

NEWS FROM ATAPUERCA IN ENGLISH

A selection of highlights from the previous issue



RESULTS OF THE 27TH EXCAVATION SEASON 2004

More Homo antecessor remains discovered in Gran Dolina

> Two Homo antecessor molars, two phalanges and a parietal found in the Aurora Stratum 10 years after first discoveries

> Level 6 at the Gran Dolina site has yielded 800,000 year-old human remains once again. Several bone fragments from Homo antecessor, the first hominid to occupy Europe found in association with stone tools and large herbivore bones.

Together with those found in the same layer in the 2003 season, they will provide a better understanding of this species in aspects such as its physical appearance, its family relations with its African forebears, its degree of proximity to the hominids in Dmanisi (Georgia) and the rest of Asia, and its ability to hunt. An analysis of the bone surfaces will help decide whether the hominids found this season were also part of the documented cannibal activities of this human ancestor.

In June work continued on the levels covering the rich Aurora Stratum, with several documented occupation stages containing numerous carnivore coprolites and remains of primitive horses and deer.

In mid-July, Aida Alarcos, Jaime Guiu and Jaime Vilalta were working on Level 6 when they noticed an adult phalange and an infant molar. These items were soon followed by more bones and teeth - an immature hominid parietal, another adult phalanx and a milk tooth, several of which might belong to the six individuals defined in our 1994 work.

However, the two molars confirmed the presence of a seventh individual in the Aurora Stratum at Level 6 in Gran Dolina, a child, probably 5 years old, represented by two lower milk teeth: the first definitive molar that had broken through and a milk molar (called dm1 by dentists and third deciduous by palaeontologists). Today, the definitive molars appear in children at the age of six. Assuming a slightly faster rate of maturity in these hominids, this child probably died at an earlier age. The wear on the deciduous tooth matches this age, permitting the logical assumption that it is from the same individual and not another child of the same age. With these new discoveries, there are now five identified immature hominids, implying an unusual infant mortality rate that seems to correspond to a violent phenomenon that is anomalous in any primate. Several flint and quartzite tools as well as several deer remains were also identified in the Aurora Stratum, from which we can deduce that life and death collided 800,000 years ago in Dolina. Whether they were the same individuals who inhabited the cave is yet to be decided.

Hominid remains were also unearthed during work in the Bones Pit. In this case they were Homo heidelbergensis, a descendent of the Gran Dolina hominids, from roughly 400,000 BP. Although work this season focused on geological and stratigraphic aspects, as well as opening a new excavation grid, several molars, a fo-

rearm bone, a radius and several skull fragments were found including a glabellum, the browridge area between the eyes, which is very important in anthropological research due to the variations found between periods and geographical regions. One feature that distances European hominids from their Asian counterparts is precisely their discontinuous superciliary arches, while in Asian populations, the edges of the sockets are continuous.

THE SITES, ONE BY ONE

Bear-claw cave > Our scientists dug a Lower Palaeolithic level where considerable carnivore activity and several Moe 2 (Acheulian) stone tools have been documented.

Elephant pit > While work on the upper levels had to clear the section after a number of rockfalls last winter, the lower levels continued to yield evidence of human presence in these hills 1.4 million years ago in form of cut marks on some of the animal bones. Two lynx jaws, a unique find in the European fossil record, complete the list of the most outstanding finds at this site which year after year is responding well to the increasing amount of effort being invested in it.

The Porch > At last we were able to empty all the infilling material from the old excavations, probably dating from the 19th and 20th centuries in the form of a pit that goes down more than 8 metres, where a large amount of decontextualised prehistoric and historic materials have been found. A small core sample was also dug beside one of the profiles to permit the documentation of the recent prehistoric cave sequence.

The Lookout

One of the most pleasant surprises of the season was, after 5 years of digging, finally arriving at the Pleistocene sedimentation levels in this cave. Our satisfaction was not complete, however, because the level only appeared two days before the end of the season, and was found beneath a large volume of fallen blocks that are going to hinder work next year as well. In the upper levels, the Neolithic sequence is unquestionably one of the best on the Iberian Peninsula, given that it ranges from the first neolithization points on the northern tableland until the cave was abandoned towards the end of the Bronze Age.

The Subsidence > News this season was the excavation of an outdoor settlement, El Hundidero or the Subsidence. Although it covers a large area, works began with a 6m² sample where a lot of stone material had been detected on the ground. Digging down almost 2 metres yielded over 300 pieces of stone industry from two technological periods; Acheulian and Mousterian. These discoveries will make it easier for future comparisons with material found during work inside the caves and an understanding of the hominid's activities outside.



EDITORIAL

Balance of the season

>ALFREDO PÉREZ GONZÁLEZ

Geology Professor. Complutense University, Madrid. ARG member

Once again, the 2004 discoveries at the archaeological and palaeontological sites in the Atapuerca Hills and its environs proved by no means disappointing for the 130+ members of the research team that dug and prospected the numerous accumulation points, yielding fauna, hominids and stone industry in the course of June and July this year.

The complex task of coordinating the activities at Atapuerca requires a precision almost matching the standards of a satellite launch, given that all the work is concentrated into a very short period of time, from bringing out the objects and labelling them to their identification and archival. On top of this is all the logistical organisation of accommodation, transport, material and many other requirements to ensure that the digging machinery can keep working. Readers must remember that the sites in the Railway Cutting that being worked on at the same time include the Elephant Pit, the Bear Claw Cavity in the Ga-



dually on the grids at the actual sites.

> The 2004 season saw advances in our understanding of the contents and importance of the sediment infills. In both the Porch and the Lookout we reached Pleistocene sediments, with important Holocene sequences in the roofs that will allow radiometric techniques to be used to date the Neolithic arrival of the first farmers and graziers to Central Iberia.

> The Elephant Pit has a beautiful but complex allochthonous infill from the lower and middle Pleistocene, which has almost be-

winning information from unit Gill, and the Gallery was sampled to reconstruct the history of the full Middle Pleistocene vegetation - the time span represented by these deposits.

> The Bones Pit in the Main Cave yielded human fossils once again, although this summer work focused mainly on stratigraphic studies which were extended to the adjacent Cyclops cave.

> This brief overview of the 2004 season must also include a mention of two milestones on the horizon for our research and preservation work at the Atapuerca sites: their forthcoming declaration as a Cultural Zone and the start of work on the Human Evolution Museum and Research Centre.

> In a couple of years, Atapuerca will celebrate 30 years of full-time research. Over this period, front-line scientists and research teams have been trained as part of the multidisciplinary analysis of the origins of Man and the Quaternary period. Now it is time for all the effort spent since 1976 to bear fruit in new palpable aptitudes and actions with the backing of the national and regional Governments. We all hope for and indeed expect this outcome.

MARKUS BASTIR READS THESIS ON HUMAN AND ATAPUERCA HOMINID SKULL

Markus Bastir's thesis, "Analysis of geometric morphometry of the morphological variation and integration in the human skull and its implications for Atapuerca-SH hominids and the Neanderthal evolution. Structural and systemic factors of the morphology of the craneo-facial system in hominids", supervised by Antonio Rosas, was defended on 26 May 2004 at the Autónoma University, Madrid, before an international tribunal of leading specialists in paleo-anthropological morphology.

The thesis analyses the influence of sexual dimorphism, postnatal growth and basicranial architecture on skull morphology using geometric morphometry based on 2D and 3D coordinates.

Within a causal-analytical and hypothetical-deductive framework, reference models were constructed in modern human populations and African simians. These models were then applied to the interpretation of bones

from Atapuerca, the Bones Pit and Neanderthals.

The results show that craneofacial variation is complex: while some aspects can be linked to variation in body size, others are related to encephalization and the architecture of the base of the skull, which is formed early in our babies. From this we can deduce that not all the factors have the same evolutionary significance.

HOMO HEIDELBERGENSIS COULD HEAR LIKE US

Ignacio Martínez and other Atapuerca Research Group (ARG) members have just published their study of the hearing ability of 350,000 BP pre-Neanderthals. They analysed the middle ear structure of these bones and reached the conclusion that Homo

heidelbergensis had a similar hearing ability to modern humans.

This hominid and Homo sapiens share the same sound transmission model, which is marked by the shape and size of the small bones in the ear. According to these ARG members, the adaptation towards this human model took place before the Homo sapiens and Neanderthal evolutionary branches separated approximately half a million years ago. Previous studies had found that chimpanzees do not hear like us, and this hearing difference is essential to distinguish phenomes from each other.

Meanwhile, a scientist at Madrid's Complutense University, Patricia Domínguez, has successfully reconstructed the inner ear of an avian dinosaur from the Upper Jurassic, the Archaeopteryx. His work has revealed that this feathered dinosaur, "had a great sense of direction and could perform delicate flight manoeuvres".

ARG AT WORK IN ABRIC ROMANÍ, MALPARTIDA, PINILLA DEL VALLE AND DMANISI

>ABRIC ROMANÍ (BARCELONA). Since 1989, the ARG has been working on the Middle Palaeolithic excavations at Abric Romani (Capellades-Barcelona) headed by Eudald Carbonell. This site's chronology runs from 55,000 to 35,000 BP, and contains a variety of technology from fire and stone to wood in what must have been a complex Neanderthal community.

>MALPARTIDA (CÁCERES). Since 1999 Carbonell, Canals and Saucedo have been co-directing the First Extremadura Settlers project, which aims to discover information about the Palaeolithic period in the region, release publications, hold exhibitions and train young Extremadura scientists. In the course of the project, the team has dug at several sites around Malpartida de Cáceres and discovered several important archaeological levels from 250,000 BP down to the most recent prehistory.

>PINILLA DEL VALLE (MADRID) is the third major archaeological project with ARG involvement. This project is headed by Baquedano, Bermúdez de Castro and Pérez González.

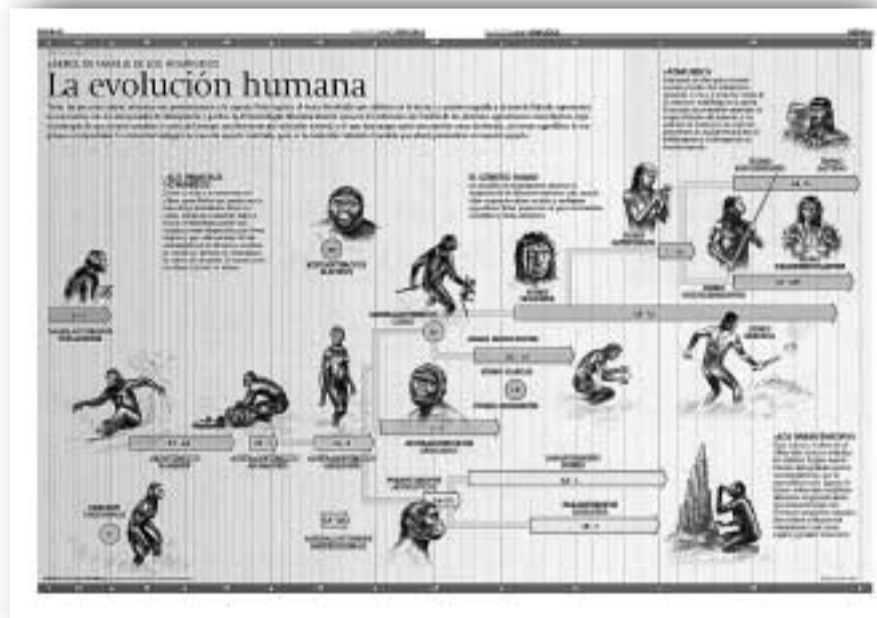
The discoveries in the most recent seasons indicate the presence of Neanderthal individuals as well as stone industry and abundant animal fauna remains. Using these elements, the team expects to analyse 120,000-140,000 BP hominid subsistence patterns, their technological activities and their habits.

>DMANISI (GEORGIA). A scientific delegation of members of the Atapuerca, Orce and Pinilla del Valle teams spent some time digging alongside the director of the National Museum of Georgia, David Lordkipanidze, at the Dmanisi site where new human bones are being unearthed year after year.

This season they found a metatarsus (foot bone), a shoulder blade, a collar bone, a femur and a tooth, all from hominids who were already outside Africa 1.8 million BP in what was probably the first Eurasian colonization.

BURGOS UNIVERSITY HOSTS SUMMER SCHOOL MEETING OF SENIOR ARG SCIENTISTS

Under Directors Juan Carlos Díez and José Miguel Carretero, both Senior Lecturers at the UBU in Prehistory and Palaeontology, the course brought together some of the leading research figures from the Atapuerca research group to debate modern society and the world on the basis of an historical and evolutionary vision of our species and our relationships with the environment.



lery and Dolina. In the Main Cave, there are two prongs to our activity, one right at the entrance to The Porch and another deep inside, in what is now a classic site - the Bones Pit.

> On the northern flank of the Atapuerca Mesozoic anticline is another excavation, the Lookout, and this year we also began to dig at an outdoor site dubbed The Subsidence which contains a lot of stone items on an old terrace of the Arlanzón River.

> The washing zone is set up on the banks of the Arlanzón River near Ibeas de Juarros. Here, the sediment taken from the excavations is sieved through mesh. It is hard but necessary work for the recovery of millimetric-sized stone and bone fragments which are impossible to pick out indi-

vidually defined this season, leaving us free next season to tackle the new challenge of digging the layers beneath the surface. These still invisible lower levels no doubt contain the oldest history of the infills in the Cutting. We will begin our magnetostratigraphic analysis here and on the terraces of the Arlanzón River as well.

> In Dolina, Unit TD10 has yielded thousands of fauna and industry records while in TD6, we found two molars, two phalanges and a fragment of a Homo antecessor parietal. In this unit, dating from before 780,000 BP, we have begun a detailed stratigraphic analysis to define its genesis and the palaeoenvironment when it was laid down.

> In the Bear Claw Cavity, progress continued to be made on