőlős, reconstruction of the flora

1. wild rose
2. willow
3. poplar
4. alder
5. oak
6. elm
7. birch
8. hazelnut
9. fir
10. black pine
11. hornbeam
12. ivy
13. privet
14. vine
15. walnut

herbs with coloured flowers till the tall pines was not only, or not mainly, important for their aesthetical merits, much more for their utility for the people. We have no objective proofs on the utilisation of different vegetal parts but deducing from our current knowledge, many of the plants documented in the fossil record could serve as source of food like wild ancestors of plants cultivated today for their fruit: blackberry, apple, sloe, grape, walnut, olive; - and edible plants that were not domesticated or cultivated, but collected and consumed even today: hips (fruit of the wild rose), hazelnut, sorb; - as well as other edible plants which are typically not eaten today: pine-nuts, fruit of the cedar-tree or the Celtis, acorn.

Fig. 9. Lilac

We can add that in the wet and warm environment probably a lot of edible mushrooms could grow, we can summarise that the vegetal sources of nutrition from early summer to late autumn (from blueberry till acorn and nuts) could be collected here and stored all over the year in suitable quantity, rich in nutrients and vitamins. Opposed to our expectations, no charcoal was found on the hearth-places. Following the happiness felt when evidences for the traces of the use of fire were found, a lot of experiments were made to reconstruct firing practices of the early men. The fire of probably natural origin must have been set or transferred to the camp with wood but the embers were preserved with fat bones broken to small pieces. The high ignition temperature of the bone burnt the wood to ashes. Whatever remained from the hearth-place of the early man is a heap of 30-40 cm diameter large radially arrayed bones burned black.

In the cultural layer of the settlement (the area of former human activity where archaeologists find the accumulated remains, tools, fabrication debris, remains of bones and teeth in intact position) a large number of animal bones were found. Part of the species identified were rodents and small mammals, part of them belonged to large size herbivores or predators, representing different parts of the body. In the attached table, the species

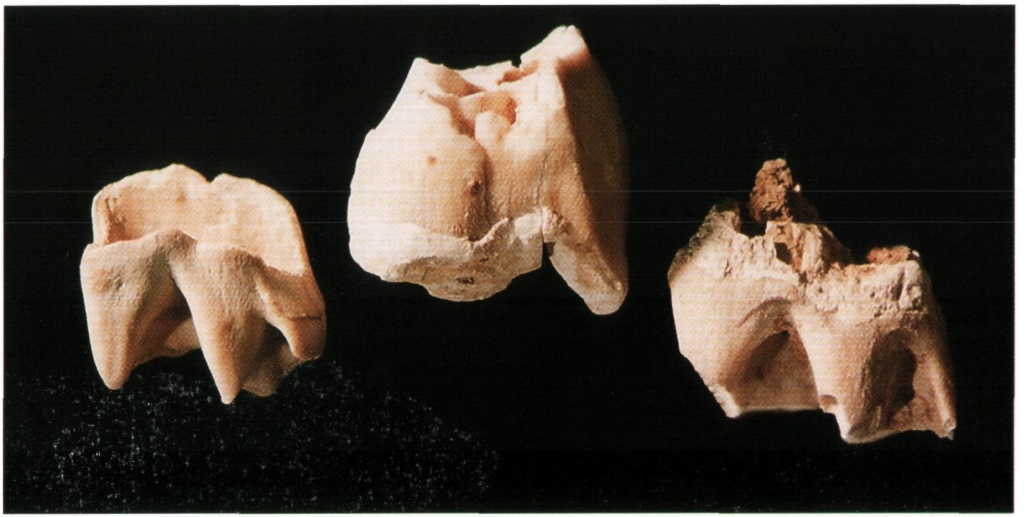


Fig. 10. Vértesszőlős, lower cult ıral layer: teeth of a rhinoceros

important for the site are listed, whether they served for hunted game for the people or they are important for some reason:

- ✧ partly, they have a relatively high ratio in the faunal list of the site indicating an intentional selection by humans, which is an important datum for cultural history,
- ✧ or, they are typical for the geological period and therefore have a chronological value for the evaluation of the site.

The grouping according to potential utilisation reflect our current taste. Deducing from the observations made on recent hunting-gathering communities, any source of protein could be consumed and thus the column for food could be probably more complex.

The calculated/estimated individual number probably stood for a considerably large amount of meat, obviously reflecting the kitchen debris of a larger community living at one spot for a longer period. The important cultural historical question, how they could obtain this large amount of meat we cannot give a proper answer as yet. On the dwelling places of people standing at similar level of development archaeologists have already found wooden poles with pointed tips toughened in fire: they can be very efficient arms. The embedding calcareous silt at Vértesszőlős did not preserve such finds. It is possible that they were collecting the carcasses of animals

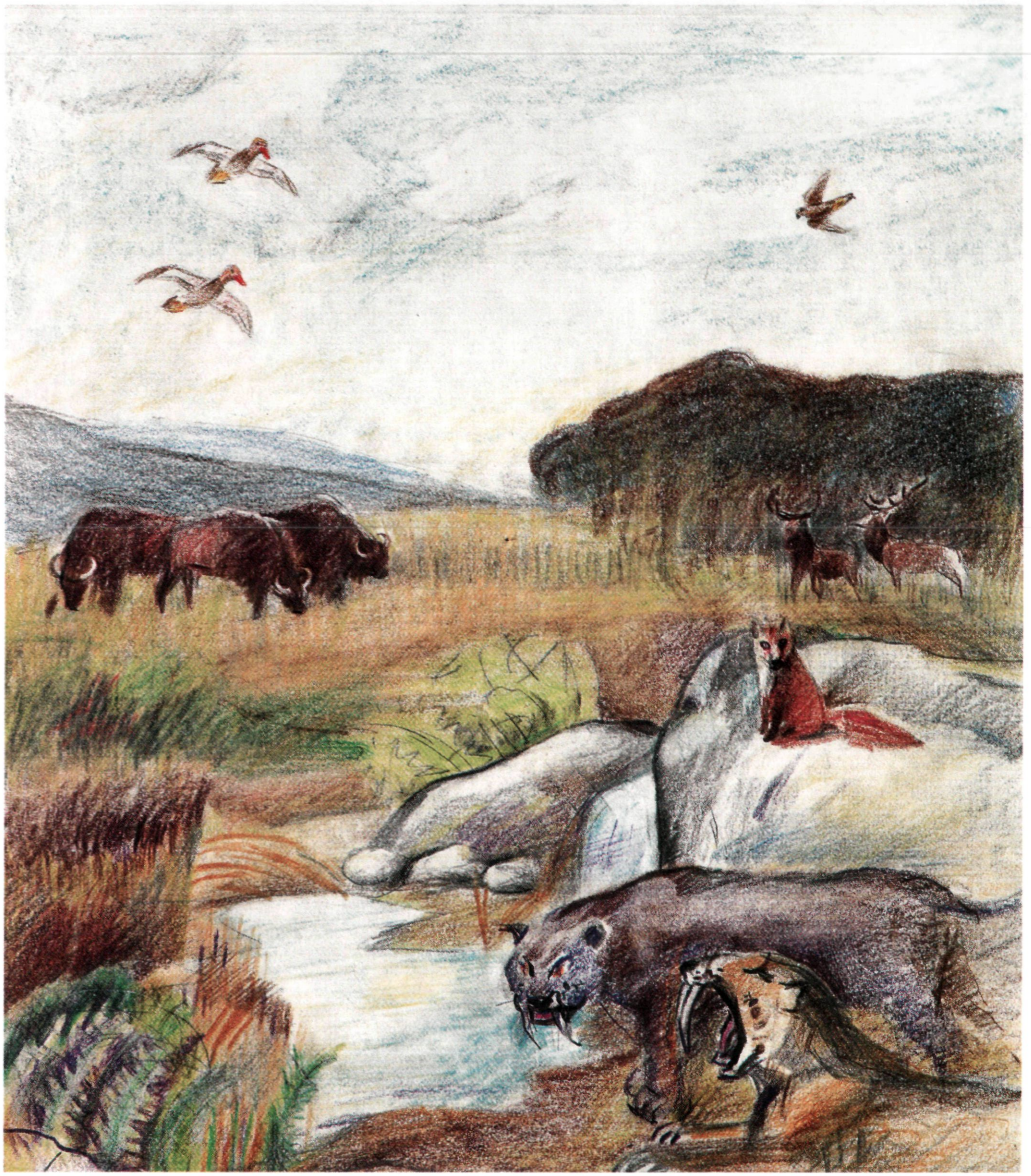


Fig. 11.
Vértesszőlős,
reconstruction of
the fauna

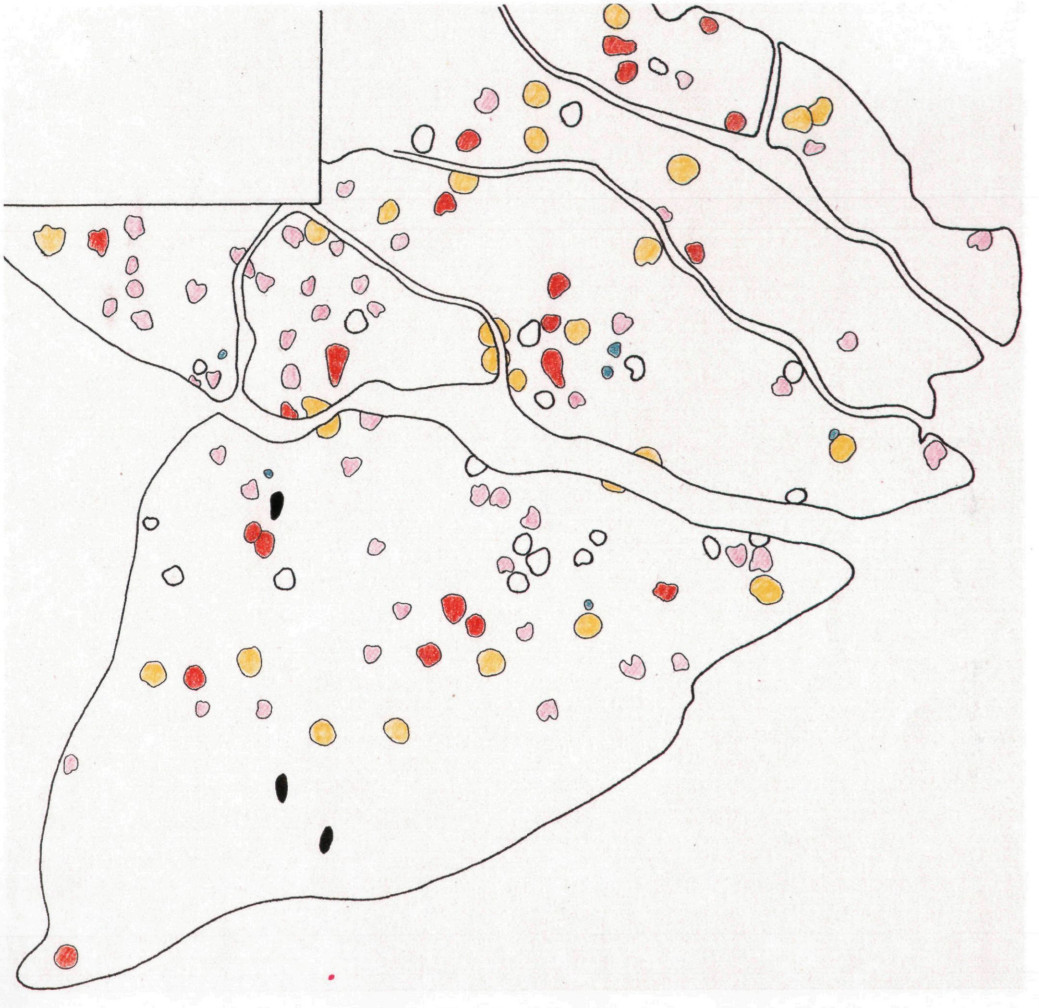



Fig. 12.
Vértesszőlős Site
III., surface with
footprints of animals

Fig. 13. Sorb

falling into the clefts of the area, it is also possible that by joint activity (!), chasing, they actually made the animals fall down. It is also possible that they collected and transferred home anything edible from large distances and that the animal origin protein was also the product of simple collecting. It is, however, clear that the faunal list of the Vértesszőlős archaeological site does not reflect a natural ratio of herbivores/predators that would be observed without the human interference. That is, any way they obtained their meet they were selecting and preferred the meat of herbivores. The contradiction between the size of the tools used by early men (3-4 cm) and the size of the animals on their menu cannot be resolved as yet. It can be taken for certain that none of these small worked pebbles could be used as arms but they are seemingly not very well fit even to the butchering, skinning of large animals with thick skin and great fur as well as splitting the bones.

The presence of the animal word is also documented in a unique way on this site. The surface of the calcareous tuff plane at site nr. III. is covered by animal foot-prints. The conditions for the formation of the prints are clear: the footprints of animals who went to the spring for drinking or wallowing were preserved in the silty mud covered with the walls of the basin. The water evaporated, the fine print of the footsteps petrified and was covered by several meters of loose sediments till the excavation of László Vértes.

The composition of the species deduced from the footprints is essentially different from the ratio of game reflected by the bones. The environs of the natural drinking places is a source of food that could be reached with lesser energy.

Finally some words about the human remains. Vértesszőlős is still the only Lower Palaeolithic site in Hungary where not only the traces of human activity but also man himself was found. During the washing and selection of the cultural layer in 1964, the (milk) canine tooth and fragments of a molar

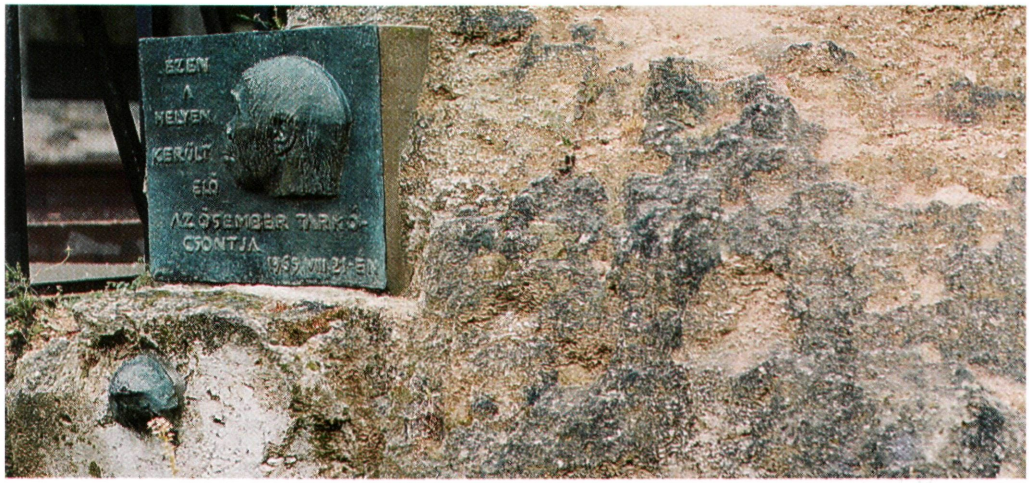
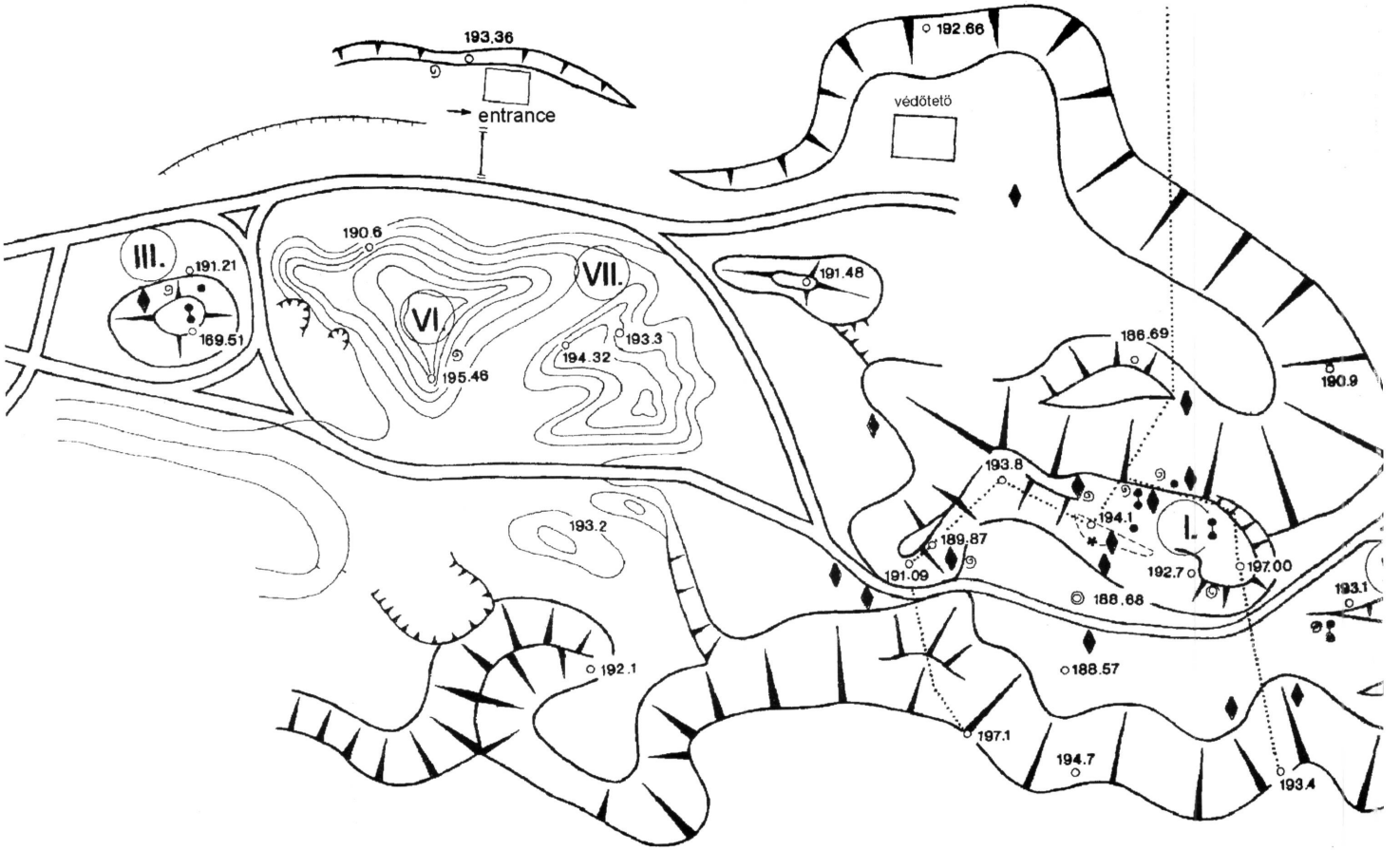



Fig. 14. Vértesszőlős, location of Early Man occipital bone

tooth belonging to a 6-7 year old child were found. In 1965, during the extraction of the external wall of the calcareous tuff basin, the occipital bone of a grown-up man was found. The formal characteristics of the find agree well with other remains of *Homo erectus*, and is especially close to the Sinanthropus remains found close to Beijing. The volume of the skull estimated on the basis of the occipital bone, however, is exceeding the extent of skull volume typical for this period. This fact is a good testimony for the mosaic-like pace of development; proving that the development of the whole human race and that of the single individuals are not of universal force and even pace. The totality of the mosaic pieces will draw the great tendencies of evolution.


193.36
entrance
192.66
védőtető
III.
191.21
189.51
190.6
VI.
195.46
VII.
193.3
194.32
191.48
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190.9
193.8
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I.
189.87
191.09
192.7
197.00
193.1
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193.2
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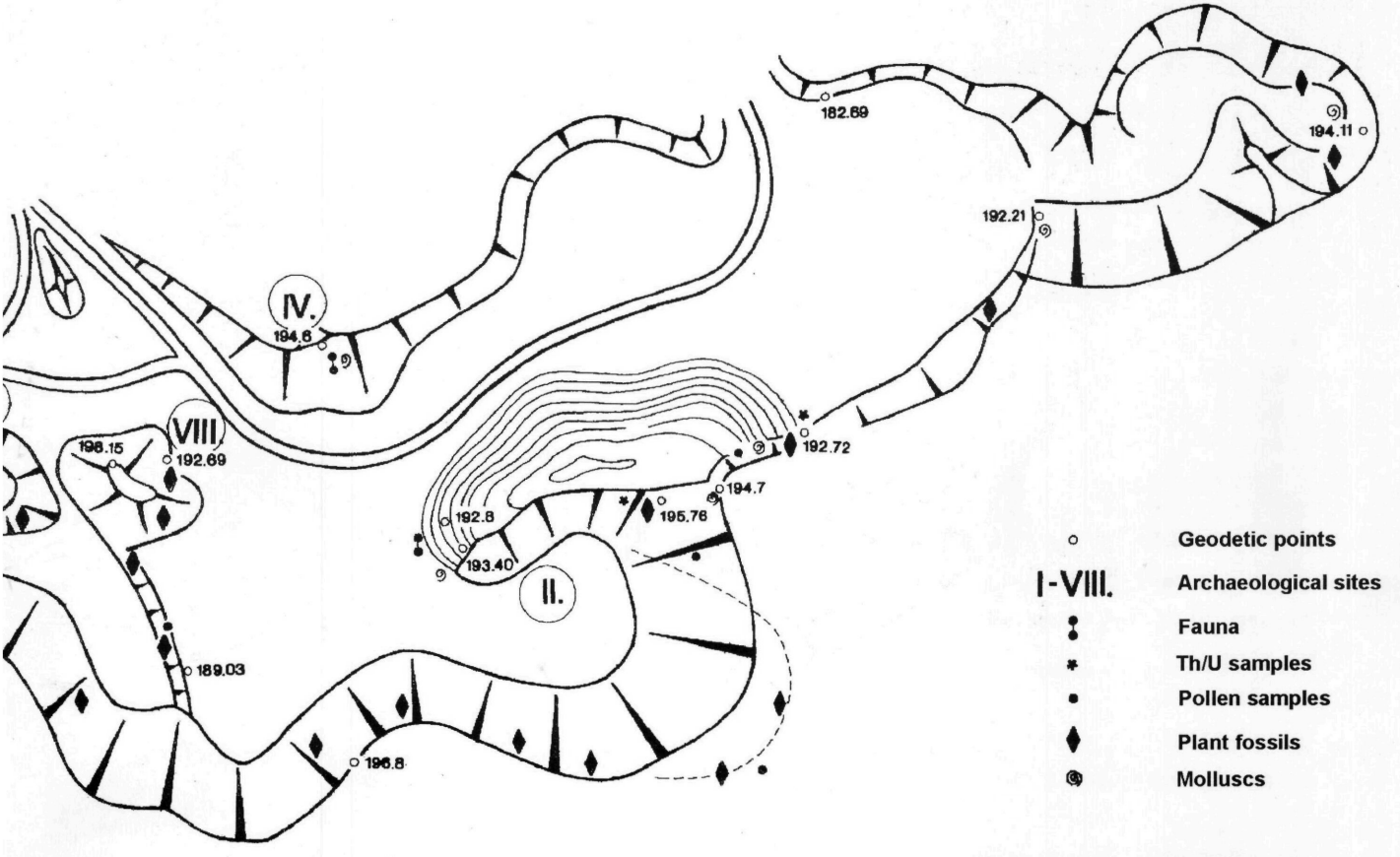
## MAP OF THE VÉRTESSZŐLŐS QUARRY



# Tatabánya - Szelim-cave

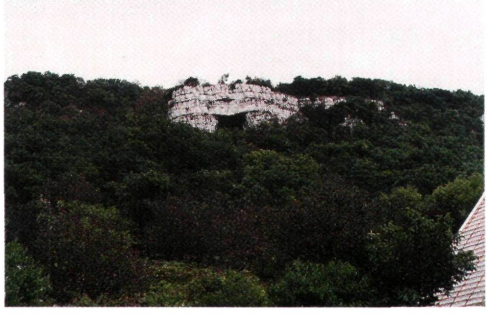


Fig. 16. Szelim-cave

The cave is opening in the almost vertical cliff of the Kőhegy, over the town (the former village Bánhida), at the western margin of the Gerecse Mts., at an altitude about 300 m a.s.l., 130 m above the bottom of the Által-ér valley. The limestone constituting the mountain is liable to karstic phenomena. Meteoric water infiltrating the Mesozoic compact limestone will carve, with physical and/or chemical work, carve cavities into the bedrock, solving the carbonate with acidic solution and abrading the cavities with the drifted debris and pebbles. These cavities can be of variable size and form. The smaller ones are in fact at the beginning of a longer development to become great caves in due time. In the Gerecse Mountains one can find a lot of cavities, shafts and caves. The biggest and most famous one is the Szelim-cave.

It can be seen from afar. Easily accessible, its imposing rectangular entrance with the memorial of the Turul (a mythical eagle-like bird of the Old Hungarians) is an appealing sight. Elek Fényes wrote about the cave it in 1856:

*„Under the rocky mountain crowned with forest there is a large vineyard, facing south on the northern parts of the area, extending to the Alsó-Galla fields as well. In the cliff over the vineyards, the rectangular gate-form entrance of the Szemiluk cave can be seen from the road under the vineyard heading from Tata to Galla and from there, through Bicske to Buda where even today a great number of human bones are found. According to local tradition a lot of countrymen, as the legend says, people from 7 villages sheltered in the cave whom the Turks spotted from the smoke pouring out on the hole at the top, and were drowned here, as the old men of the region still show the traces of fire on the narrow vent."*

Miklós Pápa probably draw information from here or the still lingering local tradition when he published his article in *Barlangvilág*, a standard paper for speleology, tourism and natural history. His article on the

romantic cave contained several moments of local historical interest. In 1943, this is what he wrote:

*„Another notable cave is the Szelim-hole at Bánhida. It is gawping at the side of the mountain where the millenary memorial, the Turul is spreading its proud wings. On its history, there are two versions circulating in popular legends. According to the first one, the inhabitants of the region took shelter in the Szelim-hole when the troops of Soliman (Szelim) were approaching, but they were revealed when searching for water. The Turks stuffed the opening of the cave and set fire on them, so all of them died. According to another less well-known version, the wife and child of a constable, from a neighbouring fortress of the Vértes Mts. (maybe, from Vitány) asked for shelter and water here but the people who were already hiding here turned her off. The woman in despair betrayed them to the Tartars at the Labanc-stream under the mountain but she got killed just the same, and as they could not get inside the cave through the narrow vent of the Farkaslyuk (Wolf-hole), they made a big hole on the mountain top, and the disturbed ceiling of the cave fall down and buried the refugees and brought down the walls of the cave at two places. It was also told about the cave that sultan Szelim buried his treasures there and they are guarded by a dragon with poisonous breath. It is a fact, however, that Hubert Kessler, speleologist, found poisonous carbon dioxide gas in the depth of the Szelim-hole during exploration: was it the poisonous breath of the dragon?"*

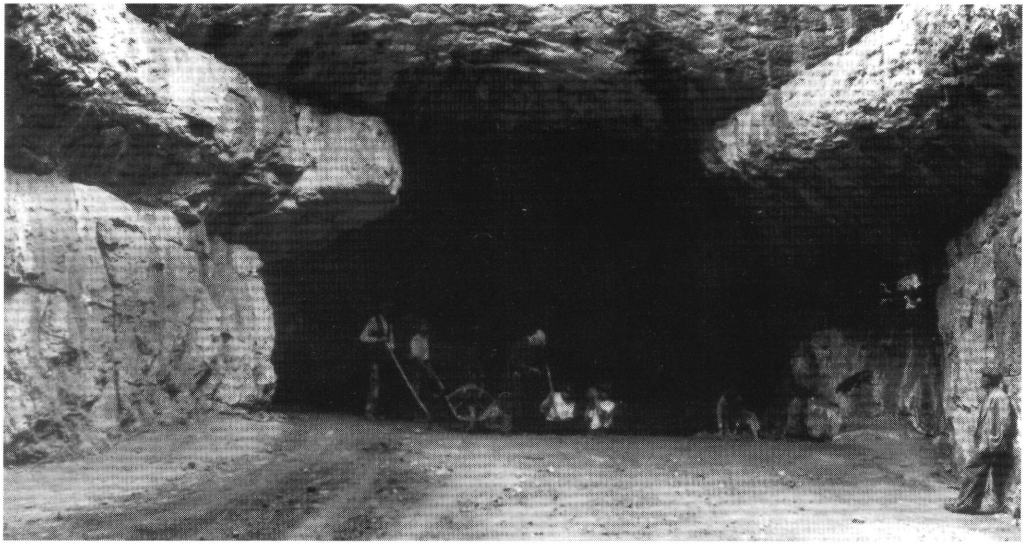
The cave emerged to the rank of an archaeological site relatively late, compared to how popular a place it was and how evidently it was a *„real prehistoric men's cave"*.

Its archaeological exploration started in 1932, Hubert Kessler, tirelessly urging speleological research, opened the first ditch in the cave. The cave belonged to the demesne of the lord of the region, count Ferenc Esterházy. The results of Kessler induced István Gaál to start regular excavations here.

In 1934, the Natural History Research Council supplied the financial conditions for the excavation, which turned far deficient compared to the task. The continuation of the work could only be imagined with a financial background produced by joint efforts. Let us quote here now, when conditions of practising science with no apparent economic use became again difficult both in research and publication, the list of respectable supporters of the work in the Szelim-cave:

*„On the basis of the situation and the tangible results achieved so far, the support of the Cultural Administration, later Jenő Vida, general director of the Hungarian State Coal Mining Co. and Konrád Rebling, counsellor of mining affairs, moreover Béla Bagossy and Pál Péchy, director of the Bánhida Power Plant, Frigyes Dőry, owner of the Paradicsom-*

Fig. 17-18. Excavations by István Gaál (archive photos)



*puszta manor and mainly - with the effective mediation of József Láng, notary - the local government of Bánhida could be ascertained. The stately list of supporters prove that even during the most severe economic condition interest can be raised towards important scientific questions. We only have to kindle their interest."*

The dimensions of the cave are most imposing: its length exceeds, according to the measurements by István Gaál, 50 m, its width and the thickness of the sediment is more than 12 m. The sediments rich in archaeological finds were extracted during some months, in most of the cave till the bedrock.

Knowing well that our own work will be considered as hasty, superficial rescue excavation it has to be mentioned that in the Szelim-cave a great chance was lost by the exploitation of the cave deposit, with their concept *„as much and as fast as possible"*. We can only hope that most of the evidence was found and became accessible. The observations on the stratigraphical position of the finds, however, were lost forever by the *„crash program"* style excavation.

Even though, the cave is one of the most important Hungarian Middle Palaeolithic sites. Its exceptionally favourable geographical position, spacious interior room especially suitable for human habitation offered shelter to prehistoric man in several periods of the Palaeolithic period.

The excavation of the cave was started by István Gaál with the extraction of the rear parts. The parts of the cave close to the entrance were re-worked and leached, the vast aperture on the ceiling broke open, rendering the cave so spectacular today, did not protect it from exterior influences. As the excavator told us, the transformation of the environment was continued during the excavation:

*„Here we can mention that the eroded and at the same time steep bottom of the first part of the cave made us possible to dispose of most of the ground, extending to some 2000 cubic meters, extracted from the interiors of the cave.*

*Some 400 $m^3$ mass of sediments were carried out on a third aperture widened by explosion for this purpose. Namely, this mass of ground could not be poured on the stripe of forest ornamenting the steep slopes. The trees would be spoilt and the large blocks of limestone, sometimes weighing more than several hundred kilograms would destroy the vineyards immediately under the slope.*

*Among the blocks of limestone falling off from the ceiling, some were as heavy as 48 hundred kilograms, even 64 hundred kilograms. This could only be disposed of by explosion and fritting."*

István Gaál separated the sediments into five great units, the uppermost of them sedimented in the Holocene, the others in the Pleistocene. The uppermost brown soil rich

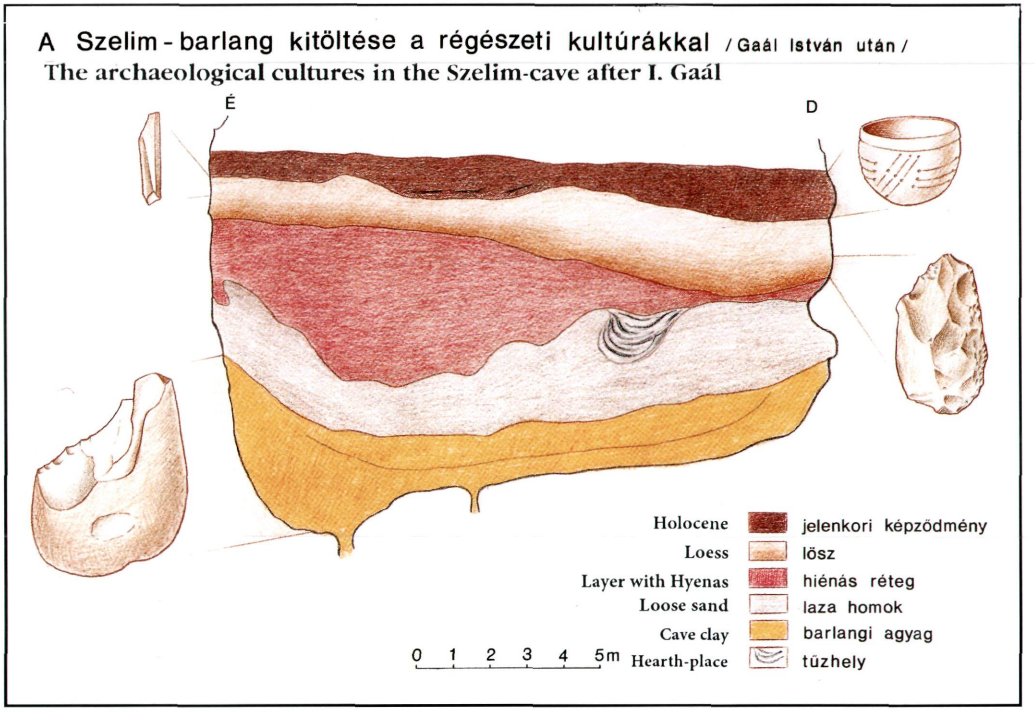



Fig. 19.
The layer sequence in the Szelim-cave

in humus contained, from Mediaeval times till the Neolithic period backwards variable finds. The excavator considered the core of the Szelim-legend in the human bones belonging to 14 individuals found in the sediment. There were no grave goods, thus the date of the burial could not be ascertained but the skeletons disturbed while rummaging for hidden hoards were suitable to support the legend of the seven villages destroyed.

The colour, composition of the sediments formed in the Ice Age, the form of the embedded calcareous debris and mainly the animal and plant remains are important witnesses of the former climate and the organic and inorganic environment even for posterior generations.

Under the humus of the Holocene the period of the „*real prehistoric men*" was reached. The thickness of the yellow sedi-

ment transported by the wind called loess extends to, on the average, some 1,5 m in the cave. It could be separated into two parts. The younger level was formed by the end of the Ice Age and seems to be coeval with the range of Upper Palaeolithic open-air sites excavated on the high loess terraces along the river Danube. Some 18 - 20 thousand years ago, the interior parts of the Carpathian Basin were covered with dry loess-steppes, and large herds of reindeer and wild horses were grazing on them. These were the most important game species for the prehistoric people. The dry, cold and long winters alternated with short and cool summers, the vegetation period was not more than four months and the annual average temperature was 3-4 degrees below that of today. The wood for the camp fires could only be collected along the slow rivers of meagre water discharge or on the protected hill-slopes: pine trees, willow and birch has been identified from the charcoal collected from the hearth-places of the settlements. The few stone implements collected from the relevant layers of the cave seem to be identical with the material of the north-east Transdanubian open air sites. These hunters of the Late Ice Age used to live in round base tents probably covered by animal hide on the high terraces along the Danube, utilising the route and the regularity of the wandering rein-deer herds, performing seasonal hunting for some weeks around the shallows of the river. They were obviously

Fig. 20. The interior part of the Szelim-cave

using the shelter offered by caves and could used the Szelim-cave as well for their temporary camp and deposit.

On the top of the loessy layer, 3-4 cm long, slender implements made of high quality raw material were found. These stone tools resembling and in fact called blades could serve as working tools and arms, both in themselves and also fit into wooden or antler hafting. The few pieces found in the sediment of the A Szelim-cave were probably accidental remains of a short stay: no signs for the production of the tools, neither for a longer stay of the hunters could be found in this layer of the cave sediment. What was actually found is a pendant made of pierced canine tooth of a wolf, a characteristic example for the generally spread jewellery of the period. Trinkets were stringed, made of teeth, pretty pebbles, ornate shell of Tertiary snails for the decoration of their body or their garments.

Fig. 21. Pierced amulet made of wolf-tooth
(Szelim-cave, upper cultural layer)

Fig. 22. Leaf-shaped side-scraper
(Szelim-cave, Jankovichian culture)

The technique of piercing is exceptionally well observable on this piece. The strong root of the tooth was minced by scraping and grooving and the thinned bone plate was pierced. After this, the hole was carefully rounded. It was a longish, minute work and the result is attractive.

We are travelling back a long way in time. On the bottom of the same yellow loessy layer we find bones which tell us about an entirely different climate. The beautiful tool found here by the excavator was made by other people, standing on an earlier phase of development in human culture. The man was a Neanderthal man and the culture belonging to one of the cultures of the Hungarian Middle Palaeolithic. It is 30 - 40 thousand years older than the few blades found in the upper loessy layer. The hunters producing the beautiful knives, scrapers, carefully worked lance-heads, worked on both sides, made of shiny liver-brown silex used to live in the caves of the north-eastern parts of Transdanubia during the initial phase of the last glaciation (Würm). These tools were their typical working implements and arms. They were named by archaeologists Jankovichian culture, after one of their sites, the Jankovich-

Fig. 23.
Szelim-cave: fauna

cave in the Gerecse Mountains. The climate was getting gradually more severe, dry, and in the forests pine-trees became dominant. These changes were not sensible to the individual persons, becoming apparent only after generations. The constant deterioration of the climate pointing towards one direction lead to the first cold maximum of the Würm period. Probably, during the cold-continental, subarctic climate period, the Szelim-cave offered shelter to these hunters.

The hunted game differed essentially from the fauna of the younger layers. The Upper Palaeolithic hunters were chasing animals that populate, though under different ecological conditions, significant areas even today like the reindeer or caribou, and even if they are getting extinct this is not the result of the changes in climate but that of the *„blessed"* activity of man (e.g., wild horse). The hunters of the Middle Palaeolithic Jankovichian culture were fighting against animals which became extinct several thousand years ago. The dominant species of the period around the cave were cave bear and woolly rhinoceros. The latter one could only get into the fauna of the cave as a booty, but the cave bear, being naturally a cave-dweller himself, could also belong to animals arriving to a natural death in this cave.

Scraping away the soil of the cave further on, under the yellow loessy layer housing two basically different Palaeolithic cultures, a brown layer of uneven but considerable thickness was found. Its thickness surpassed, at certain points, 4 metres. The accumulation of this layer could take a long time. From the archaeological point of view, however, it was very poor, only some fragments documenting human habitation were found by István Gaál. On the other hand, however, the fauna was exceptionally rich.

This is how the excavator commented about it:

*„In respect of fossils, probably this is the most outstanding layer of the Szelim-cave. While parts of the cave loess were practically void of fossils, in this brown clay we could find an unusually rich assemblages of animal bones here. The long bones were split here as well, which is undoubtedly the sign of human hands. And whereas the most frequent species here was cave bear, cave hyena follows in not much smaller quantities. This latter mammalian species occurred, apart from this layer, only in layer B and in very small quantities, we find that hyena is specially characteristic for the formation conditions of layer C, thus he shall refer to this layer in the followings as „layer with Hyenas".*

*As it was mentioned above, in the layer with Hyenas a large number of animal fossils were found. Cave bear undoubtedly dominates the fauna. At two places in a sack-like depression carved by the inhabitants of the Szelim-cave into the grey sandy bottom of the contemporary cave, almost all bones of one animal were found in one heap, at both pits.*

*Apart from the cave bear and the hyena, all other mammals could get on the hearth-place of the cave-dwellers in one or two exemplars only. Such rare booty comprised primeval elephant, primeval rhinoceros and two forms of horses, a medium-size and a large size type..."*

Under the layer with Hyenas, there is a grey sandy layer of two meters thickness on the average with extremely few number of finds. Though according to the excavator, the character of the cave sediment indicates an aquatic origin of the layer, it can be hardly maintained due to the orographical position of the cave. Not even allowing that the absolute altitude of the cave is identical with some river terraces along the Danube. Under the grey sand, that is, preceding its formation, a much younger sediment was formed than the comparable terraces of the rivers.

Sedimentation of this layer must have also taken some ten-thousand years. When reaching the lowermost layer complex, layer E comprising the well-known finds, we are back some 70-80 thousand years in time.

The climate is still pleasant, the slopes are covered with deciduous forests. Bones of mammoth, bison and giant deer came forth from these layers - they were, in all probability, brought here as hunted booty. Again we have cave bears, part of them could die here in a natural way. The archaeological material of the layer belongs to the Middle Palaeolithic period, the heritage of another group of people with different tool-making tradition. These hunters made their coarse tools with zig-zag edge using 10-12 cm large globular quartzite pebbles. Objects functioning as arms were not observed, but the rich vegetation could serve raw material for a variety of arms and tools as well, which did not remain to us. Further settlements of these pebble-using Neanderthals are known also from the north-eastern parts of Transdanubia, their most famous site is Érd.

Summing up we can say that the Szelim-cave used to serve for habitation of the prehistoric people almost continuously during

Fig. 24. Fir

the last hundred thousand years of the Ice Age. Apart from the sporadic finds which are not adequate for cultural classification, the cave was inhabited for considerable time in the following three periods:

- The first inhabitants used to live here by the end of the mild period preceding the last glaciation (Riss-Würm interglacial period). These Neanderthal men used quartzite pebbles for the production of their tools. They were not typical cave-dwellers in this region. They collected raw material for their tools in the drift of river valley and often settled in travertine basins (Tata) or shallow valleys (Érd). The scanty amount of finds compared to the thickness of Middle Palaeolithic period sediments here, in the Szelim-cave also indicate a short, transitional use of the cave. Part of the animal bones found in the cave also belonged to species favouring the plains and probably got into the cave as prey.

- The next culture in the Szelim-cave is still belonging to the Middle Palaeolithic period, representing the heritage of the *„leaf-point people"*. Their traces are typically found in caves opening the margin of mid-mountains (like Gerecse), facing the plains. So far no open-air settlement of this population is known, though in the opinion of the excellent student of this culture, Vera Gábori-Csánk the deficient tool kit, the reworked, refreshed tools indicate a transitional winter camp. In their booty we find a higher ratio of mid-mountain species though due to the *„liberal"* excavation technique, traces of hunting specialisation cannot be proved in the case of the Szelim-cave. The excellent material for their stone tools was also obtained from the mid-mountain environment. The two cultures coming from the of the old layers of Szelim cave (with pebble tools and with leaf-shaped tools, respectively) belong culturally to the same level of development, i.e., the Middle Palaeolithic but both of them have different roots, predecessors, successors and traditions. In this early phase of history, *„the same level of development"* does not necessary imply that they are really contemporary cultures. The terms *„coeval"* of *„living together"* can be understood in a geological perspective. Archaeological sites are described as *„contemporary"* if they were deposited in similar climatic conditions, found with similar scientific evidence like the two Middle Palaeolithic industries of the Szelim-cave, whereas it is clear that between the two groups following each other in the layer sequence of the cave several dozens of generations could well have passed.

Finally, the youngest Late Pleistocene layer yielded a few stone blades and a pierced tooth the direct analogies of which are known from the settlements of Upper Palaeolithic rein-deer hunters living along the terraces of the river. On the basis of phenomena observed at other localities we can think that the cave could serve as a fur-deposit and hide-processing site of the Upper

Palaeolithic communities hunting successfully in the neighbouring area.

By the end of the Ice Age, in the Holocene period, food producing (Neolithic) people appeared: this story and the younger finds of the cave, however, are outside the scope of this booklet.

# Tata - Porhanyóbánya

The city of Tata is well-known for its monuments and springs. It can boast of, however, another type of curiosity which is neither spectacular nor known to many of us. Tata is one of the oldest recognised palaeontological localities in Hungary. The English traveller R. Townson visited Hungary in 1793 and published an itinerary on his journey in 1797. In this little note, apart from making an absolutely adequate account on the formation of travertine that leaves not much to complete even today (travertine is formed by carbonatic incrustation of plants, with fossil vegetation preserved like mosses etc.), he gave an account on fossil bones found here as well. His guide used to mention that some years before his visit, teeth of elephants were excavated from here. The size of the teeth were 8-9 feet, that is, in our present vocabulary, they could only be mammoth tusks. He reported also that the town was built on a red cliff which can be studied today at the open-air Geological Park under the water tower.

Bones of mammoth were mentioned from here several times during the next century; real archaeological results, however, had to be waited for till 1909.

This is how Tivadar Kormos, excavator of the site reported on the first excavation of the site:

*„In the month of February 1909, bones of large fossil mammals were found in the calcareous tuff quarry of the Tata Esterházy-demesne during mining operations.*

*On the hearing the news, the author of the present lines immediately travelled to Tata and saw there, to his utmost surprise that on the place of the new outcrop a thin, sandy-limy loess-like loose sediment is intercalated into the seams of the calcareous tuff containing pieces of burn bones, charcoal and silex flakes while on the bottom of the upper calcareous tuff layers, immediately overlying this loessy layer, huge mammoth bones were embedded in the limestone.*

*By the end of May in the same year scientific excavations were started here under my direction, lasting in the first year for one month, on the spring of 1910, nearly two month and were also finished. The result of this work is my study entitled „A tatai őskőkori telep" [The Palaeolithic settlement in Tata], the main statements of which are the following:*

*It was ascertained that on the place of the finds the operation of thermal springs were stopped for a while in the Ice Age and during this time, a small, dry, grassy space was formed here on which prehistoric people settled and camped there for a long time. Their primitive stone tools and their „fabrication"*

Fig. 25-26. Tata-Porhanyóbánya

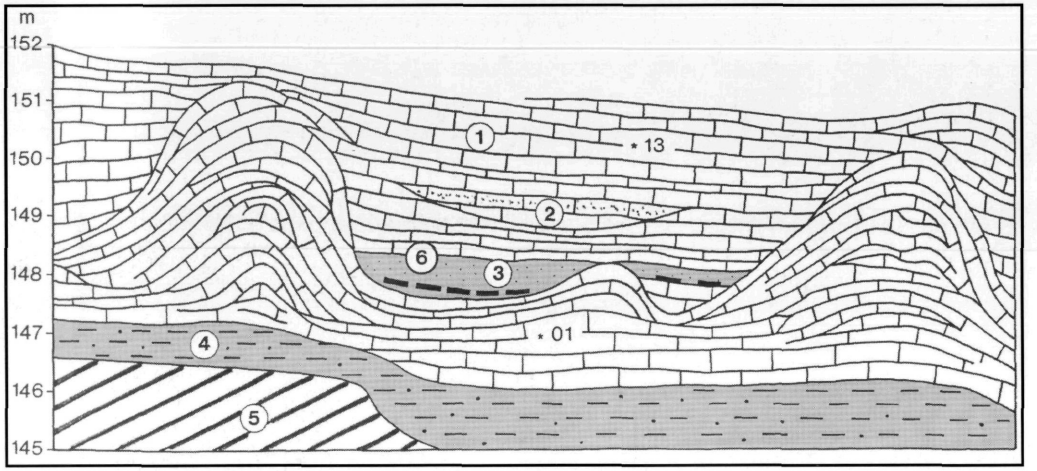



Fig. 27..
Tata-Porhanyóbánya, structure of the calcareous tuff (after Márton Pécsi)
(*sampling point for dating; 1. calcareous tuff basin; 2. calcareous silt; 3. sand; 4. terrace gravel and sand; 5. Triassic limestone)

*debris was found in large number in the loess settled among the calcareous tuff layers. Traces of the primeval hearths were also found in the loess and the animal bones revealed the contemporary fauna living in the environment of the prehistoric people. Most of the bones originate from mammoths and mainly young calves of them, thus it is obvious that this pachyderm was the most typical game, at the same time, main source of food for the prehistoric hunters here. Prehistoric men could not make much harm in the huge pachyderms with their lances or bones armed with unshapely small points made of broken pebbles, therefore they had not much choice but trapping the mammoths and the rhinoceros. It is only natural that mainly the young inexperienced animals were captured. In Africa, but mainly in India, where elephant is often trapped even today, mainly also the young specimens can be intercepted this way.*

*A few steps from the Tata loess settlement under the playgrounds of the Piarist gymnasium there is a small cave where we could also find animal bones. I think it probable that the mammoth hunters camping here took refuge from the cold of the winter in this cave. Later on the springs inundated again the space that was dry for a short while and the prehistoric people left the place. Traces of their presence here was covered by thick layer of calcareous tuff in the course of time.*

Fig. 28. Excavation of Tata-Porhanyóbánya (archive photo)

*The settlement of the Tata mammoth-hunters is the oldest human habitation site known from Hungary and due to the conditions of settlement, it is an unparalleled find all over the World."*

Following the few decades after the excavations, the finds of the Tata Porhanyó-quarry were often quoted in the archaeological, geological, palaeontological technical literature.

In the spring of 1958, László Vértes restarted the excavations of the site, in the way described in the chapter delineating the biography of István Skoflek.

The site is located in the thick calcareous tuff under the Tata secondary school. In the side of the ditch encircling the sports grounds, an aperture of 60-80 cm can be observed in horizontal position. This cave-like appearance, however, is only a semblance because the bottom of the ditch used to be the walking level of the former stone quarry. The yard of the quarry, neglected and used for the accumulation of communal

Fig. 29. Tooth of a juvenile mammoth (hunted game)

debris for several decades was straightened up by the Gymnasium and under the artificial level formed this way the original quarry yard looks like a ditch.

The two metres wide, flat aperture is widening into an irregular flat cavity. Between the two horizontal limestone layers we can find the sandy-loessy loose sediment containing the archaeological finds. The narrow space did not allow a traditional archaeological excavation with exact documentation. According to the testimony of the original excavation photos, the interiors of the cave were washed out by fire-hose.

The original layer sequence can be reconstructed on the basis of the test-wall left by Vértes from the original sediments. This test-wall has, unfortunately, crashed down to considerable degree in the past few years. Curious visitors cannot resist the temptation of the cavities and leave many objects there which has no place here. Apart from making an injury to the scientific evidence by destroying and pollution the finds and their environment, they are also facing life danger because any time some blocks of calcareous tuff can get loose and fall off the ceiling. During the excavation of László Vértes, the uncertain cover was supported by columns set of mine logs during the working period. It was worth the effort: finds far surpassing in number and value that of the former excavation were found.

The finds were published in a bulky monograph. The multi-disciplinary problematics raised by the site was dived into by a range of specialists lead by the excavator, László Vértes.

Tata is the site of contradictions. Within the fossil evidence we find species tolerating cold climate and some definitely preferring warm climate. Among the plant remains we find mosses and water plants, herbs and wood-forming arboreal species. The most frequent game was the mammoth, however the size of the biggest tools used for working leather hardly exceeded 3 cm (!). In selecting a date for determining the chronological position of the site, we can chose from dates ranging between 33 thousand and 100 thousand years.

Some of these contradictions can be resolved, some can not. We cannot explain,

Fig. 30. Pebble tools

for example, why the prehistoric people settled in the calcareous tuff basins were contented with their tiny tools when they had to deal with such huge animals like woolly rhinoceros or a mammoth. We can suppose that they disposed of lances with fire-trained tips which disappeared in the course of time, but the butchering, skinning of the prey and the preparation of the hide must have demanded a hard and lasting tool-kit.

Other contradictions can be, to some extent explained though not fully resolved. The most powerful arguments are the position and former environment of the site. The geographical position of the site explains why remains of animals and plants with different ecological demands could be mixed within the remains of one site. The valley of the Által-ér connected the Tata basin with the mid-mountain environment, the foot-hill row of hills of the Gerecse Mountains are close to the site. The valley of the Által-ér lead the animals preferring forestal environment to the plains while to the west of the site the prehistoric hunters could have their selection from the herds animal world of the dry, grassy steppe.

The tepid springs functioning in the environs of the site created a pleasant environ-

Fig. 31. Pebble tools

ment. Taking into consideration the demands of temperature, sunshine and precipitation, the average July temperature of the site during the existence of the Palaeolithic settlement could be around 19 °C. Thus it is understandable how small rodents or molluscs definitely preferring warm climate could get into the soil of the site.

Summing up we can say that on the site at the meeting point of the Mid-mountain region and the plains, the steppean and the forestal fauna were mixed while the mild local climate of the tepid springs and the vegetation of the cooler hillside was mixed in the pollen samples of the soil.

More specifically, the most important game of the hunters were young individuals of large-size mammoth, woolly rhinoceros, wild horse (steppean animals) as well as red deer and wild boar (forestal animals). The hearth-places of the hunters' site would have as fire-wood pine, elm, hornbeam and oak, the wind could transport the pollen of mo-sses, reed and sedge sás preferring water

Fig. 32.
Tata, fauna

environment as well as willow, aspen and birch.

The stone tools were made from egg-size pebbles. These were smooth cortexed silex and quartzite pebbles collected from the drift of long passed rivers. The form and quality regulated the flow of tool production just the same as at the lower palaeolithic site Vértesszőlős. On both sites, people used pebble raw material therefore in spite of the several hundred thousand years distance in age the basic tricks of knapping were similar. The pieces and flakes of pebbles cut into cloves-segments or slices are sharp in themselves. The sharp base-form was further elaborated by small blows, i.e., retouch. This is how their sharp tools with one, two or three working edges were formed. The working edge could be straight, convex, concave or denticulated. Traces of these retouching could be observed sometimes on the whole surface, sometimes on one or two planes of the tools. The artefacts produced were small but perfect for their specific purpose, as they were seemingly produced in large series. This fact let us suppose that they were fit for their aims.

István Homola, himself with great practical knowledge on (modern) tool production and use examined the function of the Palaeolithic stone tools. His experiences were summarised in the followings:

*„Palaeolithic men needed tools, artefacts for their hunting-gathering way of everyday life. „Tool" is a worked piece, object, product that was made following a pre-meditated ideal by the help of other tools for fulfilling everyday demands.*

*The tools used for the production of other artefacts were made of stone or other materials harder than the one in preparation, suitable for detaching chips, operated by human force, specially fit for the different phases of work (e.g., tool-artefact, Werkzeug-Gerät). By the help of these tools raw materials of their environment - timber, bones of hunted animals, antler and horn as well as hide could be worked more easily.*

*All tools are artefacts but not all of the artefacts are tools. There is a strong interference between the two concepts. We can study, however, only the stone tools or the stone part of the tools because the other ones perished.*

*Human culture is based on experience, resulting from technical development and handed over by generations. The same relates to tool production and knapping (slivering) as basic human activities till our days.*

*Several industrial products and household goods are still made by these techniques. Planing, boring, carving, engraving are parts of this process with rules and regularities fixed during the millennia. Today's machinery for slivering make the same operations like hand-tools did before, only they use more edges, less human power and they are more efficient.*

*The process of detaching flakes by slivering originated from the traditional hand tools. As the human needs for raw mate-*

*rial were supplied for long time by vegetal, animal and mineral resources, mostly bone and wood, most of the hand-tools were made to work on these materials. Their form and cutting edge were designed to fit the working process they are used for. The cutting edge of tools and the hardness of the material elaborated is interrelated and taken into consideration even today, a basic knowledge we can justly suppose to be in possession of our ancestors as well. The form of the tools originated on the basis of millennia of experience, the cutting edge and angle is made to fit the material it is applied on. As a general rule, a harder material should be worked at with steeper edge, the soft materials with more acute angle.*

*Apart from traditional methods of typology, I have tried to study the function of tools and the tool-planning, tool-producing activity by a new method of analysis. Palaeolithic men knew well the regularities of selecting the correct cutting edge, valid also in modern slivering technology. If we can prove this, the role of a range of hand tools can be identified on stone tools as well. The angle, position and form of the working edge will determine the specific action (engraving, boring, decorating) performed on the object under processing. We can identify the tools actually used for slivering and from the use-wear on the edge of the tool we can estimate working hours necessary for their production and force used in manufacturing them.*

*The modern hand-operated slivering tools are typically composite pieces. From the working edge till the hafting tang they are typically made of the same material, and the edge is occasionally sharpened, hardened separately. The hafting is made of softer, more elastic material, typically, of wood, to resist blows and shocks received during slivering.*

*Judging from the size and form of the stone tools, part of them could be tools used separately. The form of the simple (not composite) tool is practical, fitting in the grasp of the hand. Firm grasping is secured by convenient retouch, to transfer the force of the working man with the smallest possible loss.*

*Another part of the tools, especially small ones used - judging from the angle of the cutting edge - on hard materials could only be part of composite tools as stone inlays. These inlays could be stuck to wooden handle, perhaps bone or antler hafting using resinous materials or natural protein-based glues. The pressing force resulting from slivering could be occasionally used for fixing the edge into the hafting.*"

Some of the small objects are beautiful even according to our modern aesthetical principles. The original function cannot always be identified even by the experts: thus our judgement is not influenced by practical aspects, i.e., a beautiful object is perfectly fit for its task. Thus our only aspects are the beauty of form and the finesse of finish. Among the objects of unknown function we

Fig. 33-34. Polished mammoth-tooth plate, a „*chourounga*"

can classify the most specific object found on the site. The tooth plate of a grown-up mammoth (not the tusk!) was polished-smoothed into regular oval form, shiny and rounded. On its surface, traces of red mineral paint were also spotted. The object was identified as a *chourounga* by László Vértes. This strange-sounding name denotes a symbol of the faith of the Australian aboriginals. It is an oval or fish-form plate with mystical engravings. On the ceremonies of men, it symbolises the history of the tribe preserving the good will of the ancestors (men, living beings, plants or animals, natural phenomena) for the community.

We do not have to explain long that the hunters' community living in the former calcareous tuff basins could thank their lives, the preservation of the community and the continuation of life to the mammoth. To turn it to ordinary speech, probably they realised that mammoth as their main game is the basic condition of their survival and should be esteemed accordingly. We can conceive the mammoth-teeth plate as a symbol of this row of ideas.

It can be a far-fetched deduction to trace back an object of modern age and the embedded spiritual contents into the age of the Neanderthal men. Australian aboriginals, however, follow one of the most ancient way of life among the known peoples and their life-style and believes preserved Palaeolithic traditions. It is also certain that the Tata mammoth-tooth plate was not suitable for practical tasks and in its form, it resembles the chourounga. Thus the interpretation of László Vértes is not the most unlikely among the possible explanations.

Concerning the age of the site, we are troubled by the abundance of evidence. Samples taken from the Porhanyóbánya and several points of the site have been investigated in several leading research laboratories of the world from Canada to Moscow. The results are varied, ranging through almost all of the time span attributed to Neanderthal people. In a cynical way we could say that everybody could select their favourite dating, fitting best into their theories Fortunately the site was not destructed during the excavations as it is unfortunately typical for open-air sites. Thus new samples can be collected for more exact studies, completing the existing archaeological and scientific results. Thus the age of the site, harmonising with other sites of similar chronological position can be estimated around 100 thousand years.

# Prominent students of the Palaeolithic sites of the Által-ér valley

**István Gaál** *(Ősagárd, 1877. - Budapest, 1957.)*

Born as a son of a an Evangelical parson in a small village in Nógrád county. His interest in and appreciation for objects and phenomena of nature was apparent in his juvenile years and his course lead directly to the natural history and geography department of the Kolozsvár (today, Cluj-Napoca) University. He continued his studies in Budapest and graduated as a teacher of natural history in 1901. In the same year he received doctor's degree in the disciplines of geology and palaeontology.

He started his professional career as a highschool-teacher at Déva. On the initiatives of Antal Koch, his professor at Budapest, he got involved into the geological research of Transylvania and studied the origin of the Déva saline string, the natural gas deposits and the terrestrial Molluscan fauna. From 1911 onwards, he published several topical works on these subjects. In 1911-12, he took part in the mapping geological survey lead by Hugó Böck. As an appreciation of his scientific oeuvre, he was appointed private professor of the Kolozsvár University on the department lead by privat docent Gy. Szádeczky-Kardoss.

The list of his professors and consultants is most respectable. In the formative period of earth sciences he used to work together with classical authorities of the subject.

His promising scientific course was interrupted for a long while by World War I. After 19 months of military service in the front-line, he returned from the Italian battlefields by late autumn of 1918 in an injured state of health from which he did not really recovered till the end of his life. Between 1919 and 1924, he used to serve as the first professor of geology at the Szeged University. From here, he was invited to join the Palaeontology Department of the Hungarian National Museum in 1925. (In those days, the Museum of Natural History operated still in the frames of the HNM). He used to work for the Museum for the rest of his active working years, and retired to pension in 1934.

As an appreciation of his scientific activity, he received the title „*Candidate of Geological Sciences*" in 1953.

He continued to work even after his retirement. His incredibly broad field of interest is reflected by more than 500 publications from various fields of earth sciences,

widely extended in time, space and topic. His primary field of interest was palaeontology. He used to deal with the Pleistocene fauna of several caves inhabited by prehistoric people. He performed the partial excavation of the Szelim-cave and obtained imperishable results in the cognisance of the region.

**Tivadar Kormos** *(Győr, 1881. - Budapest, 1946.)*

Together with István Gaál, Kormos belonged to a generation of research workers hallmarked by László Vértes as the heyday of Hungarian Palaeolithic research. This period lasted from the beginning of the planned excavations to the World War II.

Kormos received his doctoral degree in 1909 at the Budapest University. Between 1908-1919, he was working in the Royal Hungarian Geological Institute. His main field of research was palaeontology, in the beginning, mainly that of molluscs (malacology), later the study of fossil mammals. After the Hungarian Soviet Republic (1919) he lost his job and worked as private clerk for some years.

From the 1930-ies he returned to geology and worked, first in coal mining, later in bauxite research till his death. His scientific interest was considerably broad. His first scientific publication, on birds, was published in the age of 22.

Being a cave-explorer, he joined archaeological research fairly early. His first and, even now, justly renown excavation was, however, performed on an open-air site. Simultaneously to the excavations started at the Szeleta-cave, he excavated a portion of the Middle Palaeolithic site Tata-Porhanyóbánya. His next major archaeological effort was devoted to the Pilisszántó rock-shelter, becoming another classical site of the Hungarian Palaeolithic. The excavations were only stopped for a while by the outbreak of World War I.

His scientific activity was not restricted to the study of the end of the Pleistocene period only. In the Villány Mts., he excavated a range of basic Early Pleistocene faunal assemblages, setting a firm basis for the biostratigraphical division of the Pleistocene. His broad field of interest, excavations and complex methods of scientific elaboration yielded several results appreciated even today and attained general credit on behalf of both Hungarian and international research.

**István Skoflek** *(Felsőgalla, 1934. - Tata, 1981.)*

László Vértes expressed probably the best and most amusing way, what can we, archaeologist, be specially thankful to István Skoflek, among other many things:

*„At that time, around 1957, we were struggling hard with Pál Kriván geologist to overcome „white noise". What about Tata? What do we know about it? How would it look like, after nearly fifty years in the light of the accumulated experience?*

*We jumped into a car to look.*

*It was just a late March day threatening us with a blizzard. The jeep was a friendly loan, as it was not very likely for the archaeologists and geologists of those days to own a car.*

*When we reached the site, the early spring sun just popped up. I had already been to the former Porbanyó-quarry, left off because the continuation of mining would have endangered the building of the secondary school. I could collect from the clefts of the rock some bones myself, which could stick to my tongue after licking them, a primitive but effective test on their fossil age. They were bones of an old type of bear and some fragments of old deer antler - we had them inventoried duly as finds contemporary to the Tata Moustérian finds of Kormos. I could not find, however, any Palaeolithic stone tools.*

*The jeep turned into the left-over quarry and our eyes were immediately attracted by a heap over yellow sand, shining at the bottom of the moss-covered grey cliffs. Beside the sand-heap there was a little girl standing in a school-cap, obviously fulfilling some mission.*

*- What are you doing here? - we asked her, bewildering.*

*- We are just... well.. collecting - she said in a great dismay, our teacher will surely tell, and shouted inside a cavity of a size of a badger-hole: Mister Teacher! Mister Teacher!*

*From the badger-hole, we heard noises of somebody moving about and in a few minutes a little man pressed himself out of the ground whom I would rather call a buster, but seemingly he was Mister Teacher. It was also apparent that he realised my beard as token of an archaeologist because as soon as he sprang out from the muddy hole, he stepped to me and handed me, in a dirty cap, a selection of most beautiful stone implements.*

*Later on the buster-like Mister Teacher became a special friend of mine and my best co-worker: István Skoflek, remembered the same scene that I myself, in a minute, jumped in the badger-hole with closed legs, hand over my head like a diver. Somehow, this fits my faint remembrances, too...*

*István Skoflek, teacher of the Tata Secondary School, and expert of fossil vegetation, collector of leaf-prints used to collect plant*

*fossils in the pits of the left-over quarry and in the meantime discovered a new, very rich continuation of the site investigated by Kormos about half a century before. He just meant to find me in the National Museum when sheer luck, an ever returning moment in my story, brought me there like unforeseen thunder. This is not just a simile, because in my first surprise, I ragged him duly for not telling me before, how did he dare... for his new discovery.*

*The outcome was that in the same year I had excavated the old-new site, collected some 2000 beautiful tools which I myself classified immediately as Mousterian and did not change it ever after just started to hesitate a bit when like an ambassador forced me to stand for his opinion.*

*By 1964, the Tata finds accumulated to a beautiful great monograph, in which István Skoflek elaborated the palaeobotanical chapter, I had personally written the archaeological part and some twenty more colleagues contributed and worked for it"* (Tata, eine mittelpaläolithische Travertinsiedlung in Ungarn. Archaeologia Hungarica, Vol. 43.. Akadémiai Kiadó, Budapest, 1964.)

Friendship and collaboration with István Skoflek continued at the site Vértesszőlős, too. The educator, scientist, museologist István Skoflek collected and elaborated the calcareous tuff flora of Vértesszőlős as well, same as other plant fossils from younger archaeological sites. For his activity as educator he received a State Award in 1975. His early death broke off an exuberantly unfolding scientific career.

**László Vértes** *(Budapest, 1914 - Budapest, 1968)*

Vértes used to work on two sites of the three mentioned in this booklet: continued the excavations of Tata, while the excavation of the site Vértesszőlős can be completely connected to his name.

He was born in Budapest, 1914, to a middle-class family. Completed his secondary school at Makó, and after maturity exam, enrolled the Medical University. He had to stop learning due to the modest means of the family. He earned his living by variable and exotic work (e.g., he used to work as acrobat in a circus). His interest gradually turned to exploration of caves.

In the months immediately preceding World War II., he used to work in the Solymár rock-shelter together with his master, Ottokár Kadić. This hobby developed into a profession after the bitter circuits of World War II.

After the creation of immediate material conditions of scientific work (i.e., clearing away the ruins) he was appointed leader of the Cave Supervising Authority, assigned

to the framework of the National Museum, later on between 1947-1951 he became the head of the Geological and Palaeontological Department of the Natural History Museum.

These years are hallmarked by the re-starting of the Istállóskő excavations, organisation of modern exhibitions, both in contents and realisation.

In 1951, the Palaeolithic collection of the Geological Institute was transferred to the Hungarian National Museum, and the management of the enlarged collection, multiplied in quantity as well as scientific value was trusted on László Vértes. He served as curator of the collection till his death in 1968.

His route to prehistoric archaeology was varied, rich in obstacles and by-passes. The difficulties set by official policy or poverty induced him to constant self-education. Though he did not boast about his informal education, he never denied that he got his scientific degrees - first, Candidate's degree, later on, in 1965 Doctoral degree of the Academy, by self-training. This fact was a valuable asset to science: he was never stopped by professional doctrines, and preserved his readiness to renew his knowledge till the end of his life. He established new ideas, new aspects in excavation methodology, scientific elaboration, presentation for public in exhibitions and popular scientific works.

His interest in the events of the Ice Age and palaeontological background rooted in speleology. By the end of the fifties, however, his activity reached full complexity, started to excavate open-air sites as well. In 1958-59, he continued the excavation of Tata-Porhanyóbánya started by Tivadar Kormos and the result of scientific elaboration of the site is a monograph awarded with special prize of the Hungarian Academy of Sciences.

Since 1962, when the geographer Márton Pécsi brought news about the Vértesszőlős Palaeolithic site, most of his time was consecrated to the Vértesszőlős Lower Palaeolithic site: organisation of the work, excavation, in modern terms, PR management (i.e., convincing authorities about moral and financial support), receiving research workers from Hungary and abroad, writing studies and making study trips to get more information on the so-far unparalleled material. He died following the first phase of the great work, by the end of the excavations, and the publication of the monograph dealing with the site and the finds remained a task for the successors and colleagues.

His scientific activity is preserved in several books, monographs, studies. Among them, his popular scientific books „*Chronicle of the Cave-Bear Men*" (Medveemberek krónikája), on the Istállóskő excavations and „*Pebble Path*" (Kavics ösvény), a chronicle of the Vértesszőlős excavations can be a memorable reading for those persons as well who are not at home in the labyrinth of technical literature of Palaeolithic archaeology.

# Conclusion

The Által-ér valley is an especially attractive corner of Hungary. Starting from early phase of the Palaeolithic period till our days the people of all archaeological and historical periods could find here favourable conditions for their living. We cannot speak of a physical continuity as the geological-anthropological-archaeological-historical changes of the past nearly half million years have essentially modified the natural and cultural image of the environment. It is, however, certain that people returned to this appealing and variable region, from the time of the Palaeolithic hunters till the age of modern industrial society.

The present is our responsibility. Let us pay heed to the ideas of the poet Mihály Vörösmarty:

„... *a múltat tiszteld a jelenben, s tartsd a jövőnek*!"

(„... appreciate the past in the present and preserve it for the future!")

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