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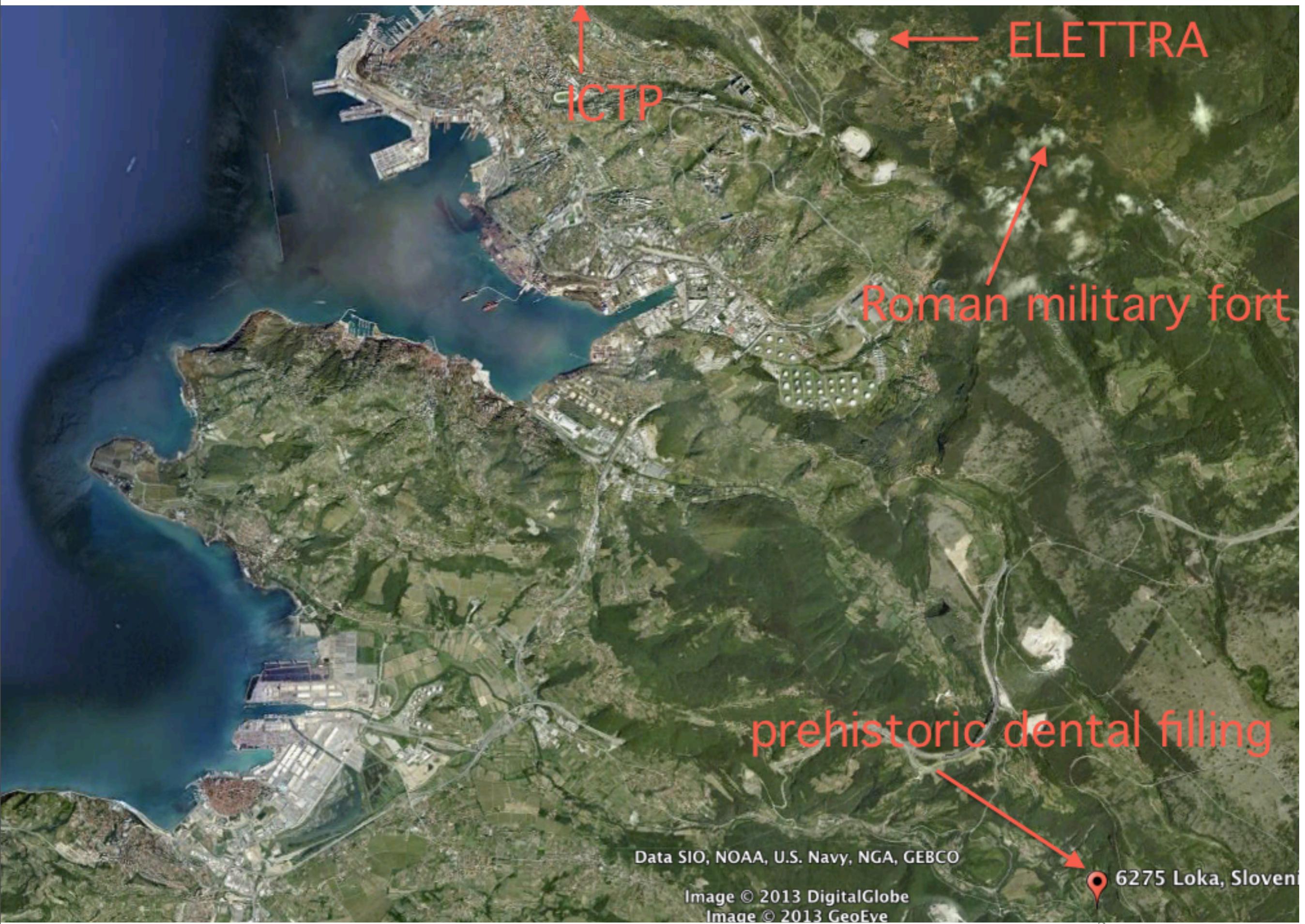


Physics and Archaeology

Claudio Tuniz

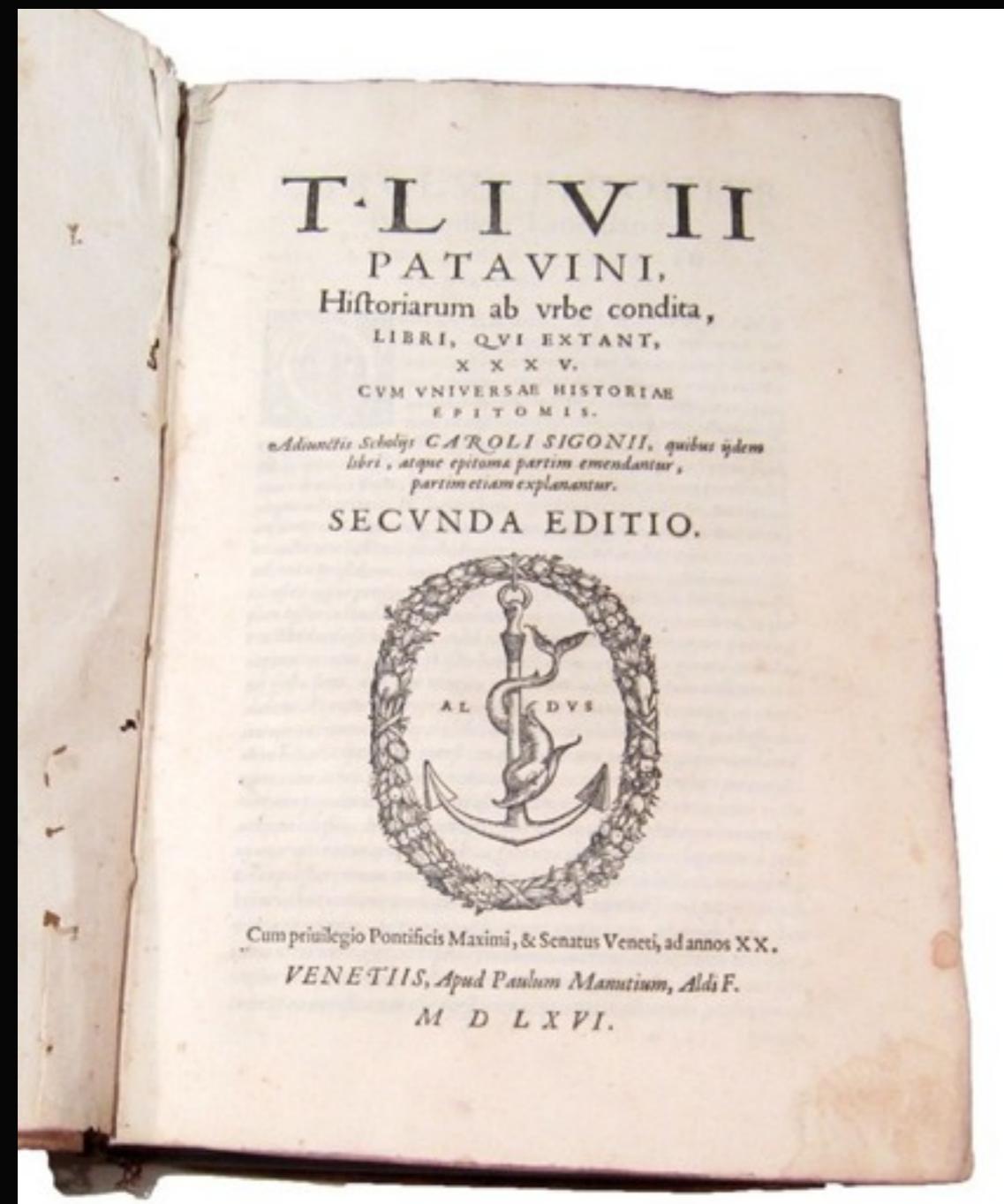
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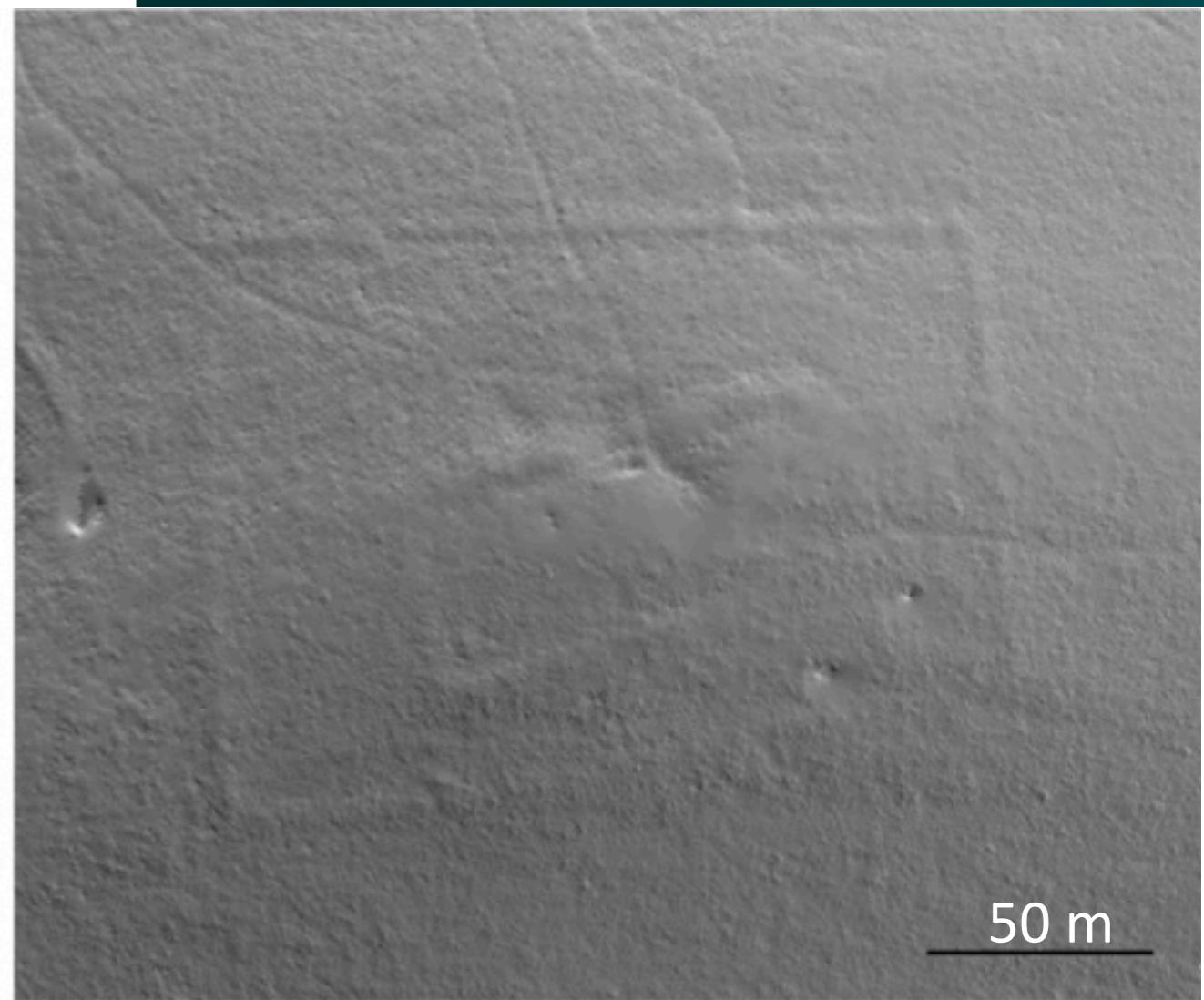
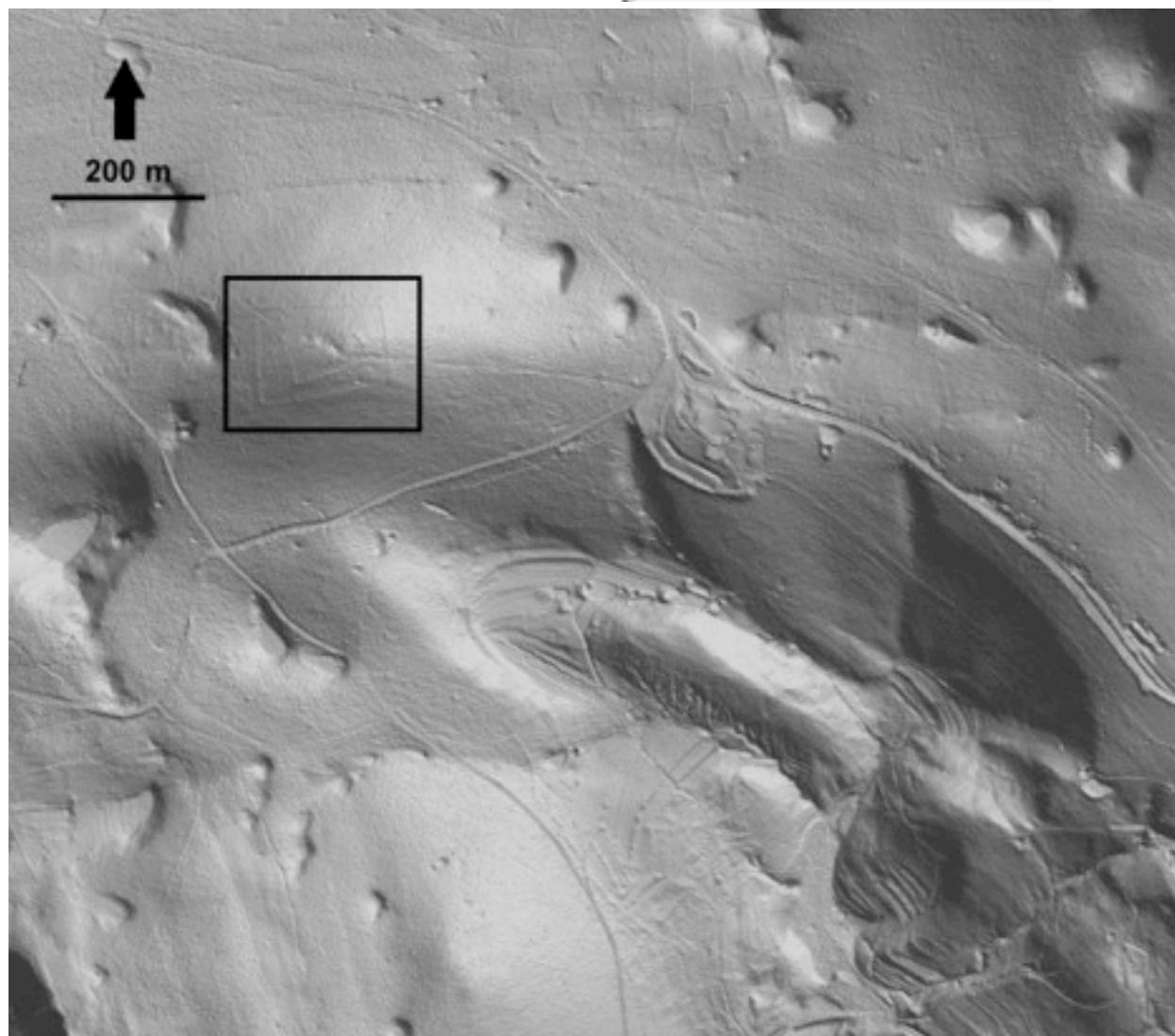
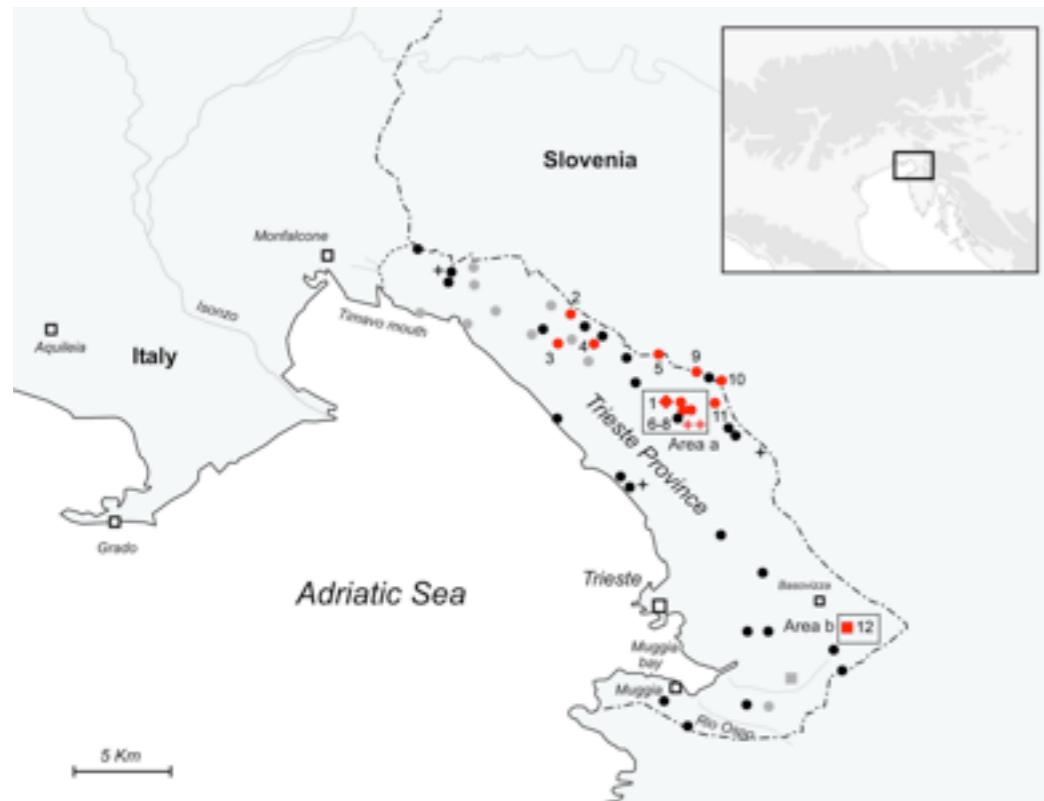


3

The oldest Roman military camp in Europe



Aquileia

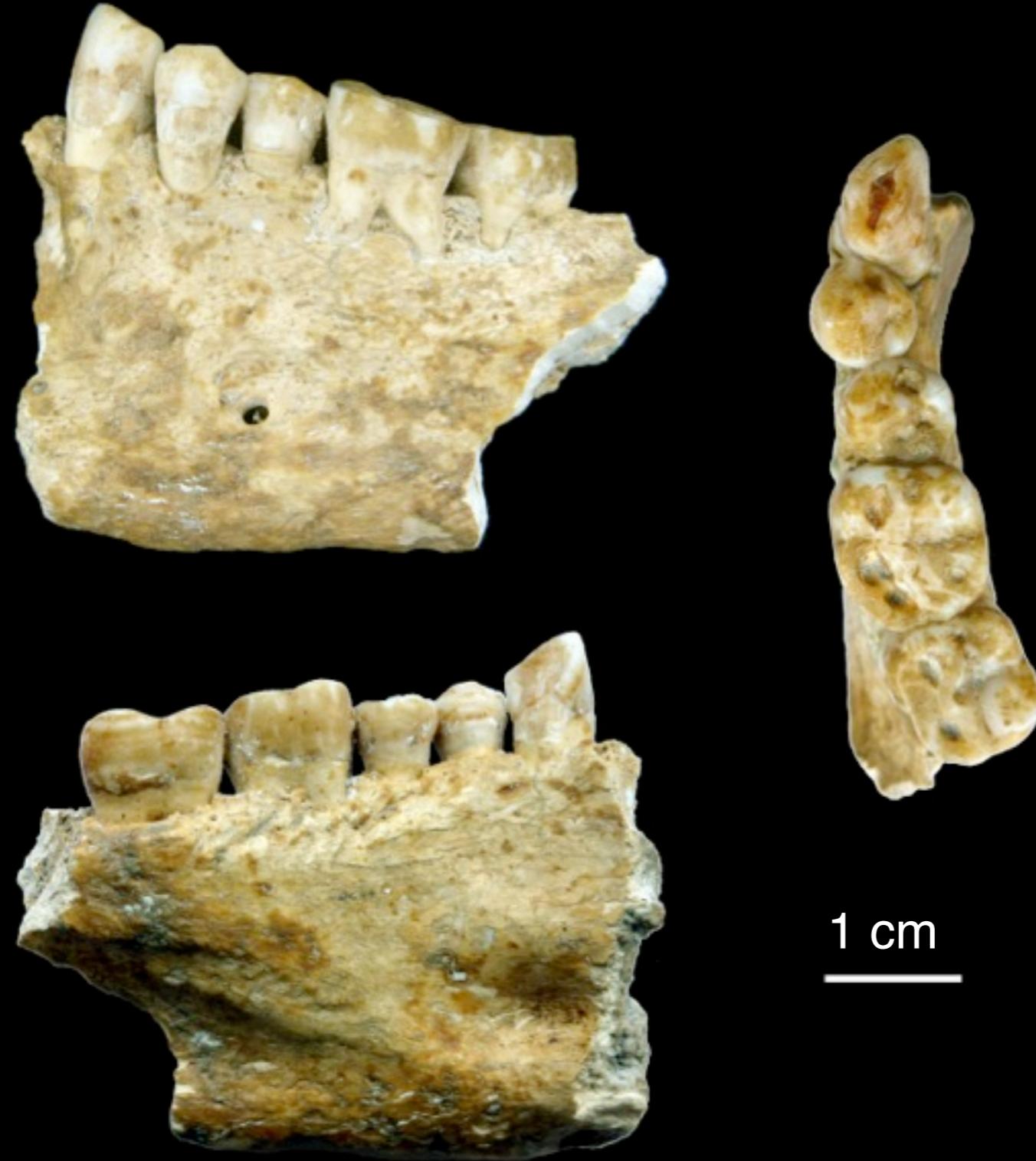


Dentistry during the Stone Age

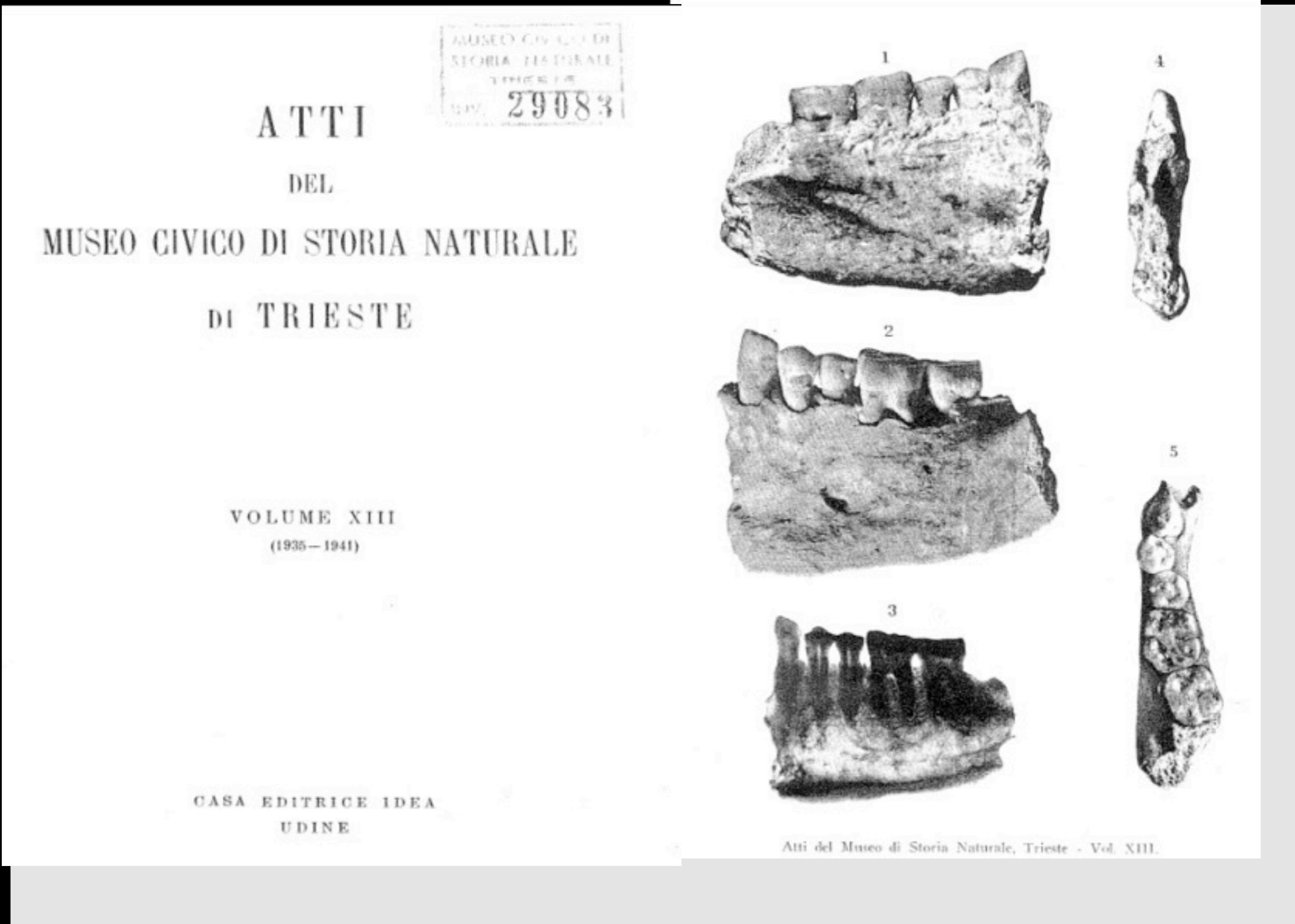


Giuseppe Müller (1880-1964)

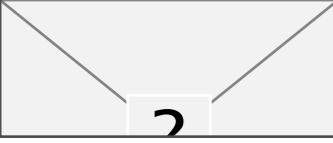
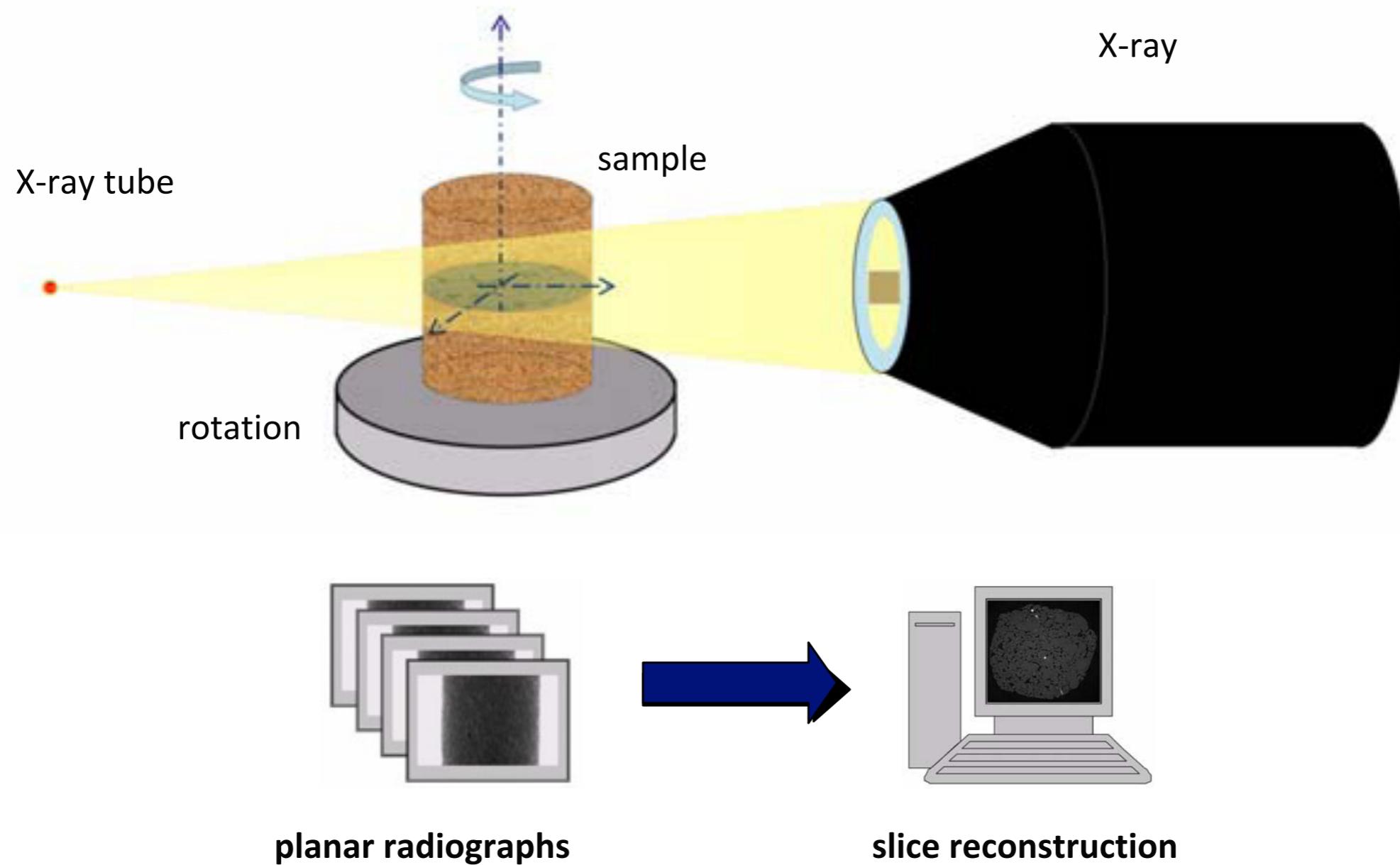


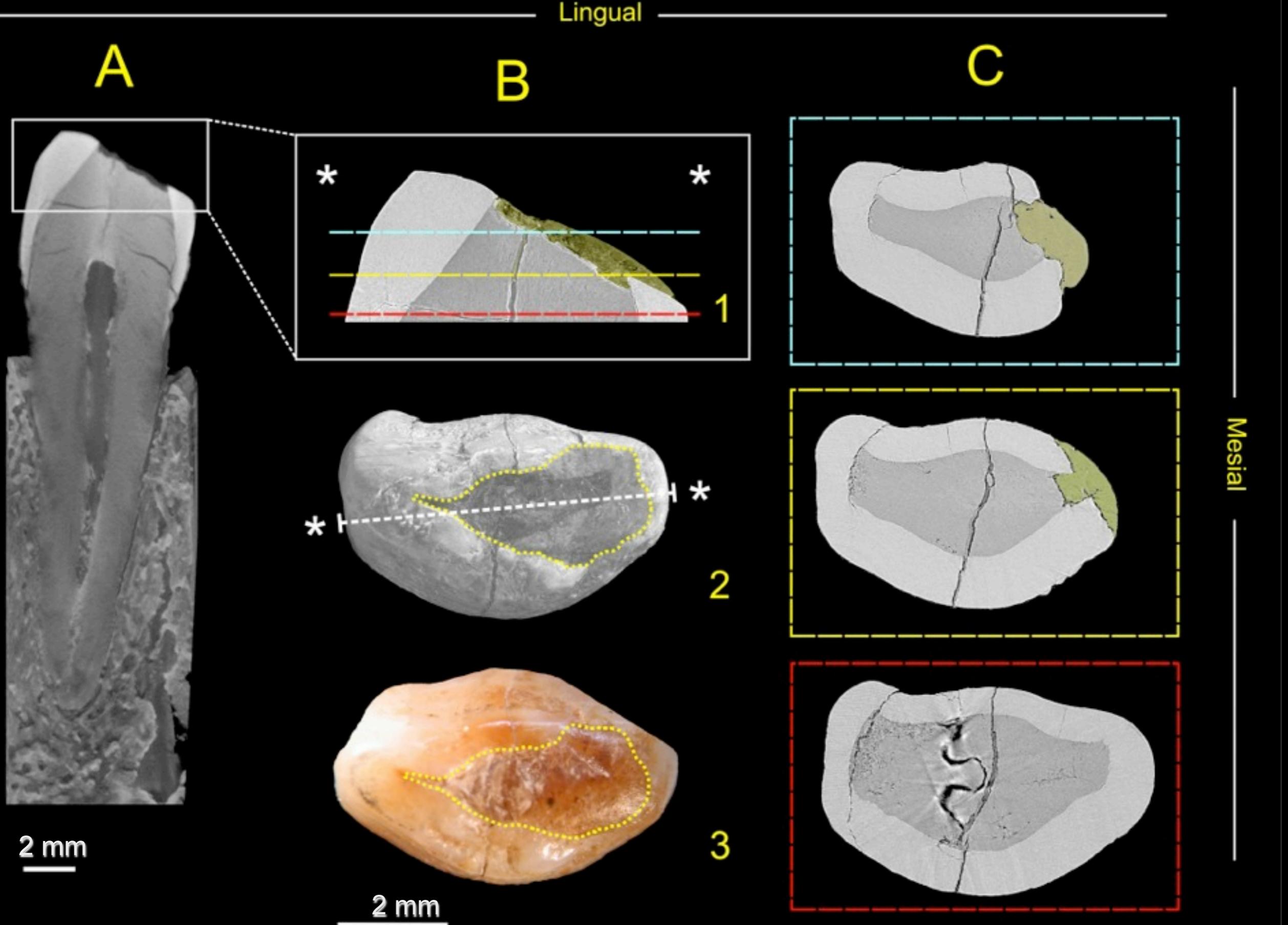


*Cenni preliminari su un ritrovamento di mandibola umana
fossile in una caverna dell'Istria settentrionale*
Roberto Lepori, Trieste, 1937





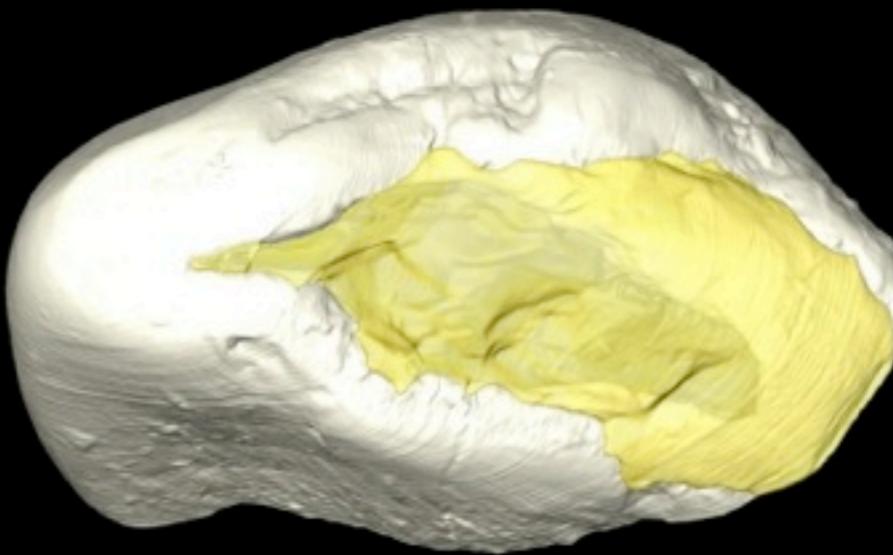
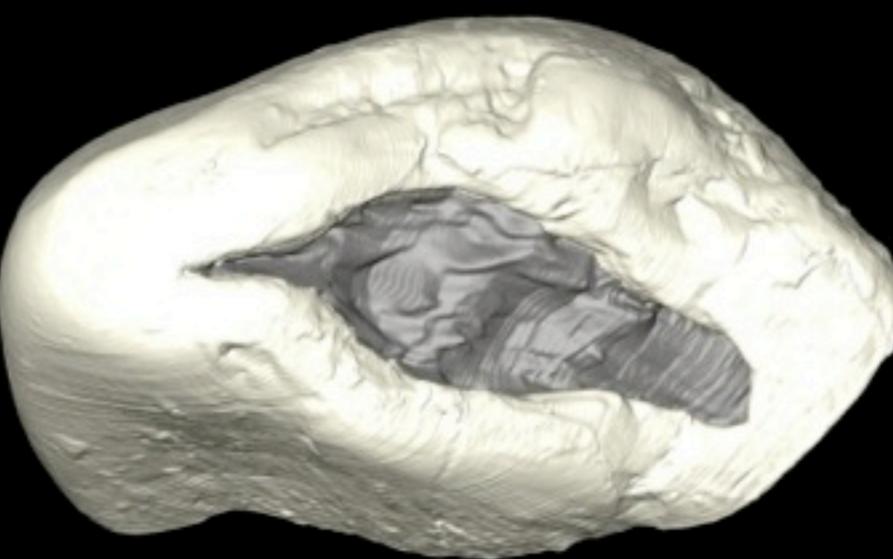
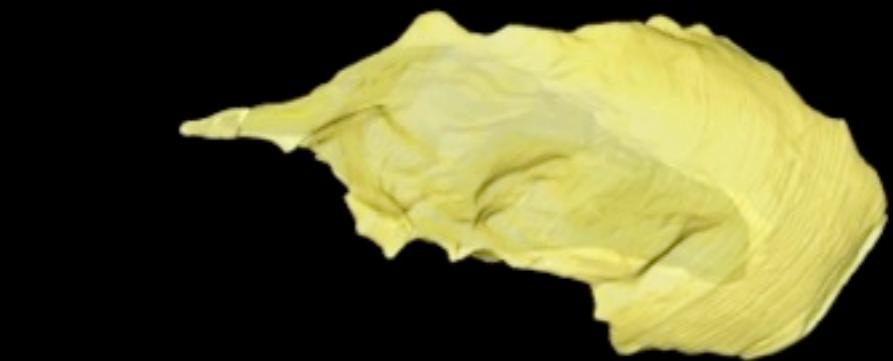
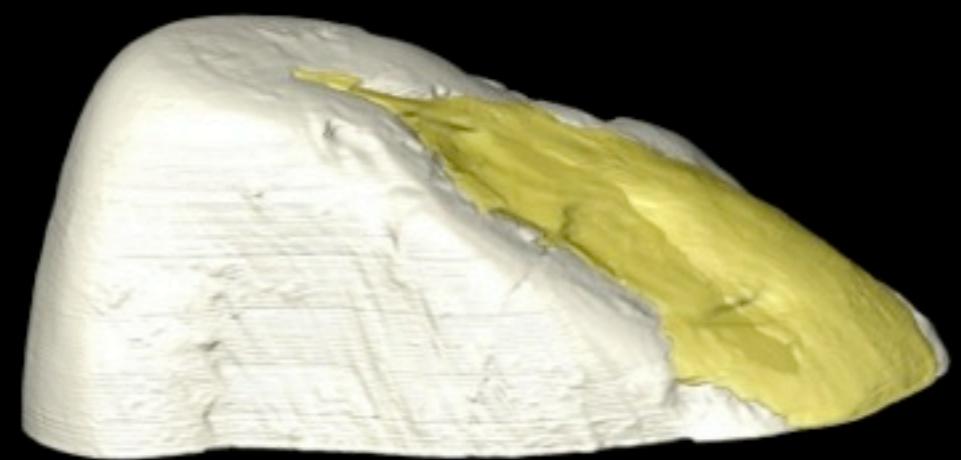
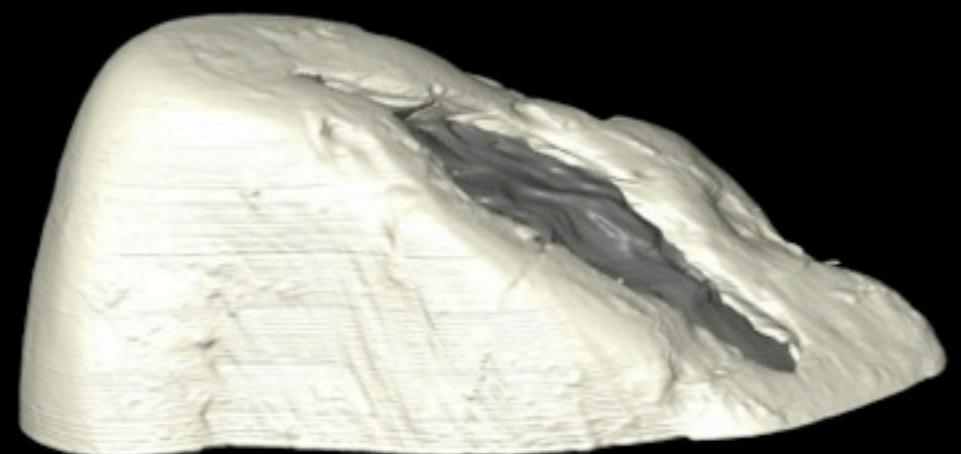
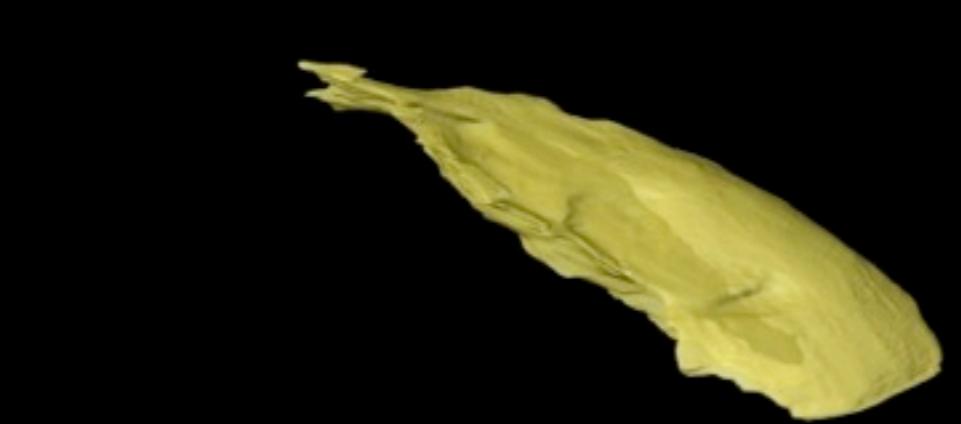




Radiocarbon



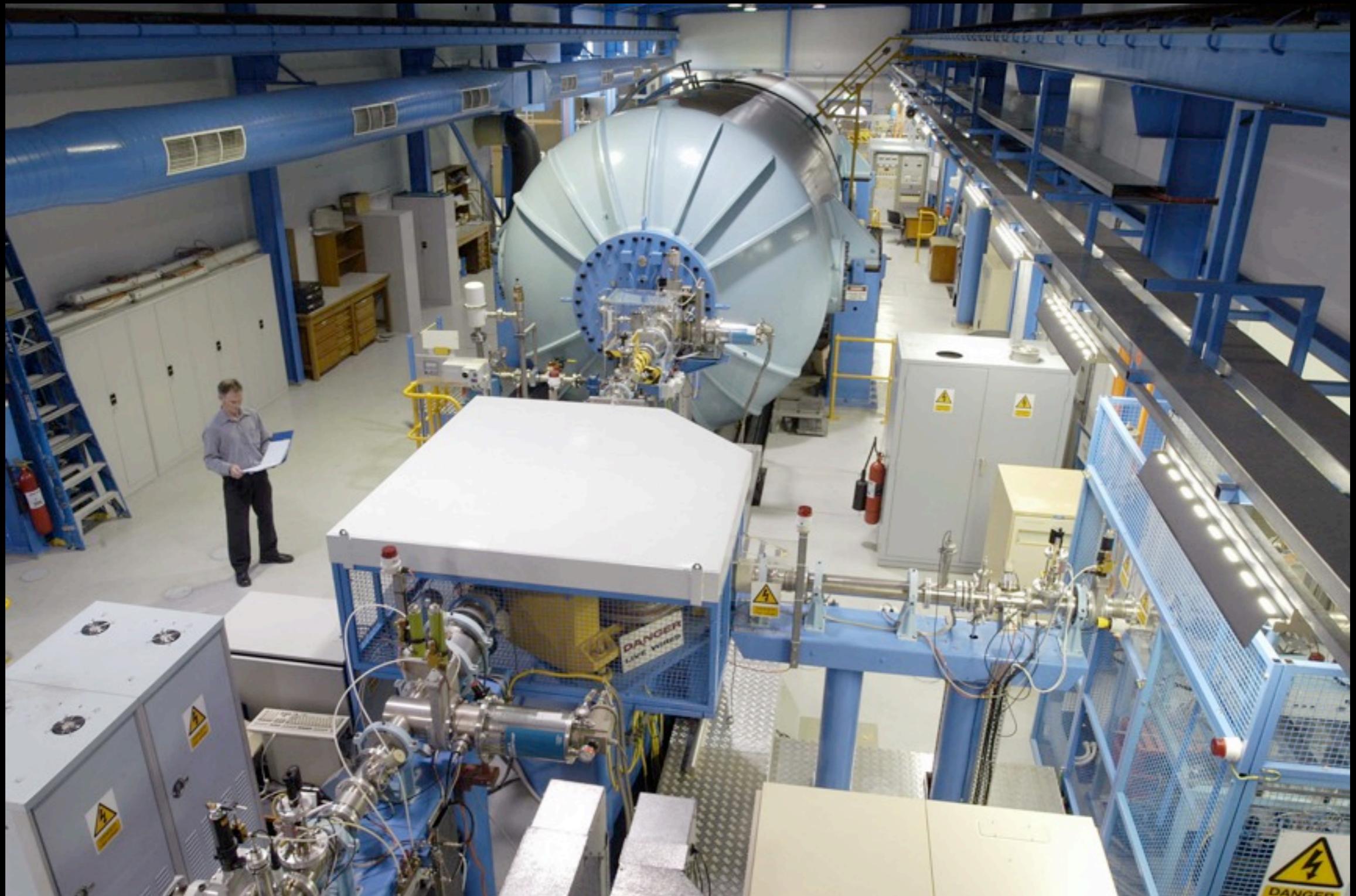
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Discoveries in this ancient jawbone indicate the earliest evidence of therapeutic dentistry.

September 19th, 2012
6:00 PM ET

Oldest tooth filling may have been found

We all know the drill. Skip up on your regular brush-and-floss routine, and you may wind up at the dentist's office with a cavity that needs to be filled. But what people did about their toothaches thousands of years ago?

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ROLEX AND THE RYDER CUP
UNITED BY THE PURSUIT OF EXCELLENCE
THROUGH TEAM SPIRIT.
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A Beeswax Dental Filling That Lasted 6,500 Years

By SINDYA N. BHANCO
Published: September 24, 2012

Ancient dentistry has been discovered in a 6,500-year-old human jawbone: a lump of beeswax that appears to be the earliest evidence of a dental filling.

(Enlarge This Image)

The beeswax was probably applied to ease pain from a crack in the enamel and dentin layers of the tooth, said Claudio Tuniz, a nuclear paleoanthropologist at the Abdus Salam International Center for Theoretical Physics in Italy.



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Oldest dental filling is found in a Stone Age tooth

21:00 19 September 2012 by Colin Barras

Science - NBCNEWS.com

65 centuries ago, this old chap got a beeswax dental filling

Slovenia find may be earliest known example of therapeutic dentistry — if he was still alive

Next story in None Seamount teams with dazzling sea life

By Charles Choi
updated 9/19/2012 6:30:26 PM ET

Tough on sweat. Not on skin.

avait entre 24 et 30 ans lors de sa mort. Mais s'il a été découvert au siècle dernier, jamais personne n'avait observé l'étrange opération. Décrite et cataloguée, la mâchoire avait en effet été logée à un musée à proximité de la ville de Trieste sans que davantage d'observations ne soient faites. "La mâchoire est restée au musée pendant 101 ans sans que personne ne note quoi que ce soit d'étrange", confirme Claudio Tuniz du International Abdus Salam de physique théorique, en Italie, ceux-ci ont observé une dent très 'réparée' à... la cire d'abeille.

L'ossement en question appartient selon les spécialistes, à un homme qui avait entre 24 et 30 ans lors de sa mort. Mais s'il a été découvert au siècle dernier, jamais personne n'avait observé l'étrange opération. Décrite et cataloguée, la mâchoire avait en effet été logée à un musée à proximité de la ville de Trieste sans que davantage d'observations ne soient faites. "La mâchoire est restée au musée pendant 101 ans sans que personne ne note quoi que ce soit d'étrange", confirme Claudio Tuniz du International Abdus Salam de physique théorique, en Italie, ceux-ci ont observé une dent très 'réparée' à... la cire d'abeille.

Así es la dentina de un diente de 6.500 años que los científicos descubrieron en Eslovenia.

Científicos hallan posible evidencia más antigua de una reparación dental

Investigadores en Italia descubrieron una cotorroación en el diente superior de un hombre que vivió hace 6.500 años en Eslovenia.

Actualizado: 19 de septiembre de 2012 a las 21:30

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NATIONAL GEOGRAPHIC ITALIA

I dentisti del Neolitico

Alcuni ricercatori hanno scoperto un'inserzione fatta con cera d'api in un dente fossile di 6.500 anni fa. Secondo gli studiosi si tratta del più antico intervento dentale terapeutico.

Aggiungi questo articolo | **Stampa** | **Commenta** | **Scrivimi** | **Scrivimi su Facebook** | **Scrivimi su Twitter** | **E-mail**

BEASTS

Le vesicole fissate alla corona dentaria sono possibili anche per le carie prodotte da un dente quattro o cinque volte più vecchio di quelle prodotte per un dente quattro o cinque volte più vecchio (ICTP/Courtesy).

THE TIMES | THE SUNDAY TIMES | TIMES+

Des dentistes au Néolithique ?

Partager | 179

Info rédaction, publiée le 20 septembre 2012

Publiant leur étude le 19 septembre sur PLoS ONE, des chercheurs italiens ont observé, sur une dent humaine vieille de 6.500 ans provenant de Slovénie, une abîtrechure colmatée à la cire d'abeille : les premiers soins dentaires de la Préhistoire ?

C'est sur une mâchoire humaine fossilisée remontant à 6.500 ans, découverte en Slovénie, que des chercheurs ont fait l'énorme trouvaille. Dirigés par Federico Bernardini et Claudio Tuniz, du Centre international Abdus Salam de physique théorique, en Italie, ceux-ci ont observé une dent très 'réparée' à... la cire d'abeille.

L'ossement en question appartient selon les spécialistes, à un homme qui avait entre 24 et 30 ans lors de sa mort. Mais s'il a été découvert au siècle dernier, jamais personne n'avait observé l'étrange opération. Décrite et cataloguée, la mâchoire avait en effet été logée à un musée à proximité de la ville de Trieste sans que davantage d'observations ne soient faites. "La mâchoire est restée au musée pendant 101 ans sans que personne ne note quoi que ce soit d'étrange", confirme Claudio Tuniz du International Abdus Salam de physique théorique, en Italie, ceux-ci ont observé une dent très 'réparée' à... la cire d'abeille.

Apprezzato da 1,8 milioni di pazienti.

smh.com.au | The Sydney Morning Herald

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Need a filling? Stone Age dentists knew their beeswax

September 20, 2012

Maria Philippa | Science Reporter | View more articles from Maria Philippa | Follow Maria on Twitter | E-mail Maria

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Lek przed dentystą musiał być nieobcy naszym przodkom już 6500 lat temu.

Własny naukowcy z Centrum Fizyki Teoretycznej w Trieście doknęli wiosennej wypowiedzi w zapisie sprzed 6500 lat. Zostały wzięte pod kopy tyko po to, aby prowadzić nowy aparat mierzący

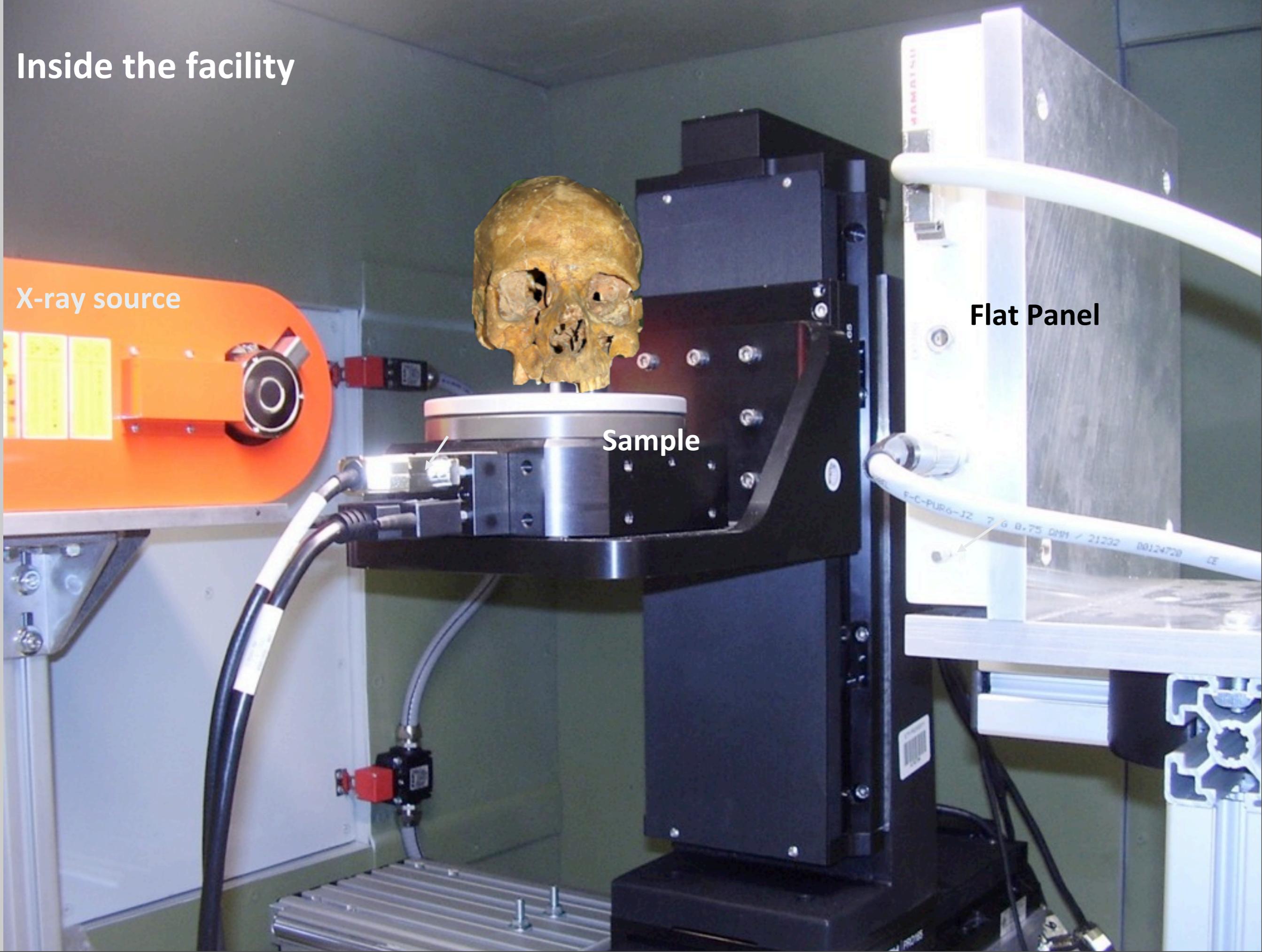
Chodzi o tą następującą miedzy do 24-30-letniego mieszkańców neolitu, w tym synchrone, AMS-owy mikroskop elektronowy. Jeden

Claudio Tuniz, Federico Bernardini i Abdus Salam postawili potwierdzony makrelaki przy pomocy nowych technik, dostępnego w ich laboratorium, w tym synchronie, AMS-owy mikroskop elektronowy. Jedynym

ICTP Public Information Office

Thursday, May 2, 13

Inside the facility



The Neanderthal Molare jaw

Rockshelter II Molare (Scario), Campania

Middle Paleolithic



Ronchitelli A. et al. 2005

Italian Neanderthal child ~ 100 thousand years



The Divje babe flute, Mousterian, about 50000 years old, Slovenia



DID NEANDERTHALS PLAY MUSIC? X-RAY COMPUTED MICRO-TOMOGRAPHY OF THE DIVJE BABE 'FLUTE'*

C. TUNIZ,^{1,2} F. BERNARDINI,¹ L. TURK,³ L. DIMKAROSKI,⁴ L. MANCINI⁵ and D. DREOSSI⁶

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²Centre for Archaeological Science, University of Wollongong, NSW 2522, Australia

³Ex-research advisor of Institute of Archaeology SBC, Ljubljana 1000, Slovenia

⁴SNG Opera and Ballet, 5 Ljubljana, Ljubljana 1000, Slovenia

⁵Elettra Sincrotrone Trieste, 14 Strada Statale, Trieste, Bassovizza 34049, Italy

Archaeological evidence for wind musical instruments made by modern humans has been well established from the Upper Palaeolithic in Europe. Musical instruments evidently made by Neanderthals have not been found so far. The most controversial object is a juvenile cave bear femur with two complete holes, found in 1905 in the Middle Palaeolithic layers of the Cave Divje babe I, Slovenia. The bone was interpreted as a possible Neanderthal 'flute', but some scholars have firmly rejected this hypothesis on the basis of taphonomic observations, suggesting a carnivore origin for the holes. Here, we show the results of X-ray computed micro-tomography (XCT) performed on the Divje babe I 'flute'. Our analyses demonstrate that there were originally four holes, possibly made with pointed stones and bone tools. Most surface modifications near the holes, previously interpreted as effects of carnivore gnawing, are post-depositional marks. Furthermore, a thin layer has been removed around one of the complete holes, producing a flat surface, possibly to facilitate perforation. The new data show that a Neanderthal manufacture of the object cannot be ruled out.

KEYWORDS: MICRO-COMPUTED TOMOGRAPHY, DIVJE BABE I 'FLUTE', NEANDERTHAL

INTRODUCTION

Music is a characteristic expression of modern human culture (Jerison 2000), but there are no anatomical or other biological barriers (Finsyter and Nicolay 2000) to its presence in the Neanderthal cultural package, which included the symbolic use of marine shells and mineral pigments (Zilhão *et al.* 2010) and, possibly, language (Krause *et al.* 2007).

The oldest musical instruments are bone and ivory flutes with two to five finger holes. More than 120 specimens have been found throughout Europe in Upper Palaeolithic sites linked to modern humans. The most famous are from the Isturitz Cave in France and some German caves, including Vogelherd, Geissenklösterle and Hohle Fels (Conard *et al.* 2009). Flutes from these three German caves are Aurignacian and are considered to be the oldest Upper Palaeolithic musical instruments in Europe (about 36 ka). Similar finds from the Gravettian and the Magdalenian are mostly made on bird bones, but there are other examples fashioned from mammal bones (e.g., Pas du Miroir, France; Grubgraben, Austria) (Eiswögerer and Käfer 1998; Atzeni 2004).

Putative musical instruments from cave sites in Eastern Europe, ranging from the Mousterian to the Aurignacian (Horusitzky 2003), consist of perforated limb bones of cave bears. Other



In collaboration with National
Museum of Slovenia, Ljubljana

*Received 5 November 2010; accepted 25 June 2011
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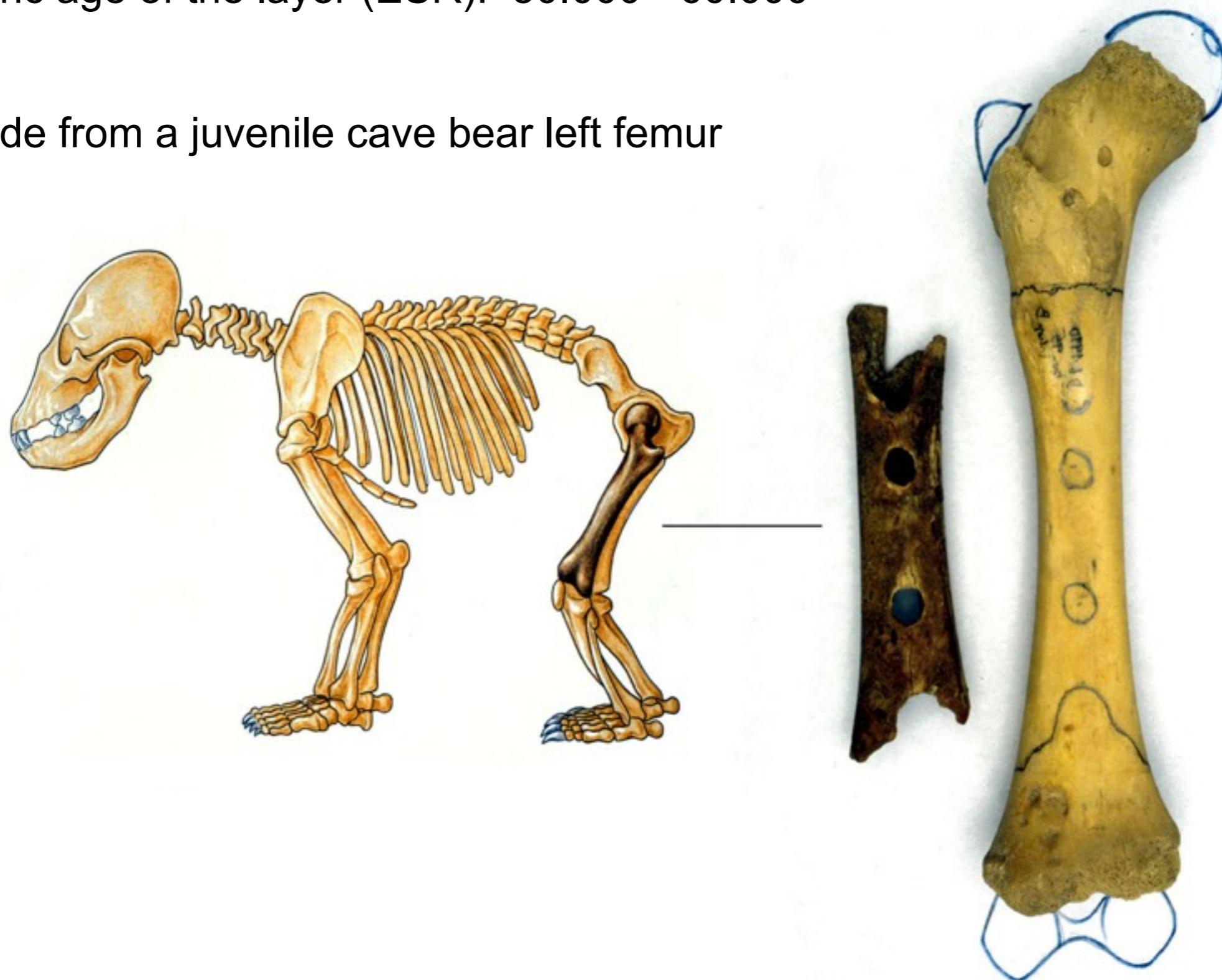
Divje babe cave



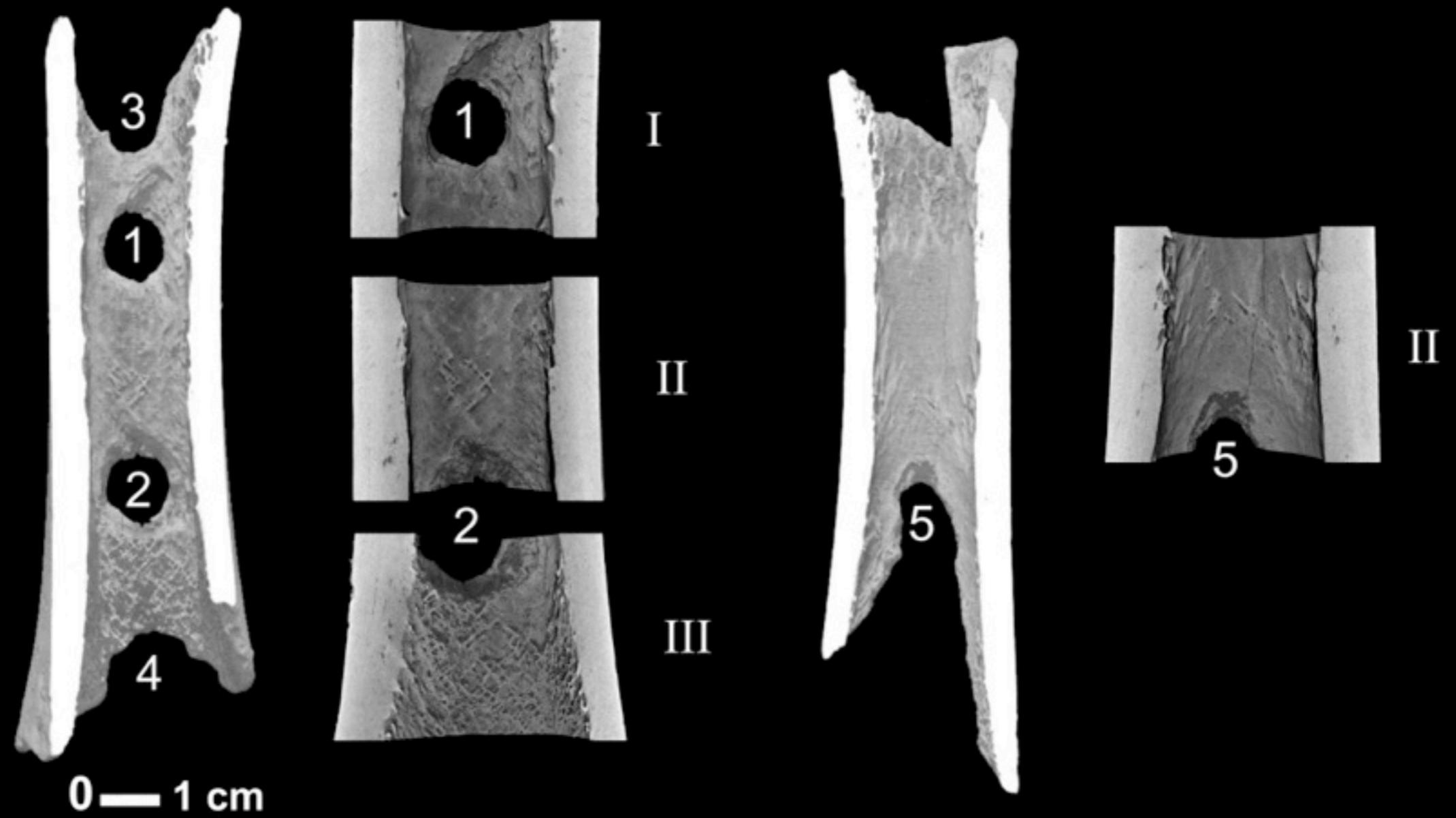
The flute was discovered in 1995 between two hearths cemented into a solid breccia.

Radiometric age of the layer (ESR): 50.000 - 60.000 years BP

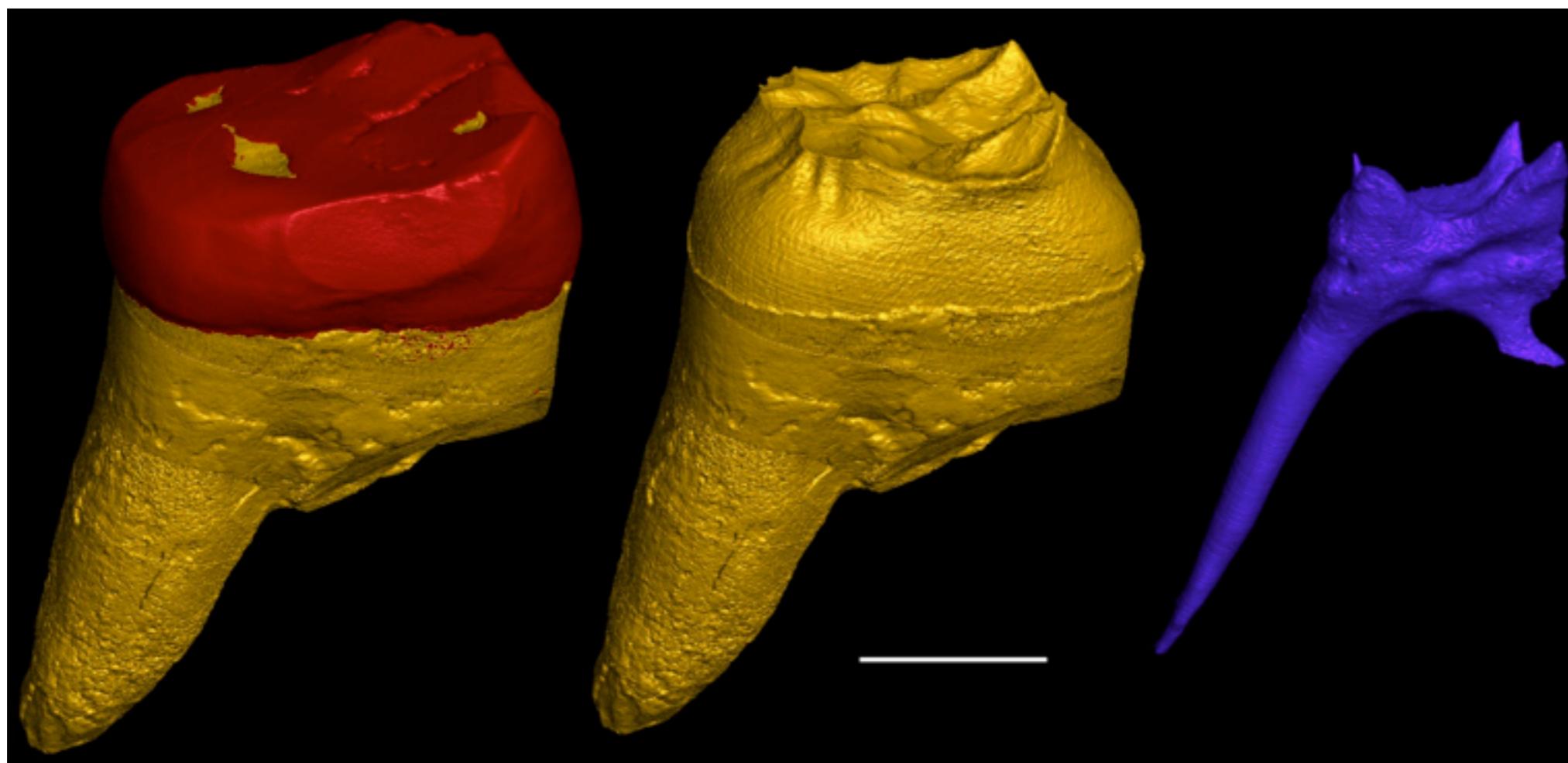
It was made from a juvenile cave bear left femur



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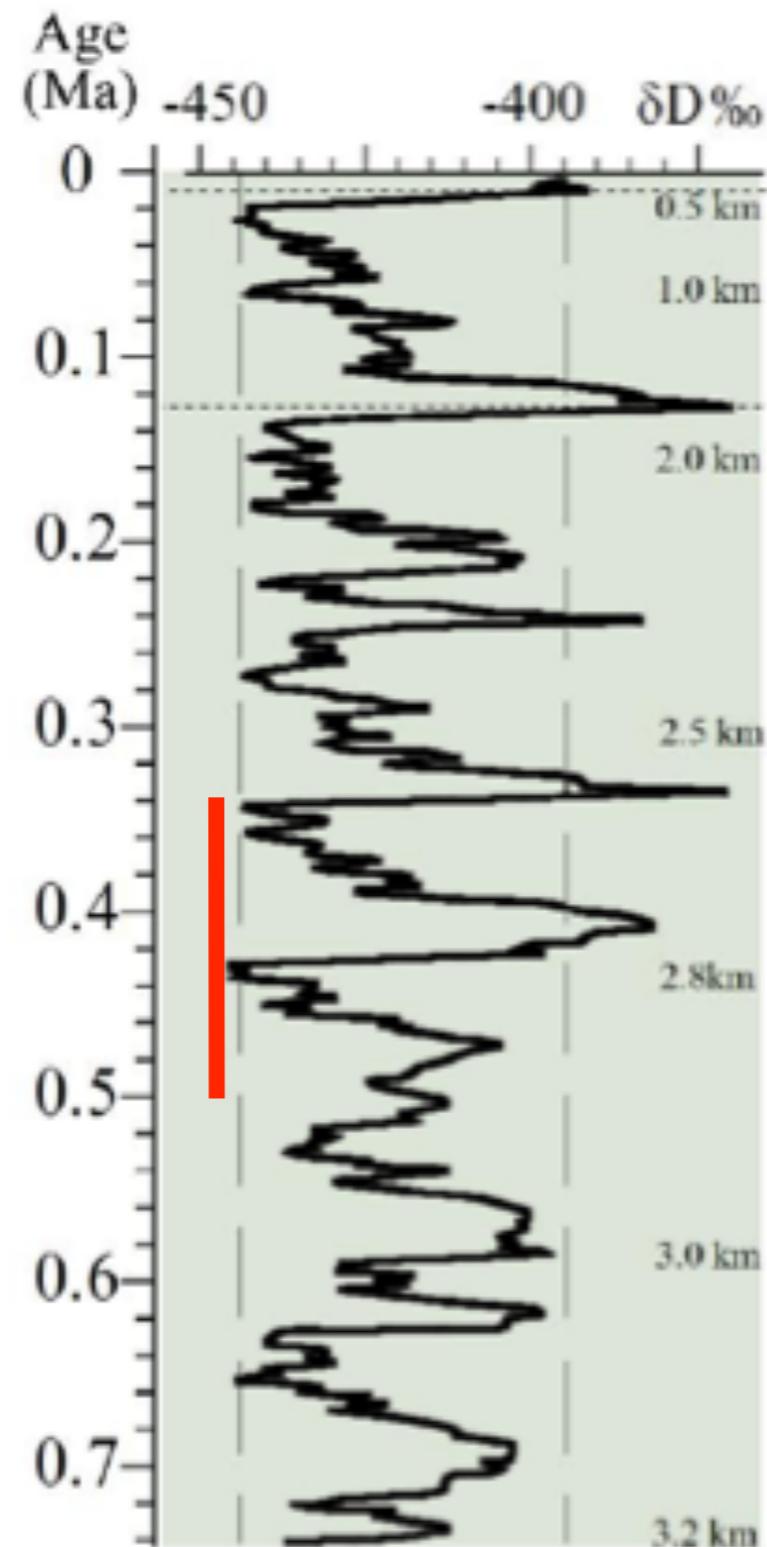


L'uomo di Visogliano



Paleoclimate

EPICA – Barbara Stenni 2007



H heidelbergensis
Visogliano

Carso 400 mila anni fa

Carso 400 mila anni fa



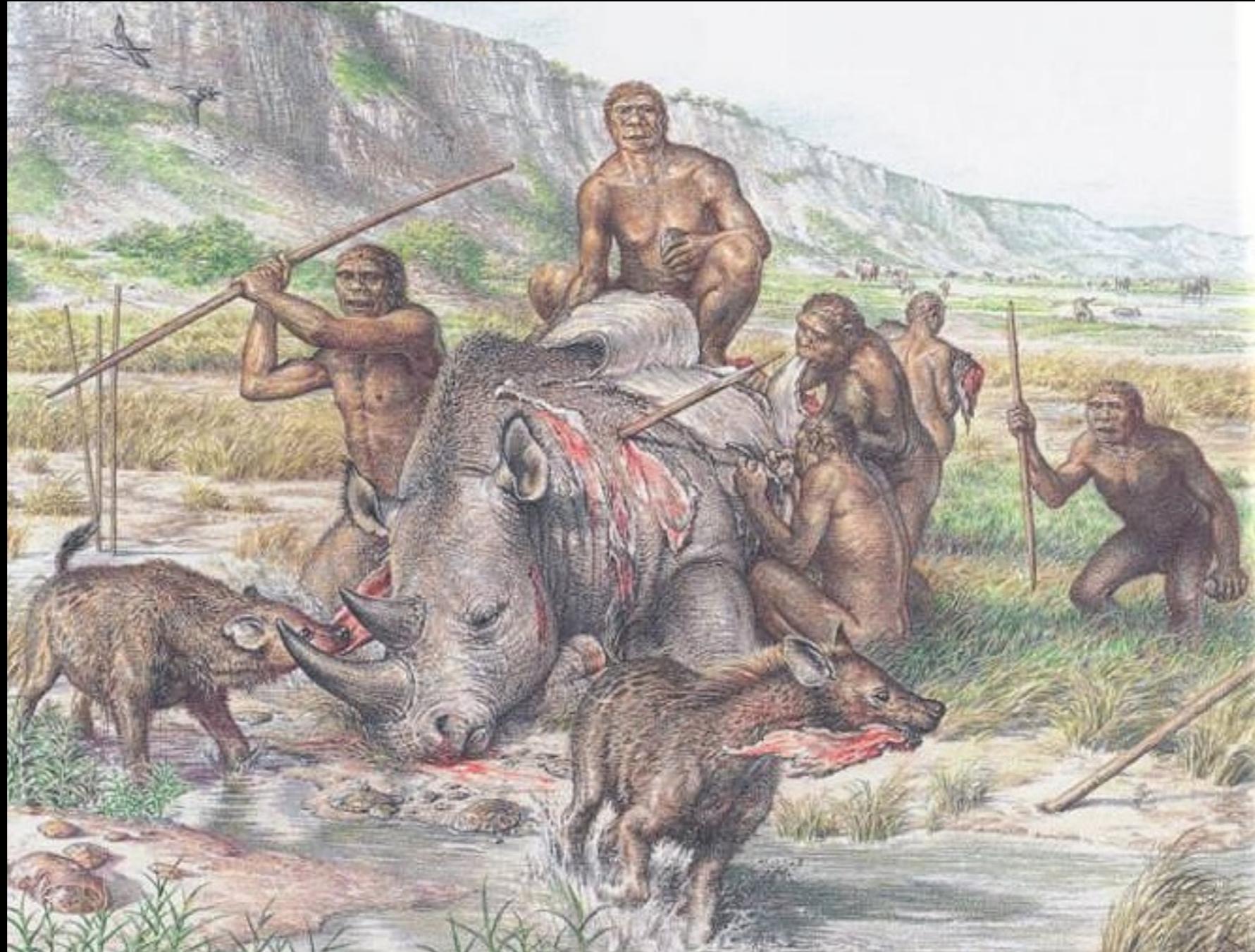
Carso 350 mila anni fa



stephanorhinus hundsheimensis



A caccia sul Carso



C. Tuniz G. Manzi D. Caramelli

La scienza delle nostre origini



 *Editori Laterza*