

Press release
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A new discovery of a pre-Neanderthal in France: the Tourville-la-Rivière man

On the prehistoric site of Tourville-la-Rivière (Seine-Maritime, Normandy), a team of archaeologists from the French National Institute for Preventive Archaeological Research (Inrap) has discovered the remains of a pre-Neanderthal. This important discovery has recently been published in the international journal PLOS ONE by a group of researchers from the CNRS, Inrap, the Australian National University, the National Research Centre on Human Evolution of Burgos and the Department Anthropology of the Washington University in Saint Louis.

Although many Prehistoric sites have been excavated since the 19th century, human fossils dating from the Middle Pleistocene (781 000 – 128 000 BCE) remain rare in Northwestern Europe. Apart from two fragmented skulls found at Biache-Saint-Vaast in the North of France, the rare human fossils from this period have been unearthed on 10 sites in Germany and Great-Britain. The Tourville-la-Rivière individual therefore constitutes a major discovery in Europe in terms of understanding Mid-Pleistocene human settlement.

The pre-Neanderthal of Tourville-la-Rivière

The fossils comprise three bones from the left arm from the same individual (humerus, ulna and radius). The palaeoanthropological study and the morphological and metric analyses have confirmed that they belong to the Neanderthal lineage. These fossils and the human occupation at Tourville-la-Rivière are dated from 236 000 to 183 000 BCE. Five samples of human bone and eight samples of animal teeth were analysed for ²³⁸U radioactive isotopes and using Electro spin resonance (ESR). While it is impossible to determine the sex of this individual the diaphyses of the three bones indicate that they could belong to an older teenager or an adult.

In the absence of any human intervention or disturbance of the bones by carnivore, only one scenario appears most likely: the pre-Neanderthal arm was transported by the river Seine before being deposited, with or without its hand, on the sand banks of the river at the foot of the chalk cliffs of Tourville-la-Rivière.

A Neanderthal with Enthesopathy?

The Tourville specimen is the oldest human fossil with an unusual bone ridge where the posterior part of the deltoid muscle is attached to the humerus. This anomaly probably results from repetitive movement - perhaps the action of throwing - of the posterior deltoid muscle and it can be compared to similar bone ridges observed on modern athletes.

Even if this anomaly had no incidence on the individual's survival, it raises questions about individual and collective behaviour as well as the everyday life of hominids in the Middle Palaeolithic.

Tourville-La Rivière 200 000 years ago

A Prehistoric and Paleontological site, Tourville-la-Rivière is located in one of the many meanders of the Seine valley, 14 km south of Rouen. It has an important 30 m thick stratigraphic sequence, which lies on the lower terraces of the Seine valley. The stratigraphy includes successive alluvial layers that have been deposited between 350 000 and 130 000 BCE. The 2010 excavation of a 1 hectare

area concentrated on the layers containing remains characteristic of the interglacial period dating to about 200 000 years ago.

Fauna from a temperate climate

The animal species found on the site are characteristic of the end of the interglacial period: deer, aurochs and two equine species (including the European ass) were found alongside boar, rhinoceros and several species of carnivore such as wolf, fox, bear and panther. As well as these larger mammals, smaller species such as the wild cats or rodents (beaver, hare) were also discovered. This accumulation is mainly the result of natural phenomena as whole or partial carcasses of animals were transported by the river and deposited on the sandbanks at Tourville-la-Rivière.

Surprisingly sophisticated and efficient tools

Worked flint proved to be quite rare on the site in relation to the excavated area (500 objects per hectare). Blades and flakes were produced using a particularly complex process, called the Levallois method. Many of the pieces came from a small 3m² débitage area that included 300 objects. They provide important information concerning the objectives of the pre-Neanderthal flint knappers. Levallois flakes and blades are remarkably efficient from a functional perspective, fulfilling immediate needs for processing animal carcasses (meat, tendons and skin) found on the banks of the river Seine.

Publication reference

FAIVRE J.-Ph., MAUREILLE B., BAYLE P., CREVECOEUR I., DUVAL M., GRÜN R., BEMILLI C., BONILAURI S., COUTARD S., BESSOU M., LIMONDIN-LOZOUET N., COTTARD A., DESHAYES T., DOUILLARD A., HENAFF X., PAUTRET-HOMERVILLE C., KINSLEY L., TRINKAUS E. – 2014. The Middle Pleistocene human remains from Tourville-la-Rivière (Normandy, France) and their archaeological context. PlosOne <http://dx.plos.org/10.1371/journal.pone.0104111>

The scientific research has been led by specialists from the western interregional office of Inrap, the laboratory « From Prehistory to today : culture, environment et anthropology » (CNRS/Bordeaux University/Ministry of Culture and Communication), in collaboration with the Physical Geography Laboratory: Quaternary and Present environments (CNRS/ Universities of Paris 1 and Paris East Creteil Val de Marne) and the laboratory "Archaeologies and Antiquity Sciences (CNRS/ Universities of Paris 1 and Paris West Nanterre La Défense/ Ministry of Culture and Communication) in France.

Inrap

With approximately 2,000 collaborators and researchers, Inrap is the largest operator in preventive archaeology in France and one of the first in Europe. A national research institute, it carries out most of the evaluations and excavations with both private and public developers: around 2,000 sites per annum, throughout metropolitan France, as well as in French Guyana, Guadeloupe and Martinique. Its missions include scientific research and sharing knowledge of archaeology with the general public. Amongst its most recent discoveries are the Epigravettian tomb of Cuges-les-Pins (Rhône), the Neanderthal butchering sites of Caours (Somme) and Quincieux (Rhône) the mammoth at Changis-sur-Marne and the Mesolithic man of the rue Farman site, the oldest known Parisian to date.

The CNRS

Founded in 1939, the National Centre for Scientific Research is a public research body (Public Scientific and Technical Research Establishment, under the supervision of the Ministry of Education, Higher Education and Research). It acquires knowledge which it puts to the service of today's society. With over 33 000 employees nationally, the CNRS is implicated in all fields of study using its 1100 research and service groups.

With 19 Nobel prizes and 12 Fields medals the CNRS has a long tradition of excellence.



The 2010 excavation at Tourville-la-Rivière

Developer **CBN (Carrières et Ballastières de Normandie)**

Scientific control **Regional Service of Archaeology (Drac Haute-Normandie)**

Archaeological research **Inrap**

Site director **Jean-Philippe Faivre, Inrap (2010-2012), CNRS PACEA**

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