50 YEARS OF PALEOLITHIC RESEARCH IN SLOVENIA

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As early as before the 1st World War, some attempts were made to find traces of Ice Age man in Slovenia, but without great success. The antlers of a reindeer, bearing incised cuts, which were found by chance at Vrhnika, were taken to Graz but are now lost. Also now lost is the human jawbone discovered at Jama nad Loko (Jama near Loka) in Istria, which was kept in Trieste.

The true beginning of Palaeolithic research in Slovenia is considered to be the discovery of the Potočka zijalka cave in 1928. Its excavation lasted eight years and was concluded in 1935. The results were extremely significant and immediately became widely publicised.

The search for new sites then began and palaeolithic centres were discovered at Špehovka near Zgornji Dolič, in the Mornova zijalka cave near Šoštanj and in the cave below Herkove peči (Herk's cliffs) above Radlje. The results provoked great interest among the public and finds of bones began to be reported. In three cases, i. e. the discovery of the remains of mammoths at Kostanjevica on the river Krka and at Nevlje near Kamnik and the discovery of the bones of a cave bear at Njivice near Radeče, the excavations which immediately followed also uncovered traces of man.

At that time there was no subdivision of the Pleistocene era and Penck's division into four glaciations and three intermediate periods was still in use. The finds had to be fitted into this framework. The Potočka zijalka cave displayed all the characteristics of the Swiss high Alpine sites which were dated to the last interglacial, except that its typical Upper Palaeolithic cultural remains did not fall within this frame. Especially at the beginning, when exclusively bone points were found and no stone tools, it was difficult to call this an Aurignacian culture, although it was obviously closely linked. At that time J. Bayer overcame the difficulty by creating a new cultural group — Olševian — including other, similar sites. According to his interpretation of the course of the Ice Age, this group falls nicely into his so-called "Aurignacian gap". With Bayer's death in 1931 his interpretation was immediately abandoned and the chronological position of Potočka zijalka cave was again a problem. However the Olševian concept had taken root and was recognised by workers in the field.

It was possible to include the finds from the upper occupation level at Špehovka and the material from Jama under Herkove peči in the same group as Potočka zijalka

because of many similarities with the site at Drachenhöhle near Mixnitz. The finds from other sites were more primitive: Mornova zijalka cave, Njivice, Kostanjevica and the lower part of the occupation level at Špehovka. At these sites, dating to an interglacial would be more logical, although it was clear that they were not typically Mousterian. K. Absolon postulated the theory that there were no earlier cultures in Central Europe, but rather some sort of pre-Aurignacian phase and this pre- or primitive Aurignacian had been an apt term for the finds in Slovenia.

By the Second World War, which interrupted all work, we had discovered only a few of the whole range of Palaeolithic cultures. Middle Palaeolithic was but modestly established, defined more by primitiveness than by the typological characteristics of the tools found. The beginning of the Upper Palaeolithic was well represented by the stone and especially bone finds from Potočka zijalka. The whole of the rest of the Upper Palaeolithic was only hinted at by the missing antlers with incisions from Vrhnika and a single blade from Nevlje and two small backed blades from Špehovka. The isolated find of two bone harpoons from Špehovka can be assigned with fair probability to the Mesolithic period.

In 1946 work began again but now on firmer foundations, as an institute for this purpose was founded that year at Ljubljana University which — although very small — ensured the continuity of the work. The Slovene Academy of Sciences and Arts also included research into the Early Stone Age in its programme.

Thus already in 1947 excavations were organised at Betalov spodmol overhang near Postojna, which continued until 1953 with extremely important results. Over a section 10 metres deep (the base of the cliff has not yet been reached) the site was greatly subdivided and contained a number of various cultural stages. Numerous remains of fauna and flora accompanied the deposits. All this, together with the study of the development of the Postojna valley, enabled a firm chronological table for the whole Karst region to be drawn up which in many features was valid for a wider area as well. It was possible to establish that the primary sandy flysch was deposited during the Mindel-Riss Interglacial and that in the thick rubble layer belonging to the Riss glaciation cultural remains appeared for the first time. These deepest sediment layers which were only excavated over a very small area and produced a very small number of finds, were classified as pre-Mousterian or Tayacian. In the following thick, pure clay stratum, which belonged to the Riss-Würm Interglacial, there were numerous Levallois-Mousterian finds. In a series of rubble and clay layers which continued upwards and belonged to the Würm glaciation, there followed one more Mousterian layer, two late Mousterian, a layer of late Aurignacian (in a wider sense) and one more with traces of the final phase of the Upper Palaeolithic. On top there was a postglacial, fine rubble layer containing some small, probably Mesolithic, artefacts. The whole was covered by a calc-sinter crust on which were a few modest Bronze Age remains.

During the excavations at Betalov spodmol, smaller investigations in the Postojna grotto (near the Elephant's head limestone formation) and in Otoška jama confirmed that both contained traces of Ice Age hunters. Both caves are tourist attractions and work done to this end so disturbed both entrances that further excavations were pointless. The remains found are so few that they do not permit any independent classification.

The discovery of Palaeolithic site at Parska golobina on the south side of the Postojna valley was significant as it confirmed the results from Betalov spodmol. The finds were not so good but the stratigraphy supports that of Betalov spodmol, although it did not show such a degree of subdivision.

During the extension of the stone quarry at Črni kal near Koper in 1955, a cave, blocked to the roof with sediment, was found. A swift rescue dig uncovered a varied stratification and fauna. Above the base layer of flysch clay, which, on the basis of results from Betalov spodmol was dated to the Great Interglacial, lay a series of later sediments, divided into clay and rubble layers. In the first Würm layer a single artefact was discovered which has so far been classified as a handpoint. It would probably be more correct to call it a scraper but this does not alter the opinion that it belongs to the advanced Mousterian.

At about the same time our second Alpine Aurignacian site was discovered, in the Mokriška jama (Mokrica cave) above Kamniška Bistrica at a height of 1500 metres. Excavations lasted several years and although we dug down to a depth exceeding 7 metres, we did not reach bedrock. The results confirm and amplify those from Potočka zijalka and the questions raised are the same. The deepest occupation levels probably still belonged to the first, Würm stadial, followed by a series of layers, several metres thick, from the following interstadial. The last period of glaciation is poorly represented in the sediment layers, which can be explained by the cave's being completely frozen. In layer 7, which already belonged to the second half or even the last third of the interstadial, four cultural levels were detected. The following one, layer 6, which bore witness to a severe deterioration in the climate and the approach of the ice sheet, contained remains left by man during his final visits to the cave.

Up to this point there was almost no evidence of the Upper Palaeolithic after the Aurignacian. However, in 1952 an exploratory excavation in Županov spodmol showed that a larger excavation might produce something new. A series of Gravettian sites was discovered, beginning with Jama v Lozi near Orehek and followed by Ovčja jama cave and Zakajeni spodmol near Prestranek, Županov spodmol near Sajevče, Ciganska jama near Kočevje, Poljšiška cerkev near Bled, Babja jama near Domžale and Matjaževe kamre (Matthew's chambers) near Rovte. Roška špilja at Škocjan and Lukenjska jama near Novo mesto also belong to this group, but as yet there have been no extensive excavations at these sites and this is still to be done. All the above sites are in caves, but there are also two sites in the open: the — unfortunately almost destroyed — site at Podrisovec near Postojna and the find from Meriševo in Solkan, included here with reservations as the culture has not satisfactorily been determined. The sites already mentioned produced a more or less flourishing stone industry of narrow blades with numerous examples of backed blades and a few bone artefacts Animal remains discovered belong to arctic fauna. The reindeer appeared for the first time in greater numbers in Slovenia at this period, while the cave bear existed only at the beginning and later had completely disappeared. We can date the remains to the second half of the Würm period, mostly to the time more or less around the peak of the glaciation.

Although in the last twenty years the discovery of Gravettian cultures has been in the forefront of activity, several other sites have also been discovered. The excavations at Jama v Lozi produced surprising results. Autochthonous shingle clay sediment layers lay on top of flysch clay washed down by water which according to our under-

standing belonged to the Great Interglacial. In the clay deposits one flint stone and two flakes were discovered. We have no means of identifying the culture but as they were obviously signs of human activity, this find represents one of the first traces of man in Slovenia. In the small cave at Risovec near Postojna a few artefact flakes were discovered among the flints. Their edges were sharp, which means that they had found their way into the flints only in the vicinity of the cave. The finds were too few for a cultural determination, but stratigraphically they belong to the beginning of the Riss glaciation, this is, to the time when man first came to Betalov spodmol.

Many discoveries fall into the Middle Palaeolithic period or broad Mousterian. Under the Gravettian deposit in Županov spodmol there was a modest layer of Mousterian. Neanderthal man also visited Matjaževe kamre, and left modest traces of his presence. During the ploughing of a field at Blatni vrh in Kozjansko a fine handpoint was found. In the Marovška zijalka cave in Dolenjsko we have a Mousterian site which is, however, difficult to determine chronologically because of its poor stratigraphy. In the Postojna grotto, where in 1951 we had already uncovered a site near the Elephant's Head formation, massive works were later carried out for the building of a new railway, during which the former Pleistocene entrance into the cave was discovered, which previously had not been visible as it was filled to the roof with sediment and over-grown. A proper excavation was not possible among the building works, but it was possible to gather together enough material to be able to assign the site at least in a broad sense to the Mousterian period. And finally during the primary excavation in the Vilharjeva jama cave near Postojna a fine Mousterian scraper and two rhinoceros teeth were discovered.

We might have had to pass over the Aurignacian period, were it not for the chance surface find of a blade from Ruperč vrh in Lower Carniola, although it was not a parallel to the Alpine Aurignacian but a final stage of transition into Gravettian.

Several years of collecting flint flakes on the fallow ground at Dedkov trebež near Prestranek have already produced so much material that a Mesolithic cultural stage has been proved. Excavations beneath the small overhang called Pod Črmukljo, near Ilirska Bistrica, uncovered a dense Mesolithic settlement, though unfortunately again without stratification.

In the last few years a large number of sondages have been dug, but the majority have been without positive results. We succeeded in the cave called Koprivška luknja above the Paka valley, where at a depth of over 3 metres we discovered small pieces of charcoal and burnt fragments of bones and also a small flint flake, from the transition into the Holocene period. In the corner of a sondage made in the cave called Divje babe in the Idrijca walley, which had produced many bone remains of cave bears, we came upon a considerable amount of charcoal at a depth of about 2 metres.

From this short survey of Slovene sites it is obvious that we have no finds from the whole of the early Pleistocene. Up to now we have found no trace at all of the handaxe or pebble tool cultures which could be expected from this period. To conclude that at that time Slovenia was not yet inhabited would probably be a mistake. A more probable reason is that in Slovenia there are very few early sediment layers and therefore there is *a priori* very little hope that we will ever find signs of this early culture. In the Karst district there are widespread flysch sand and clay deposits which we can date to the Great Interglacial, but these are water sediments and finds can

only be made by chance and in isolation (Jama v Lozi). We have nevertheless indirect proof of older settlement. Two tools found at Jama v Lozi were made from the same piece of flint and experiments have shown that they belong together. Subsequent fashioning of each piece separately into a tool blurred the original shape to some extent, but in spite of that it can be clearly seen that, if the two pieces are fitted together, we have a fairly large Levallois blade. The inhabitants of Jama v Lozi used the objects which they found on the site of earlier habitation, as their raw material. The Mousterian deposits from Betalov spodmol contained examples on which traces of earlier working were clearly visible. So here as well the hunters of that time found the remains of an earlier culture.

Man came to Betalov spodmol for the first time at the beginning of the Riss glaciation. One rather weak conjecture ascribes their tools to the Tayacian culture. A more sound theory is that they were pre-Mousterian, as once defined by H. Obermaier. This would be a primitive phase from which Mousterian developed, with the passage of time. An extensive excavation should really be undertaken in Betalov spodmol in order to obtain a large number of artefacts, as a good knowledge of such an early culture would be very important in a wider context as well. Unfortunately in our present situation this task cannot be realised.

After the Levallois-Mousterian, which is well developed and sufficiently well represented to be clearly defined, continuity abruptly breaks off. The culture which followed is so different that it can by no means be a continuation of the underlying one. The basic material was completely different, quartzite being almost exclusively used, and typologically the culture was also quite unlike the previous one. The differences were so great than we can justifiably envisage a new population, not acquainted with the area into which they moved but who retained their own traditions. What happened to this population is not known. The following deposit layer again contains tools made of local material, especially horn, which gives the impression that the original population had returned. As this was already at the end of the Mousterian, however, it would be too much of a risk to postulate a genetic link with the preceding cultures.

Betalov spodmol is Slovenia's only site where there were several very productive layers of Mousterian. The majority of other sites which also revealed traces of Mousterian had only one layer each. It seems logical that these finds would be parallel with Betalov spodmol and could be classified on this basis, but up to now this has not been successful; either the finds were too poor or their typological links too weak.

Mousterian sites are well distributed through Slovenia, which cannot be said for other cultural stages. Considering the relatively large number of sites and that among them some finds are reliably dated, constant attention should be paid to a study of their mutual links of time and culture. Without regard to the fact that there are still a number of open questions, it is certainly true that the development of Mousterian in Slovenia falls into a common European framework.

The problems which arose with the discovery of Potočka zijalka have changed somewhat with time. It appears that even individual glaciations were broken up by warm intervals. Three ice stadials and two interstadials have been established for the Würm glaciation and thus Potočka zijalka has found its rightful place, as it could never have been crammed into one interglacial. Its insertion into the first warm period of the Würm glaciation (W I—W II) quickly found approval. These very finds

from Potočka zijalka prove that the climate must have been so mild that the warm interval was almost as warm as an interglacial. It was more difficult with Swiss sites, but in the course of time the opinion prevailed that these belonged to the same interval, a theory that was aided by the discovery of Mokriška jama. This discovery had still further consequences. Besides precise dating, achieved by granulation analysis, new data led to a recognition that the arguments on the basis of which the Olševian period was postulated had weakened with time and were no longer valid. All sites in this group should be assigned to the Central European Aurignacian, which alters the latter's character to some extent and gives it a more definite position in time, precisely on the basis of the findings from our Alpine sites. Because Aurignacian first appeared in Western Europe with Arctic fauna, i. e. at a glaciation peak, this also points to the direction of development. Coming from the east, it spread over Central Europe, still during a period of warm climate; it developed typologically and with the onset of a new cold era reached western Europe and at the same time took on its final form. Because of this situation and because we believe that Olševian in its old sense did not exist, we have suggested that the term Olševian should now be applied to all Central European Aurignacian.

Beneath the occupational levels in Potočka zijalka lay a roof fall. Already during excavations an attempt was made to establish how thick this layer was and what was beneath it. This attempt was called off at a depth of 10 metres. The rocks continued into the depths and unfortunately it was not possible to establish if there were more occupation levels below the roof fall and if so, which cultures they represented. The situation was similar in Mokriška jama. Below layers 6 and 7, which were known as occupation levels, a small depth sounding revealed a whole series of layers, including a roof fall, although considerably smaller than the one in Potočka zijalka. Layer 9 even showed some signs that it was an occupational level (a small piece of quartzite, a small piece of non-local limestone, and a dark strip in the layer) and more extensive excavations might produce several new aspects. Palaeolithic experts have always regarded the cultural remains from the Swiss Alpine sites as primitive, as they have always been judged on the basis of classical French models. From our (Central European) viewpoint the situation is somewhat different. From a close examination of the material it is possible to distinguish not only early marks but more progressive elements e. g. a considerable amount of steep retouch. Theoretically, from the lowest deposits of Slovene sites we could expect to find this phase of cultural development, and this would represent a real advance in the complex question of when the Upper Palaeolithic appeared. Unfortunately both actions, especially in Potočka zijalka, are not realisable under present conditions and will have to be done by a future generation. It is at least fortunate that the sediment deposits which lie deep down are not threatened.

True Aurignacian is only found in the Alps and sub-Alpine regions. Elsewhere it did not exist, even in the Slovene Littoral, where there are a large number of sites. It was not even to be found in the rich variation of deposits in Betalov spodmol. We can establish this but cannot explain it.

The basic scheme of Palaeolithic cultures arose in France. There the initial stages of the Upper Palaeolithic were followed by the Solutrean and Magdalenian. In Slovenia, as in its wider surroundings, these two cultures were not present. Instead of them, Aurignacian developed into the so-called Gravettian, which then lasted to the end of the Palaeolithic era. The details of this transition are not known, but it is in

good evidence in Slovenia. At Špehovka two small backed blades were found, above Aurignacian finds. The finely worked blade from Ruperč vrh probably also belongs here. Its appearance and retouch are still Aurignacian but the material is light grey flint which did not appear in Slovenia until the Gravettian period and was not present in older cultures. Level 6 in the Mokriška jama cave, which dates to the beginning of a stadial, produced a small flake with Gravettian retouch.

We can assume that Gravettian was already widespread in Slovenia soon after the advent of a cold climate. The number of sites is relatively large and some, at least by our standards, are relatively rich in finds. Several sites have two occupation layers while Županov spodmol has three.

At first it seemed that Gravettian was limited to the Slovene Litteral but finds in Ciganska jama cave and Lukenjska jama cave in Lower Carniola and in Poljšiška cerkev and Babja jama cave in Upper Carniola soon refuted this opinion. At the present time no Gravettian sites have been found further east, but this is true for other cultures as well. This is partly because we have searched there less intensively but also partly because Eastern Slovenia has no larger Karst regions and the incidence of caves is infrequent, while surface finds can be made only by chance.

In general we observe that sediment layers from the second half of the Würm glaciation were poorly developed. Only in those caves containing Gravettian cultural remains could we determine thick layers from that period. Their physical similarity was also a surprise. In all cases they consisted of a uniformly small gravel, mixed with clay to a greater, or, usually, lesser extent. Even some uniformity of colour was to be seen, the clay part being yellowish or greyish.

North and east of Slovenia there is a great gap in Gravettian, but northern Italy, to the west of us, has a considerable amount which has been well investigated. All studies up to the present indicate that our sites also form a part of this large Gravettian province which naturally developed independently, as, during the Gravettian period, the Alps were almost or completely impassable.

A more detailed dating of individual sites and their mutual chronology is as yet unclear, but an attempt has been made at a more detailed analysis. To the oldest group which followed the Aurignacian belong some of those sites which still showed signs of cave bears. It is konwn that the cave bear died out before the last glaciation peak and thus a chronological limit for this group can be fixed. A number of Arctic-Alpine fauna, in which the reindeer predominated, belonged to a second group from around the last peak of glaciation. A third group belonged to the stage when the ice finally withdrew. Here the reindeer still appeared but was gradually supplanted by warmer species. The Alpine marmot survived through the entire period up to the Holocene. This chronological classification is unfortunately not reflected in the development of cultures. The first stage is poorly represented by finds and is typologically undefined. No development can be seen between the second and third stages. Only the microlitisation to some extent heralds the approach to the Mesolithic.

We have found only a few Mesolithic sites and of these only two contained more varied finds. These were of a Tardenoisian character but further classification is not possible as the surrounding region also contained very little material. A particular weakness lies in the fact that not a single site has produced data which would permit a chronological classification.

Slovene Palaeolithic sites, as far as we know up till now, were not permanent habitations. Even Betalov spodmol, our most productive site, was probably merely a spot where people stopped for only a short while, although many times through the long ages of the Middle and Upper Palaeolithic. All our sites have produced only objects which were lost or left behind during isolated visits by man, whose traces were quickly covered by sediment; nowhere are there any intensive occupation layers.

During the first few years after the war we developed our methods of research to, such an extent that our excavations were certainly among the best in Europe. We also had a palaeontologist who classified animal remains and a pollen analyst for vegetation and anthracitic research. In the rest of the world things developed very rapidly and interdisciplinary research was set up so that nowadays it is usual that as many as 20 or more experts from various fields collaborate in every larger excavation. In Slovenia we did not make any progress in this respect, on the contrary, we lost our only palaeontologist. As long as we only deal with poorer sites, this lack is not visible on the surface. However, if we were to find a real settlement, the only sensible thing would be not to start an excavation at all.

Palaeolithic cultures belong to archaeology, but because of the period at which they existed, they also belong to the earth's history, field excavations and research into sites are a matter for the natural sciences. As long as we can trace cultures, it is possible simultaneously to follow up physical data and details. If there is no evidence of human culture, or no longer any in the deeper layers, the excavation has to be stopped, although it is probable that useful and interesting stratigraphical and other data could still be obtained. This is because there is no organised research into the Pleistocene in Slovenia, i. e. there is nobody who could continue the work. Prominent examples are Šikančeva jama, Ciganska jama, Poljšiška cerkev and to a greater or lesser extent at every excavation.

Today it is impossible even approximately to sketch out the continuity of events in the Palaeolithic era in Slovenia. If we leave out the Lower Palaeolithic which — at least up till now — we have no evidence of, then we have about 150,000 years to deal with. The finds we have enumerated and briefly commented on therefore illustrate a very long period of time and we could say that on average, only every 3000 years do a few minor data on the life of man appear, which is far too little to risk postulating any kind of picture of man's development. For a long time yet we will be forced to continue patiently collecting data.

It should also be mentioned that it is impossible to plan results in Palaeolithic research. Even when we succeed in finding a spot suitable for excavating, it is impossible even to anticipate what will develop. Yet it is only with new sites that we will — although unplanned — acquire new information which will supplement and illuminate our picture of the development of Ice Age man in Slovenia. Our basic task, therefore, is and will be for a considerable time, to continue the search for new sites.