

>NEWS FROM ATAPUERCA IN ENGLISH



> **Atapuerca 06 season concludes with important discoveries: hominids and extremely old archaeological remains**

> **New Homo antecessor fossils confirm cannibalism as a common practice**
Results of the ATA06 season

> **Gran Dolina:** Homo antecessor remains were discovered in TD6. Outstanding items included teeth from several individuals of different ages, a child's humerus, a youth's collarbone and two quite complete jawbones, one of which was from an adult. Several of these items have surface marks produced by cannibalism, which seems to confirm the idea of violence amongst groups and the habitual practice of anthropophagy in this species. Flint and quartzite tools appeared in association with these fossils. In TD10 we worked on the level beneath the Middle Pleistocene campsite, which yielded evidence of brief visits by human groups.

Herbivore, horse and deer bones are predominant.

> **Bones Pit (Sima de los Huesos):** Almost 200 human remains and numerous bones from bears and other carnivores. The discovery of an almost complete human skull, 14 years after the previous specimen unearthed at this site. Recovery of bones in anatomical connection from several Homo heidelbergensis, the most outstanding items of which shaped a considerable part of a hand.

> **The Porch (Portalón):** Upgrading works and reinforcement of the contemporary pit. Several levels at the base of the Upper Pleistocene level, some containing stone remains, may indicate the presence of Upper Palaeolithic hunter-gatherers. Pollen samples were collected.

> **Lookout (Mirador):** The large-scale collapse of blocks from the roof of this cavity during the last glacial peak has hindered excavation work. Because the rock was heavily fractured, expansive cement was not needed. Almost five metres of rock were traversed in the hope of reaching the lower levels, but for the moment there is still more rock ahead of us and our goal will remain elusive until the next season.

> **Elephant Pit (Sima del Elefante):** Digging began below the current level of the Railway Cutting on the oldest levels in the whole Atapuerca complex. The most outstanding discoveries this season were new tool remains dating back more than a million years and several teeth from a macaque, a tailless monkey, indicate the existence of a forest environment in Atapuerca.

> **Hotel California:** Excavation of two levels at an open air site beside the Pico River. The detected traces of tools were in a stone assemblage from the end of the Lower Palaeolithic and early Middle Palaeolithic. The most important discoveries were a biface and several large cores.

> **Bear Claw Cavity (Covacha de los Zarpazos):** Minor human presence in this cave during the Middle Pleistocene. Tools, root marks and carnivore and herbivore bones were extracted.

Editorial:**When our belt came undone**

> Josep M. Parés Professor, University of Michigan, USA. ARG Member

James Van Allen, a prestigious pioneer US space scientist, died recently at the age of 91 in his home state of Iowa. Van Allen, Professor at the University of Iowa for over 30 years and member of the renowned National Academy of Science (USA), discovered the doughnut-shaped regions with high radiation surrounding the Earth in 1958, at the height of the tense Cold War, intensified by the recent launch of the first Russian satellite Sputnik. The explanation of an unknown phenomenon is sometimes so simple

A selection of highlights from the previous issue

that one is astonished it had not been predicted before. Van Allen's discovery was one such case.

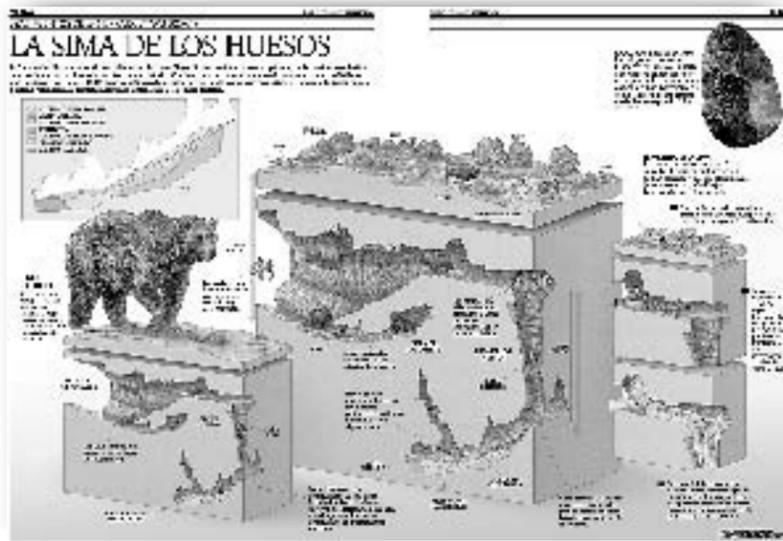
> In honour of the discoverer, these regions or clouds of ions and electrons that surround the Earth are known as the Van Allen belt. The origin of these rings or belts is in the Earth's magnetic field- Magnus magnet ipse est globus terrestris, or "the Earth is a giant magnet", as W. Gilbert put it in 1600. Actually, we know that the magnetic field are due to the convection currents in the outer metal core of the Earth.

> It is precisely the Van Allen Belts where the cosmic radiation and solar storms are trapped by the effect of the Earth's magnetic field. So, thanks to the presence of the magnetic field that acts as a trap, the Earth's surface and with it, all living organisms, are protected from the cosmic rays. Note that as living beings, we are at the mercy of two forces of the Earth-gravitational and magnetic-. However, unlike gravity, which we experience constantly (the reader is no doubt sitting while reading these lines), the magnetic field is intangible, to humans at least.

> Recent observations suggest that the magnetic shield that protects the Earth is weakening, leaving the planet increasingly vulnerable to the inclement "space weather". In fact, since the illustrious C.F. Gauss measured the force of the Earth's magnetic field in 1837, its strength has weakened 10%.

> Some scientists have even ventured to suggest that this apparent collapse of the magnetic field is an omen of a change in the Earth's magnetic poles-an exchange of the north

opposite direction. The question is how to know whether we are in fact witnessing part of the long process that leads to a change in polarity. If this happens, the weakened Van Allen belt will allow high doses of cosmic radiation to bombard the planet. Although it will probably not be lethal -we can reasonably predict that the remaining field will be enough to provide the necessary protection- satellites and high-flying planes will receive more radiation. Other possible consequences are due



to the fact that many aspects of nature are based on the regularity of the magnetic field: when loggerhead turtles embark on their journey across thousands of miles of ocean, they use the invisible ray of the Earth's magnetic field to guide them and navigate. Other species like salmon, wasps, carrier pigeons, frogs and crustaceans do the same.

> There is no cause for alarm, however: even if the change were to happen immediately, it might take more than 3,000 years to complete

Burgos Archaeological Survey, suggested by his thesis supervisor, Leslie G. Freeman (University of Chicago). The results of his work were published in the 1979 monograph in the Archaeological Research Papers, collection 19.

- How did you become interested in archaeology?

- I have been fascinated by prehistory and palaeontology since I was a child. Although I started in Fine Arts, I changed to Anthropology in

dictatorship, the country was under martial law, yet the people were always extremely friendly and positive.

In the course of our work we were helped by José Luis Uribarri, Basilio Osaba, Director of the Burgos Museum, and Padres (back then) Juan María Apellániz and Jesús Altuna, Padre Carlos Conde Dayz, Chancellor of Mercy College (who lent us Padre Ibero's collections) and Carolina Fuentes, who analysed the fauna from Cueva Mayor.

- What was your first impression on your arrival in the Atapuerca Hills?

- At the start of the 1970's, only The Cutting and Cueva Mayor were known. In the Cutting we cleared one of the cross-sections, and it became obvious that it contained extremely old bones. In Cueva Mayor we did a bigger dig and we collected surface material south-east of the cave entrance.

- How did you organize your work in Atapuerca?

- First we did a systematic collection of the material around Cueva Mayor that was covered by a lot of ceramic fragments, stone remains, etc., with the help of three young Danes on holiday in Spain. Then we did an exploratory dig in the same cave.

- How long did you stay in Burgos?

- The survey lasted two months, with two weeks around Cueva Mayor. The 'permanent' team consisted of five people, expanded with the three Danish girls while we were in Cueva Mayor.

- Your colleague Lawrence Guy Straus wrote, "During the final years of the dictatorship, Cueva Mayor in Atapuerca was the favourite meeting place for boys and girls, shelte-

1960's and 1970's was obsessed with the application of statistical methods. That's why we designed sampling methods with statistical validity in the proximities of Cueva Mayor.

- It's 34 years since you arrived in these Hills. What do you think of all the research work that has been done in the meantime?

- Amongst all of the important sites discovered in the Hills, the Bones Pit stands out for the amount of human remains that it has yielded (80% of all the known human remains from the Middle Pleistocene), their state of preservation and the fact that it is a sample of a biological population, which is extremely rare in human palaeontology. Best of all, the excavation work in the Pit is still at an early stage, so we can expect it to yield many important discoveries.

- Have you kept in touch with any of the members of the Atapuerca Research Group?

- I visited Atapuerca in summer 1996 with my colleague Paul Mellars (Cambridge). That was when I met Eudald Carbonell for the first time (although I had corresponded with him before), Juan Luis Arsuaga (who visited us in Arizona the following year) and José María Bermúdez de Castro. I met the archaeologist Marina Mosquera when we were in Cambridge in 1996 (both of us are fellows of the same college, Clare Hall).

In 1997, I wrote a letter of recommendation in support of the appointment of the Atapuerca team for the Prince of Asturias Award.

- You have travelled the world, from site to site, asking many questions about the behaviour of the human being. Have you found many answers?

- I think so. Since the end of the 1980's, I have been heavily involved in the debate about the origins of modern man. I am now convinced that the Neanderthals are part of our genetic heritage, and that their behaviour only differed from ours in a few subtle (and archaeologically hard to distinguish) aspects. On the other hand, I think that the existing primates (particularly African monkeys) offer us a more appropriate model for the behaviour of extinct hominids than Homo sapiens.

- We are constantly receiving exciting news of new discoveries that affect human evolution. Which evolutionary "enigma" or "mystery" would you like to unravel?

- I'd like to decipher the origins of our species. The case of the Flores hominids is fascinating. Although it has been challenged by several people, I believe that the researchers (Brown, Morwood, etc.) are right in their interpretation of the bones: they are remnants of a H. erectus population that colonized the island 800,000 years ago, and that they shrank along with the stegodonts and other animals that lived there as a result of restrictions on their habitat. In 1988 I worked in Cyprus, where there is also extremely shrunken fauna (rhinos and elephants).

- Over the years there have been many advances in the field of genetics. What sort of applications can they have in archaeology?

- I believe that genetics can help us to resolve the question of our origins. But we have to be cautious and not take the genetic results as if they were more important than archaeology and human palaeontology.

- What are your main concerns right now?

Unfortunately, since autumn 2002, I have been heavily embroiled in a political skirmish over the destiny of my University. Under the Bush government (the most fascist thing that I have witnessed here), there is a movement aimed at 'corporatizing' certain public universities. Being a 'radical leftist' (actually I am just a moderate Democrat), I am extremely angry and disappointed with the university administration. Although I have little hope of success, I am trying to expose the plot.

- Are you planning to visit Burgos and see for yourself the current state of the Atapuerca sites and the new Museum of Human Evolution?

- I travel to and from Spain quite often. I am involved in an archaeological project in Asturias, and I will probably be granted a Fulbright scholarship at the University of Cantabria in spring 2008. I would like to visit the Museum of Human Evolution, so I imagine I will be able to do that one of these days.

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THE PALAEOOLITHIC OCCUPATION OF EUROPE AS REVEALED BY EVIDENCE FROM THE RIVERS: DATA FROM IGCP 449

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> The Iberian Peninsula offers an alternative migration route from Africa to Europe, via the Strait of Gibraltar. Lower Palaeolithic artefacts are frequently found in situ in fluvial contexts here, particularly in the rivers draining to the Atlantic (...).

The earliest evidence of human occupation includes the presence of non-handaxe lithic industries in bed 3 at Fuente Nueva (Guadix-Baza basin) (...), characterised by reversed polarity (Matuyama chron), has been claimed to slightly pre-date the Jaramillo subchron—ca. 1.1Ma (Martinez-Navarro et al., 2005) (...). Non-handaxe assemblages are also present in the Atapuerca karstic system

in levels just below the Matuyama-Brunhes reversal.

The dating evidence from cave sites as well as fluvial contexts, suggests that the earliest occupation of southern Europe was diachronous; oldest in the east, at ca. 1.8 Ma at Dmanisi in the Caucasus, but only ca. 1Ma in Spain (Fuente Nueva-3). This earliest human population is represented by non-handaxe assemblages.

The first evidence of handaxe-making in Iberia appears around the Matuyama-Brunhes transition. Handaxes appeared in France in MIS 15-14 and in southern England in MIS 13 (...).

After the introduction of handaxe technology into western Europe at ca. 600 ka, it can be envisaged that, in response to climatic cyclicity, the limits of human occupation would have repeatedly fluctuated northward and southward and also eastwards and westwards. During glacial maxima, populations can be presumed to have retreated southward to refugia in southern France and Iberia, returning north when conditions were less hostile. Presumably something similar was also occurring in the non-handaxe-making populations of central and eastern Europe, with the refugia located in the Balkans.

and south poles. It is well known that these polarity swings or inversions have happened at least in the last 2000 million years of the Earth's history. Although they are random, the polarity changes every half a million years on average. Given that the most recent change happened 780,000 years ago (the frontier between the Lower and Middle Pleistocene), some, spurred on by this fall in the strength of the magnetic field, predict that the next change is about to happen. During these exchanges of the magnetic poles, the force of the field, and with it the screen against cosmic rays, is reduced considerably and indeed almost ceases to exist, only to reappear later in the

te. The blink of an eyelid, geologically speaking, but a very slow process in human terms. Our ancestors, including the familiar Homo antecessor, were obviously able to survive polarity inversions in the past.

INTERVIEW Geoffrey Clark Atapuerca project director in 1972

"We came to Burgos dreaming of a Spanish Dordogne"

Geoffrey George Anderson Clark (Philadelphia, Pennsylvania, 1944), PhD in Anthropology and Professor at the University of Arizona (USA), dug in the Main Cave Porch (Portalón de Cueva Mayor) in 1972 while working on a research project, The North

tableland in northern Burgos. What drew us to this region were the caves and shelters you can see from the main highway on the cliffs above the Ebro River valley before you cross El Escudo pass. We were dreaming of a Spanish Dordogne with dozens of Palaeolithic sites. However, we soon discovered that the caves and shelters that initially seemed so promising actually contained recent occupations. They only had remains from the Neolithic and the Bronze Age. Atapuerca lay within the boundaries of the survey.

- How would you describe the Spain, the city and the society of Burgos that you encountered?

- Those were the last years of the

red from the fixed disapproving gaze of their parents, the priest and the police. Geoff Clark and I interrupted that function when we went to dig there". How do you recall that curious situation?

- Funny, but it was not so strange back then, when Spanish society was still very conservative. It was not the first time that I had noted this sort of behaviour (maybe it is universal amongst young people). I had seen it in the USA, Mexico, England, France and Iran. I can remember my own experience as an adolescent in the 1960's...

- You were a pioneer in Spain with your use of a quite innovative prospecting method.

- Prehistory in the USA in the