

# BRIEFING YOU

*about our*

## Field School for Quaternary Palaeoanthropology and Prehistory of Murcia, S.E. Spain

### 29<sup>th</sup> Field Season 2018

**MUPANTQUAT**

**Chair: Michael J. Walker**

Honorific Professor Emeritus

*Department of Zoology and Physical Anthropology,  
Biology Faculty  
Murcia University,  
30100, MURCIA (SPAIN)*  
email: mjwalke@gmail.com

#### Dates of our 2018 sessions:

**SESSION 1 : June 29<sup>th</sup> (Fri.) – July 20<sup>th</sup> (Fri.) 2018**

at Cueva Negra del Estrecho del Río Quípar

**SESSION 2 : July 20<sup>th</sup> (Fri.) –August 10<sup>th</sup> (Fri.) 2018**

at Sima de las Palomas del Cabezo Gordo

#### **ABSTRACT**

The main objective of the research project is to increase the finds of Pleistocene hominin fossils, along with stone tools, prehistoric animals, and remains of fire, by excavation at two sites, **Cueva Negra (Black Cave) del Estrecho del Río Quípar de La Encarnación** and **Sima de las Palomas (Dove Hole) del Cabezo Gordo de Dolores de Pacheco**, in the Spanish province of Murcia. An important objective is to compare and contrast how Neanderthal folk and their *H. heidelbergensis* forebears used natural resources near to the sites, which are in very different local environments. The results will be of importance in developing research into fossil man of the ice age in Mediterranean Spain. Fieldwork since the early 1990's has very significantly increased the numbers of Pleistocene hominin remains, as well as the Middle Palaeolithic stone tools and Middle-early Late Pleistocene faunal remains, and the earliest remains of a fire from a Palaeolithic site in Europe. The results are greatly helping to extend our knowledge about *H. heidelbergensis* and *H. neanderthalensis*, their origins and their lifeways.

# We're all in it together!

## We're VERY down to earth in every sense of the words...!



### MESSAGE TO ENQUIRING PROSPECTIVE FIELD SCHOOL HELPERS

Michael J. Walker

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January tenth, 2018

**Dear Enquirer,**

I want to welcome you to take part in our Field School which celebrates its 29<sup>th</sup> Field Season in 2018. I'm sure you'll have an interesting time, especially if you're interested in human evolution and our hominin ancestors. It is not too late to sign up. **There is no application form: just send an email to [mjwalke@gmail.com](mailto:mjwalke@gmail.com) and you MUST attach a 1-page (brief) c.v. which MUST include (1) your full name, (2) date of birth, (3) nationality and passport number, (4) permanent home address, (5) address for correspondence, (6) contact phone number(s) and email address(es). If that information is not sent, you probably will not get a reply from us.**

You may very well be as lucky as some recent participants who have helped to excavate hominin bones and teeth during the course of their stay with us: in 2017 part of a Neanderthal mandible and in 2016 two Neanderthal teeth were excavated by our helpers in a deep layer at Sima de las Palomas dating from 130,000-100,000 years ago. Higher layers had provided Neanderthal bones, still in their original state of anatomical articulation, of the chest, shoulder girdle and upper limb, and of the pelvic girdle, leg and foot, which belong to three individuals, perhaps crushed by a rock-fall or maybe intentionally arranged and covered with rocks, which we uncovered at Sima de las Palomas in 2004-2010 and which date to between 55,000 and 50,000 years ago. For many of our helpers it was the most exciting thing they had ever done. Several of them, when they arrived, knew very little about human evolution, or even how we excavate at prehistoric sites, and went away thrilled and having picked up a great deal of both knowledge, not to mention Neanderthal human remains! There is also great excitement at Cueva Negra which lately has been recognized as a very much older site than we had thought it was. In its sedimentary fill we have recovered numerous teeth of fossil rodent species known from several sites in Spain after 1,000,000 years ago that became completely extinct long before 700,000 years ago. We have also excavated an "Acheulian" hand-axe associated with flakes struck by the so-called "Levallois" technique, and stone tools with abrupt "Mousterian"-like retouch. Palaeomagnetic research undertaken by the Berkeley Geochronology Center shows that the sedimentary fill is older than 780,000 years ago. Palaeontological and palaeopalynological research suggest an age of 800-900,000 years ago. In 2011 we began to find calcined animal bones and burnt chert 4.5 metres deep down in the sediment, which give us the oldest evidence for fire in Europe found to date (in Africa there is evidence from before 1,000,000 years ago); the 2012, 2013, 2014, 2015, 2016 and 2017 field seasons have found more evidence still of this astounding discovery.

If you go to <http://www.mupantquat.com> you will find, and should open, study, and save, this long document entitled **BRIEFING YOU** which tells you how the Project got started and where we're at right now. As you'll see, since the Project began in the early 1990's we have found a large number of remains of hominin and animal bones, and the stone tools of Pleistocene hominins. I hope this updated version of **BRIEFING YOU** will be on our mupantquat web-site during January 2018 (until then 2017 version will be left on it and the information, except for the dates, is fundamentally what the 2018 version will include).

The Project is carrying out excavations at two sites in Murcia province, S.E. Spain which date from between 900,000 and 40,000 years ago, and are called:

Cueva Negra (Black Cave) del Estrecho del Río Quípar de La Encarnación, and  
Sima de las Palomas (Dove Hole) del Cabezo Gordo de Dolores de Pacheco.

The dates when we shall be at each site are as follows:

SESSION 1: June 29<sup>th</sup> (Fri.) – July 20<sup>th</sup> (Fri.) 2018 at *Cueva Negra del Estrecho del Rio Quípar*

SESSION 2: July 20<sup>th</sup> (Fri.) – August 10<sup>th</sup> (Fri.) 2018 at *Sima de las Palomas del Cabezo Gordo*.

We start and finish on Fridays because from London there are both *Ryanair* flights (from Luton and Stansted) and *Easyjet* (from Gatwick) on weekdays – as well as many other low budget flights by other airlines (see *FIELD LOGISTICS*), and also connecting *Iberia-Air Nostrum* flights from Madrid and Barcelona on weekdays - but often not at weekends - for intercontinental travellers arriving in Spain (e.g. from U.S.A.).

I think the best thing you can do now is to read *BRIEFING YOU* very carefully, and then make up your mind. If you have any queries, please don't hesitate to write to me.

**Very important!** If you are coming, please send me, as soon as you can, details about your route, place, date, and time of arrival so that we know you are definitely arriving so as to put you on our list of people to be picked up at Murcia-San Javier Airport (or at Calasparra railway station for Cueva Negra) – or else so that we know you are NOT going to be picked up by us if you are coming under your own steam or on other days. This is very important for you and for me!

I look forward to seeing you in Spain in the Summer of 2018,

Yours truly

*Michael J. Walker*

## **ENQUIRERS MUST READ THIS IMPORTANT INFORMATION ABOUT THE LIMITS TO OUR RESPONSIBILITY TOWARDS OUR HELPERS**

The policy of MUPANTQUAT with regard to responsibility towards its members is indicated in our registered Statutes of Association. The following comments are relevant to a particular activity of MUPANTQUAT which is the 29<sup>th</sup> edition of its Field School for Quaternary Palaeoanthropology and Prehistory of Murcia and associated archaeological excavations (June 29<sup>th</sup>-July 20<sup>th</sup> 2018, Session 1) at Cueva Negra del Estrecho del Río Quípar near Caravaca, Murcia, and (July 20<sup>th</sup>-August 10<sup>th</sup> 2018, Session 2) at Sima de las Palomas del Cabezo Gordo near Torre Pacheco, Murcia.

MUPANTQUAT extends invitations to selected applicants so that they may participate in the field school and help at the excavations of one or both sessions. Selected applicants are offered membership for the current year of MUPANTQUAT provided that their annual subscription is paid within that year. Their contribution to the self-funding MUPANTQUAT field school and excavations for the year of their participation involves placing a deposit with MUPANTQUAT in order to reserve a place in the team, which includes their subscription as full members (20 euros) or student/non-voting members (10 euros). In the case of first-time helpers from outside Spain the contribution of a new member of MUPANTQUAT in 2018 is 1050 euros for one session or 1890 euros for two sessions, and in either case a deposit of 750 euros per session is required for a place to be reserved.

Until the deposit has been received MUPANTQUAT has no responsibility to invited applicants because its responsibility commences only after their admittance as members of the Association, which, in turn, depends on their having completed the fulfillment of membership requirements. Once the deposit has been received, an applicant thereby has fulfilled the basic requirement, and then and only then does MUPANTQUAT have responsibilities towards its new member, which are the same as to any other member (see Statutes of Association on <http://mupantquat.com> or available on request).

Over twenty-nine years our successful annual field school and associated excavations have received participants from most Member States of the European Union, and several countries further afield, including Russia, China, Indonesia, Ceylon, Australia, Argentina, Mexico, USA, Canada, Norway, northern Cyprus, Kazakhstan, Vietnam, Greece, Czech Republic, Croatia, etc.. The Spanish consular services in those countries have never requested a document about our responsibility towards an applicant who has received an invitation to participate.

To sum up, MUPANTQUAT can send you a letter of invitation to help at our excavations by attending our Field School and thereby become a member of our MUPANTQUAT Association. However, the statutes of the Association preclude it from being more responsible for you than it is for any other member, which means MUPANTQUAT cannot sponsor you; therefore you must arrange yourself whatever requirements the Spanish consular authorities in your country require of you in order to visit Spain. MUPANTQUAT's letter of invitation usually favours applications for a Visitor's Visa, especially if you have already made your financial contribution to MUPANTQUAT and are able to accompany your application with a letter of its receipt from MUPANTQUAT though this will not be a letter of formal legal sponsorship, which would imply MUPANTQUAT's acknowledgement of official responsibility before the Spanish authorities here for all your behaviour and activities after your arrival in Spain, therefore our Association cannot sponsor you. We have had helpers from many countries, including Indonesia, Kazakhstan, China and Vietnam, in none of which have the Spanish consular services rejected applications from helpers who presented our letter of invitation.

# OUR FIELD TEAM AT WORK...



# Field School for Quaternary Palaeoanthropology and Prehistory of Murcia, S.E. Spain

## 29<sup>th</sup> Field Season 2018



Cueva Negra hand-axe

June 29<sup>th</sup> – July 20<sup>th</sup> 2018 at Cueva Negra del Estrecho del Río Quípar (Session 1),  
July 20<sup>th</sup> – August 10<sup>th</sup> 2018 at Sima de las Palomas del Cabezo Gordo (Session 2)

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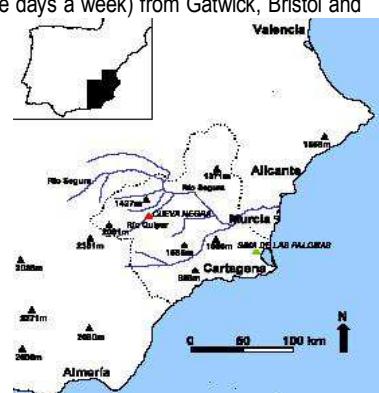
Sima de las Palomas Neanderthal child skull

Excavation has been ongoing for 29 years at these two sites. Cueva Negra has definite signs of fire, a final Early (i.e. Lower) Pleistocene fauna and Acheulian and Levalloiso-Mousterian Palaeolithic artifacts in a sedimentary deposit from a time somewhere between 780,000 and 990,000 years ago according to both biostratigraphy and now palaeomagnetism. Sima de las Palomas has >300 skeletal parts (teeth, bones) of 11 Neanderthal individuals, including 3 articulated skeletons one of which is 85% complete from between 55,000 and 50,000 years ago, an early Late (i.e. Upper) Pleistocene fauna, and Mousterian Palaeolithic artifacts, dated by <sup>14</sup>C, U-series, OSL and ESR, with new finds of Neanderthals and Mousterian artifacts in deep layers dated to 130,000-100,000 years ago.

Helpers are invited for the 2018 summer field season. All applications are considered sympathetically. You need not have archaeological experience. To apply, just send an email with brief cv after going to our MUPANTQUAT web-page, clicking there on FIELD SCHOOL and then on "BRIEFING YOU" (there's no application form to fill in as we keep paperwork to a minimum). The Murcian Association for the Study of Palaeoanthropology and the Quaternary (MUPANTQUAT) coordinates the Field School and excavations and issues your Certificate of Attendance (we also sign any required forms you bring from your university).

While at Cueva Negra we stay at the residential Ascruz school (which has its own kitchen staff) at Caravaca de la Cruz. While at Sima de las Palomas we put bunks in the school in Dolores de Pacheco and take our meals in the restaurant of the village civic centre. At both places, you must bring sheets, pillow-slip, towel, soap and shower-gel. Summer is hot in Murcia: you'll get a chance to swim. Bring light work clothes and flat-soled light footwear for Cueva Negra but bring work boots for Sima de las Palomas. Bring sun-hats, sun-glasses, sun-cream, swimmers. If you've a driver's licence, bring it and help us with driving.

Ryanair flies daily to Murcia-San Javier Airport from London (Luton and Stansted). Easyjet flies (maybe only some days a week) from Gatwick, Bristol and Newcastle. Other budget airlines also fly here from the UK and other European countries. A new Murcia Airport has been built but is not yet open, though if flights land there in 2018 you will be met there, so don't worry. Provided we have their flight details in advance we ferry our helpers (free of charge) between Murcia Airport and our field headquarters who arrive on Friday June 29<sup>th</sup> or who arrive or depart on Friday July 20<sup>th</sup>, or leave on Friday August 10<sup>th</sup>. Caravaca is 100 km from the airport, but Dolores de Pacheco is only 6 km from it. We run from Fridays to Fridays as we often have USA helpers flying into Madrid who need to get connecting weekday flights to Murcia (because weekend flights to Murcia often are cancelled without notice). Travellers by train on June 29<sup>th</sup> or July 20<sup>th</sup> can probably be also met by us. For Cueva Negra, train-travellers should arrive at Calasparra railway station (Madrid-Cartagena line) on June 29<sup>th</sup> and leave on July 20<sup>th</sup>. For Sima de las Palomas, train travellers should arrive at Balsicas-Mar Menor railway station (Madrid-Cartagena or Barcelona-Cartagena lines) on July 20<sup>th</sup> and leave on August 10<sup>th</sup>. Other travellers must make their own arrangements to get to our headquarters at Caravaca or Dolores de Pacheco. We do not meet people at Alicante International Airport, whence travellers can take a "Costa Cálida" bus to Murcia, and then buses from Murcia bus station, either to Caravaca (for Cueva Negra), or to San Javier or Los Alcázares which are 5 km from Dolores de Pacheco (for Sima de las Palomas).

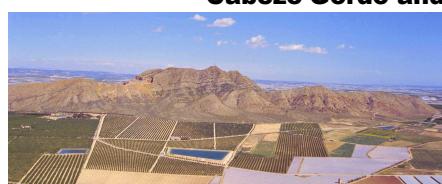


Daily routine: we rise at 7 a.m. and after a light breakfast we excavate from 8 a.m. till 2 p.m. with a mid-morning sandwich. A cooked lunch at 3 p.m. is followed by a nap. We sort finds from 5 p.m. till 9 p.m. when we have a hot dinner. In each 3-week period, there are talks and seminars about our work and human evolution, and we also visit local places of interest. The programme is thus based on a 3-week Session (if you stay for a shorter time you'll miss part of the programme). The normal contribution from helpers staying for a full Session corresponds to €50 euros (€50) a day; covering instruction, board, lodging, and local transportation, or €45 a day when both full sessions are attended (first-time participants staying for less than one full session should contribute €60 a day). To guarantee a place you must send a non-returnable deposit, preferably by May 1st 2018, of €250 (euros) per each 7 days of intended stay. You pay the balance on arrival. You must arrange your own health and personal accident insurance cover beforehand, holiday/travel insurance if desired, and sign an indemnity form on arrival. EU residents should bring the EU card from their country entitling them to public health care in other EU Member States.

### Cueva Negra del Estrecho del Río Quípar



### Cabezo Gordo and Sima de las Palomas



**Field School for Quaternary Palaeoanthropology and Prehistory of Murcia, S.E. Spain.**  
**BASIC INFORMATION**

Organization:: Murcian Association for the Study of Palaeoanthropology and the Quaternary, MUPANTQUAT

Session 1: Fri June 29 – Fri July 20, 2018, at Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, Spain).

Session 2: Fri July 20 – Fri August 10, 2018, at Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain).

Contact: Professor Michael J. Walker, Department of Zoology & Physical Anthropology, Biology Faculty, Murcia University, 30100 Murcia, Spain.

Emails [mjwalke@gmail.com](mailto:mjwalke@gmail.com); [info@mupantquat.com](mailto:info@mupantquat.com)

Further information : <http://www.mupantquat.com>

Description	Excavation and instruction at Pleistocene Palaeolithic sites with hominid remains: Cueva Negra: late-Early-to-early-Middle Pleistocene transition about 800,000 years ago; signs of fire; Acheulo-Levalloiso-Mousteroid Palaeolithic implements; Sima de las Palomas: early Late (i.e. Upper) Pleistocene about fifty-thousand years ago, with abundant Homo neanderthalensis skeletal remains and Mousterian palaeolithic implements.
Periods	Session 1, June 29 – July 20, 2018; Session 2, July 20 – August 10, 2018.
Country	Spain
Locality	Session 1: Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, Spain); Session 2: Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)
Travel	Participants will be picked up by our staff at Murcia-San Javier Airport in the late afternoons of June 29 and July 20 to be driven to our bases, and driven back to it in the early afternoons of July 20 and August 10. Participants wishing to make alternative travel arrangements should consult us beforehand, but it mayn't be possible to meet you so you may have to make your own way to our bases.
Duration	Two three-week sessions. In order to get the most out of their stay we strongly recommend participants to stay for one full session at least.
Age	Minimum 18 years
Qualifications	Previous experience is not essential though preference is given to undergraduates and graduates in appropriate subject areas.
Work	All participants take part in excavation and cleaning and sorting finds, and will receive both practical instruction and talks about our research and about human evolution and Palaeolithic archaeology in the Pleistocene.
Language	English (any knowledge of Spanish is also useful).
Accom.	Bunks in schools with showers etc. Light breakfast, mid-morning sandwich, cooked lunch, cooked evening meal. Vegetarian, halal or kosher menus are NOT available. Bring your own sheets and towel.
Contribution	<b>FOR A COMPLETE SESSION:</b> 50 euros per day includes bed, meals, instruction, local travel from airport and back, daily travel from our base to site and back, official excursions. You must pay your own air fares to Murcia-San Javier Airport and personal expenses. <b>FOR TWO COMPLETE SESSIONS:</b> 45 euros per day. <b>FOR LESS THAN 21 days:</b> 60 euros per day. <b>Former helpers who return:</b> 45 euros per day.
Application	<b><u>There is no application form: just send an email to <a href="mailto:mjwalke@gmail.com">mjwalke@gmail.com</a> and you MUST attach a 1-page (brief) c.v. which MUST include (1) your full name, (2) date of birth, (3) nationality and passport number, (4) permanent home address, (5) address for correspondence, (6) contact phone number(s) and email address(es).</u></b> If that information is not sent, you probably will not get a reply from us. Visit our web-site <a href="http://mupantquat.com">http://mupantquat.com</a> , save or print out a long download called <i>Briefing You</i> and read it carefully. A non-returnable deposit in advance is required of 250 euros per 7 days of intended stay, with balance payable on arrival. Preference is given to applicants wishing to stay for a full 3-week session whose deposits are received before May 1 <sup>st</sup> 2018.
Notes	Each session includes one full-day excursion to other nearby sites of archaeological interest. We issue attendance certificates with number of hours of practical experience and instruction. Although US college credit is NOT available from us, undergrad US college students often can arrange beforehand with their faculty professors to gain credit for participation by presenting papers about it after their return home and we are willing to assist in orientating them during their period on site. We regard all of you as <i>field helpers</i> and in 2018 your contribution will include automatic 2018 membership of MUPANTQUAT. We appeared in the PBS-NOVA television documentary "Decoding Neandertals" that was shown in January 2013 in the USA: to see Sima de las Palomas and our Neanderthal woman Paloma go to <a href="http://www.youtube.com/watch?v=3nH1fqd0Ryo">http://www.youtube.com/watch?v=3nH1fqd0Ryo</a>



**Cueva Negra at 0.8 Ma**

**HIGHLIGHTS OF 2017, MUPANTQUAT ACTIVITIES, SCIENTIFIC MEETINGS, VISITORS,  
FIELD SCHOOL AND RESEARCH PROSPECTS FOR 2018 AT  
CUEVA NEGRA DEL ESTRECHO DEL RÍO QUÍPAR AND SIMA DE LAS PALOMAS DEL CABEZO GORDO**

Michael J. Walker

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January tenth, 2018

**To our English-speaking Mupantquat Members, Field-Team Helpers, Colleagues, and Supporters:**

**Dear Friends All,**

Together with my co-directors of excavation Mariano López and María Haber, and our young graduate staff Antonio López, Ignacio Martín, Jon Ortega, Azucena Avilés, Ángel Buitrago, Consuelo Caravaca, Norman Fernández, Hugo Cano and Gonzalo Linares, I write thanking you for your past help, interest and support, and to inform any who have never been here about what we are doing. Our helpers contribute to our success. Our **mupantquat** web-site is being brought up to date and with luck our annual **BRIEFING YOU** informative document about our forthcoming 2018 field season appear on the web-site during January 2018. Meanwhile, I am sending you an advance Briefing with basic information that you may wish to pass on to others, and also some information to keep you up to date on our work and the excellent prospects for the 29<sup>th</sup> season of our excavations and Field School in 2018. A lot of basic information will undergo little change from that which was in the 2017 version of **BRIEFING YOU** and which will be kept on our web-site until the 2018 edition supplants it. Please note that the dates for 2018 will be as follows: Cueva Negra Friday June 29<sup>th</sup> to Friday July 20<sup>th</sup>, and Sima de las Palomas Friday July 20<sup>th</sup> to Friday August 10<sup>th</sup>, 2018.

As some of you know, in June 2012, at the Murcia regional government official Registry, we registered (incorporated) our non-profit *Murcian Association for the Study of Palaeoanthropology and the Quaternary or MUPANTQUAT (Asociación Murciana para el Estudio de la Paleoantropología y del Cuaternario)* which is extending our work and responsible for organizing our annual Field School and excavations (MUPANTQUAT email <mupantquat@gmail.com> <info@mupantquat.com> and web-site <<http://www.mupantquat.com>> .

MUPANTQUAT has coordinated the English and Spanish editions of a well-illustrated semi-popular book about more than two decades of our excavations at Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar. There have been delays in getting the manuscripts and illustrations together, largely owing to pressure of work and pressing administrative matters that have distracted us. The English text is with the well-known publisher of archaeological books at Oxford which is Oxbow Books, whose editor is preparing it so that it can go to press in 2018; we have proposed a self-explanatory title: "HOW THE EARLIEST CAVE-FOLK OF SOUTH-EAST SPAIN WERE DUG UP" but the publisher wants us to change it (any ideas?). Our MUPANTQUAT association itself is publishing the Spanish edition with a printer here at Murcia where it will be given free-of-charge to paid-up members, specified donors and institutions (publication costs are being shared by us and some other organizations). Being a non-profit organization we cannot sell the Spanish edition but we can give it away and have decided to do so to all paid-up members. Former field-team members whose contribution towards the excavation and field school has included MUPANTQUAT membership for the year they came may renew their membership and entitled to receive a copy of the Spanish edition. Because Oxbow Books is a commercial enterprise the English edition will not be available free of charge to MUPANTQUAT members, alas, and any who are interested will have to purchase it from Oxbow Books. We hope to increase our membership in Spain by offering the book as a gift to new members.

A scholarly monograph about the Neanderthals we have excavated at Sima de las Palomas was published in 2017: *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain* (E.Trinkaus & M.J.Walker, Eds., Texas A&M University Press, College Station, Texas, ISBN 9781623494803). Its preparation involved revising the draft manuscripts of chapters by several authors, and preparing many illustrations, figures and tables, checking, correcting and returning final proofs, a lot of work was required which all took up time. The book went to press at the end of 2016 and went on sale in 2017 as a hard-back book with several colour plates.

On September 30<sup>th</sup> and October 1<sup>st</sup> 2017 MUPANTQUAT organized an extremely well-attended seminar of 8 public lectures in the splendid *Real Casino* in the centre of Murcia that has a lecture theatre that holds over 100 people (and was always full!). The seminar was opened by the distinguished palaeontologist, and pioneer of the hominid research at Atapuerca, Dr. Emilio Aguirre Enriquez, who turned 93 a few days after our meeting. It was an honour for us to receive him and his wife and we have made him an Honorary Member of MUPANTQUAT. The theme of the meeting was "*The Evolution of the Human Brain and Cognitive Archaeology*" ("Evolución del Cerebro Humano y la Arqueología Cognitiva"). Four lectures were given by guest speakers Drs. Miguel Caparrós (Musée de l'Homme, Paris), Antoni Gomila (University of the Balearic Islands), Héctor Manrique (University of Saragossa) and Blanca Samaniego (National Archaeological Museum at Madrid). Four lectures were given by Murcia University Drs. Trinidad Herrero, María Haber, Ignacio Martín and myself, Michael Walker. The seminar was made possible thanks to financial support from our local savings bank's foundation (Fundación CajaMurcia) and two businesses (Sakata España, S.L. and Incogás). Preparation is underway for publication of the proceedings in Spanish.

In October 2015 we hosted a 3-day series of guest lectures on Human Evolution that our local savings bank's Fundación Caja-Murcia sponsored at its 300-seat lecture theatre in the city centre which had an astonishing attendance with people having to sit in the aisles! Our speakers were the palaeoneurologist Dr. Emiliano Bruner (of CNIEH at Burgos), the prehistorian Professor José Ramos (of Cadiz University) who excavates on both sides of the Gibraltar Strait at Palaeolithic sites, and the editor, author, and documentary film-maker about archaeology and human evolution, Manuel Pimentel, whose "Arqueomanía" team has produced several series for Spanish national television and filmed us on several occasions, so we presented him with a certificate designating "Arqueomanía" an Honorary Member of our association (this was at his request after we had proposed conferring honorary membership on him). Unfortunately, at the end of 2016 the Espacio Pático closed, which caused a hiatus in our programming because we had to find another venue for our association meetings and talks to our members, which began to be held at another city-centre restaurant and bar with a pleasant well-appointed basement meeting-room-cum-art-gallery, called Vox Populi, but unfortunately that also changed management during 2017 which has interrupted our programming once more! Fortunately we made up for that by holding the public seminar on "*The Evolution of the Human Brain and Cognitive Archaeology*" in the elegant nineteenth-century *Real Casino* in Murcia's historic city centre. We have also run a number of local meetings and excursions to our sites for interested members of the public. I also gave the following talks in 2017: on June 17, "Nuevas perspectivas sobre la Paleoantropología en la Región de Murcia: La Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz) y la Sima de las Palomas del Cabezo Gordo (Torre Pacheco)," in a seminar series entitled *Nuevas Perspectivas del Paleolítico del Sudeste Peninsular*, held at Cartagena and Torre Pacheco from June 16-18 2017, organized by the Universidad Nacional de Educación a Distancia (Spain's public Open University) and the city councils of Cartagena and Torre Pacheco; and other lectures and excursions were given by Committee members of MUPANTQUAT, namely Dr. María Haber, Dr. Ignacio Martín, Jon Ortega, Mariano López and Antonio López. Also I gave a talk on March 13 on "Evolución y desarrollo del Cerebro Humano," in a week of invited lectures, the *XIV Conmemoración de la Semana del Cerebro en Murcia 2017*, organized by the Real Academia de Medicina de Murcia (March 13-17, 2017).

A Murcia regional government foundation (Fundación Integra) made an animated film about, and called simply, "Cueva Negra"; our association and the foundation took it around our region for showings in different towns and cities, and after the showing there was a scientific colloquium in which we took part by giving brief talks and answering questions from the audience. We appeared in the PBS-NOVA television documentary "*Decoding Neandertals*" that was shown in January 2013 in the USA. From 2012 to the present our MUPANTQUAT Association has organized talks and excursions in Murcia city and other towns in the Murcian Region, and has held three joint meetings with the Murcia Regional Geographical Society and other associations in the region-

Our 2017 field team brought together helpers from Australia, USA, UK, Portugal, and Spain. It was splendid to welcome back Stephen Barlin from England and Charles LeMoine from Australia. Stephen gave us a talk about the research he undertook for his master's thesis at University College London. Charles is about to undertake a Ph.D. at Queensland. An excellent team spirit was established and everyone participated wholeheartedly on site, in the lab, during seminars and talks, on excursions, and, of course, in extracurricular activities! It was particularly helpful that two of our helpers were able to spend the full six weeks with us, namely Stephen Barlin and Tori Bianchi from the USA. There is still an enormous amount of excavation awaiting us in 2018, and for many years to come! Both sites are very productive. Prospects for 2018 are excellent at both Cueva Negra and Sima de las Palomas. Tell your friends! Pass around the invitation to enquirers that follows this letter, please. We need recruits! A lot is happening!

At Cueva Negra excavation continued both in the deep layers which have provided the earliest evidence for fire at any Palaeolithic site outside Africa. Dating is based on, on the one hand, on biochronology of both Arvicolid rodent teeth studied by our MUPANTQUAT Treasurer, biologist Antonio López Jiménez (an article on the Arvicolid dating has been

submitted for publication in the scientific journal *Historical Biology*), and also large mammal remains studied by our friend and collaborator, the palaeontologist Dr. Jan van der Made (at Madrid's National Museum of Natural Sciences), and, on the other hand, on palaeomagnetism (published in *Nature* 46, pp.: 82-85, by Professor Gary Scott and Dr. Lluis Gibert, in 2009). These methods imply an antiquity greater than 780,000 and less than 990,000 years ago; we think it likely that the sediments in the cave were laid down between 865,000 and 815,000 years ago during an interglacial period that corresponded to Marine Isotope Stage MIS-21.

At Sima de las Palomas a most important find was made in 2017 of part of a Neanderthal mandible in the deep layers, now dated to between 130,000 and 100,000 years ago, in which two Neanderthal teeth had been excavated in 2016; field-work is continuing downwards in the excavation, such that we are now working about 5 m below the overhanging rock roof. We are still finding a large amount of material, mainly Mousterian Palaeolithic implements and animal bones and teeth, many of which show signs of burning. We are surprised at the depth at which material continues to be found, and we wonder if this deep assemblage represents rubbish thrown or dropped from a vanished surface camp-site, but that is guesswork; maybe there was another entrance that mining destroyed – perhaps further excavation will clarify the matter. The deep layers have provided a large quantity of burnt animal bones and several Middle Palaeolithic artifacts. Preliminary OSL (optical sediment luminescence) estimates on sediment samples from the deep layer analyzed by Oxford University's Dr. Jean-Luc Schwenninger imply an age corresponding to MIS-5 of 130,000-100,000 years ago (MIS = marine isotope stage); the samples were taken by his graduate student Mariana Sontag-Gonzalez who spent two weeks with us during our 2015 field season; she is now doing a PhD at Wollongong University in Australia. Estimates on a hard conglomerate layer that seals the deep bed have been obtained of 68,000-65,000 years ago by Reading University's Dr. Stuart Black who undertook ESR/U-ser (electron spin resonance/uranium-series) analyses on the conglomerate. In September 2017 Dr. Schwenninger's and Dr. Black's dates were presented at the 7<sup>th</sup> Annual Meeting at Leiden in Holland of the European Society for the Study of Human Evolution. (M.J.Walker, M.Sontag-González, M.Haber Uriarte, M.López-Martínez, S.Black, J.-L. Schwenninger, "Preliminary dating of deep layers at Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)," 7<sup>th</sup> Annual Meeting of the European Society for the Study of Human Evolution (ESHE), held at Leiden in The Netherlands, 21-23 September 2017, and *Proceedings of the European Society for the Study of Human Evolution 6, PESHE 6*, p. 210). You will find the poster here in *BRIEFING YOU*.

At Sima de las Palomas between 2004 and 2010 we uncovered articulated skeletal remains in anatomical connexion of two Neanderthal adults together with a child, covered by rocks in the cave 55-50,000 years ago and lying above the hard 68,000-65,000 year old hard conglomerate band that seals the deep layers. Previously, the last articulated adult Neanderthal to be excavated was way back in 1976, at St.Césaire in France. These are the subject of the scientific monograph which is *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain* (E.Trinkaus & M.J.Walker, Eds., Texas A&M University Press, College Station, Texas, ISBN 9781623494803). Jon Ortega, Azucena Avilés and Ángel Buitrago are doing brilliant work in the new lab (that we now have at Torre Pacheco, thanks to the kindness of its town council) cleaning and identifying the bones in the cemented breccia masses we have excavated. In 2011 we acquired vibroscalpels (so-called "air-scribe" tools) powered by a small compressor to facilitate the cleaning. We have used Murcia University Veterinary Hospital's CAT scanner to visualize human bone remains in the breccia masses and to record the digitalized images for analysis and virtual reconstruction, and we are grateful to Professors Christoph Zollikofer and Marcia Ponce de León who came over from Zürich University in 2011 to show us how they carry out CAT scanning of fossil remains and they most kindly invited Jon and me to visit their Zürich laboratories in 2011. In Autumn 2012 Jon spent several weeks at Zurich "boning up", so to speak, on their IT methodology. They returned to Murcia in September 2015 and further CAT scanning was undertaken at the Murcia Quirón Hospital this time. In November 2015 we welcomed back, to help Jon, Klára Karaková (née Parmová) from Brno in the Czech Republic who has worked with us on several occasions in the field and laboratory.

Thanks to the generosity of Torre Pacheco town council, with which we have signed an agreement of collaboration, in 2017 we have begun work in our new laboratory that in 2016 was assigned for Sima de las Palomas research in a spanking new building that houses the municipal police department, a library facility for high-school students, and a large meeting room. In December 2016 the mayor and town council inducted me as its Adopted Son in a public meeting! Not to be out-done, the mayor of Caravaca town council, with which we also have signed an agreement of collaboration, unveiled a plaque giving my name to a street in La Encarnación which is beside Cueva Negra. The big elephant in the room, alas, is the white elephant of the unfinished *Regional Museum for Palaeontology and Human Evolution* below Sima de las Palomas, which is still waiting for funds to fit out the enormous empty concrete shell. It is meant to house our spectacular Neanderthal skeletons (in September 2010 the then Chairman of our Regional Government in Murcia laid its foundation stone). I visited the concrete structure early in January 2013 with the architect, but, alas, it still stands empty and now needs fitting out; work on the interior was scheduled to begin in 2014 but has been postponed to at least 2018, owing to continuing economic difficulties in Spain which have severely restricted public spending, which is most frustrating. I am engaged in conversations with the regional government politicians in the hope that work may recommence soon. Matters have not been helped by Spain being without an effective government throughout 2017, and by regional and municipal political instability, though the new Torre Pacheco town council is working well with us.

Publication and presentation of our research continues. Two posters were presented at the 7<sup>th</sup> Annual Meeting of the European Society for the Study of Human Evolution held at Leiden in The Netherlands, from 21-23 September 2017. One mentioned earlier, dealt with new dating of the deep part of Sima de las Palomas. The other was by G.Linares-Matás, J.Yravedra, I.Martín-Lerma, J.Aramendi, L.Courtenay, M.A.Maté-González, M.Haber-Uriarte, M.López-Martínez, M.J.Walker: "Preliminary taphonomical assessment of the macromammalian zooarchaeological assemblage at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, Spain)," *Proceedings of the European Society for the Study of Human Evolution 6 (PESHE 6)* p. 117. The year before, two posters involving research at Sima de las Palomas were presented at the 6<sup>th</sup> Annual Meeting of the European Society for the Study of Human Evolution held at Alcalá de Henares (Madrid), concerning dental development of Neanderthal teeth (work done largely by Drs Kate Robson-Brown and Priscilla Bayle: you will find the poster in *BRIEFING YOU* above), and studies on phytoliths in dental plaque that indicate Neanderthals ate plant foods (work done in collaboration with us by Dr Amanda Henry and her research colleagues Drs. Domingo García-Salazar, Robert Power and Cynthia Spiteri at Leipzig's Max-Planck Institute for Evolutionary Anthropology – a paper has been submitted for publication to the *Journal of Human Evolution* (R.C.Power, D.C.Salazar-García, D.C., M.Rubini, A.Darlas, K.Harvati, M.Walker, J.-J.Hublin, A.G.Henry, "Dental calculus indicates widespread plant use within the stable Neanderthal dietary niche").

In September 2012 I presented a poster on behalf of us all about this research on the Sima de las Palomas Neanderthals at the 2<sup>nd</sup> Annual Meeting at Bordeaux of the then recently-formed European Society for the Study of Human Evolution, which attracted great interest, and the poster was shown again in April 2013 accompanying a talk about the Sima de las Palomas Neanderthals that I was invited to give at the 55<sup>th</sup> Annual Meeting of the international Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age, held at Vienna's grand Natural History Museum. In 2013 an important paper was published demonstrating that the Sima de las Palomas Neanderthals ate plant foods because microscopical phytoliths were found embedded in plaque on their teeth (Salazar-García et al., *Quaternary International* 318: 3-18, 2013) and, as mentioned in the previous paragraph, we are grateful for the help from Dr. Amanda Henry and her colleagues for this important research involving Sima de las Palomas. In September 2014, in the session on Neanderthals during the week-long XVII quinquennial Congress of the International Union of Prehistoric Sciences that was held at Burgos University, I presented a new poster explaining the likely *intentional* nature of the burial of the three articulated Sima de las Palomas skeletons, and I presented the poster again in April 2015 both at the 57<sup>th</sup> Annual Meeting of the Obermaier Society held at Heidenheim in Germany, and also at Oxford's Merton College which hosted the 5<sup>th</sup> Annual Meeting of the itinerant "Unravelling the Palaeolithic" symposia.. Our reasons were outlined in a major article about the excavations (see *Quaternary International*, 259; 7-21, 2012). To help us study the skeletons, in January 2011 the eminent Anthropology Professor Erik Trinkaus came over here from Washington University at St.Louis. Thanks to his invaluable collaboration we published two papers on Sima de las Palomas Neanderthal remains in the *Proceedings of the National Academy of Sciences of the USA* (105: 20631-6, 2008; 108: 10087-91, 2011), two in the *American Journal of Physical Anthropology* (142: 261-272, 2010; 144: 505-515, 2011) and one in the *Journal of Dental Research* (90: 428-432, 2011; Erik and I have edited the scholarly monograph mentioned above in which co-authors of some chapters include Bristol University's Professor Kate Robson-Brown who came with Bordeaux University's Dr. Priscilla Bayle (another co-author) bringing to Murcia the Bristol microtomograph for CAT scanning of the Sima de las Palomas teeth and jaws in 2012. Kate arranged for me to be Bristol University Benjamin Meakin Visiting Professor in 2014 when I gave lectures there about Sima de las Palomas, and it provided me with the opportunity also to give talks about Simas de las Palomas and Cueva Negra in June 2014 at the universities of Reading, York, Oxford and University College London. I saw Kate again in September 2015 at the 5<sup>th</sup> Annual Meeting of the European Society for the Study of Human Evolution held that year at the British Museum; we are in close contact by email.

Inside Cueva Negra, at a depth of 4.5 metres down in the sedimentary fill, we uncovered calcined bone and burnt chert during our 2011, 2012, 2013, 2014, 2015, 2016 and 2017 field seasons of excavation in sediment that appears to have been altered by heat. The 2016 field season saw us extend the area affected by combustion which now has been exposed over about 3 m<sup>2</sup>. This is a slow business because of the need to excavate overlying levels and wash all of the sediment over our sieves because all of them produce material of value. Our field team in 2016 was thorough, patient, and professional, and I compliment everyone. I was impressed with the skills and professional and academic preparation that you all came with, at both the Cueva Negra and Sima de las Palomas sessions. The deep layer with evidence of combustion is the oldest instance of fire in Europe found to date at any Palaeolithic site (though in Africa there is evidence from before 1,000,000 years ago). Research on the combustion at the site has continued during the past three years and culminated in June 2016 in the publication in the prestigious Cambridge University Press journal *Antiquity* volume 90 pages 571-589 of the article "Combustion at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Murcia, Spain)" by M.J.Walker, D. Anesin, D.E. Angelucci, A.Aviles-Fernández, F.Berna, A.T.Buitrago-López,Y.Fernández-Jalvo, M.Haber-Uriarte, A.López-Jiménez, M.López-Martínez, I.Martín-Lerma, J.Ortega-Rodríguez, J.L.Polo-Camacho, S.E.Rhodes, D.Richter, T.Rodríguez-Estrella, J.-L.Schwenninger and A.R.

Skinner. In September there was published in the *Journal of Archaeological Science Reports* volume 9, pages 427-436 "Fire in the Early Palaeolithic: evidence of small mammal burning at Cueva Negra del Estrecho del Río Quípar, Murcia, Spain" by S.E. Rhodes, M.J.Walker, A.López-Jiménez, M.López-Martínez, M.Haber-Uriarte, Y.Fernández-Jalvo and M.Chazan. The temperature reached about 550°C according to spectrometry analyses of the burnt bone and chert, which have been undertaken by Dr Anne Skinner (at Boston's Williams College) using electron spin resonance methods, Dr. Daniel Richter using thermoluminescence methods (at the Leipzig Max-Planck Institute for Evolutionary Anthropology and at Lüneberg Leuphana University), and Dr Francesco Berna (at Simon Fraser University) using Fourier-transform infra-red techniques with which he carried out postdoctoral research at Boston University under the guidance of the distinguished geoarchaeologist Professor Paul Goldberg who developed the method there. Dr Berna's friend, geoarchaeologist Dr. Diego Angelucci (at the Italian University of Trento), has studied the micromorphology of thin sections he took at Cueva Negra with his PhD student Daniela Anesin (see *Quaternary Science Reviews*, 80:195-199, 2013). Taphonomical research on small mammal bones involving scanning electron microscopy and energy dispersive X-ray spectrometry by Dr. Yolanda Fernández-Jalvo (at CSIC at Madrid) and Sara Rhodes (undertaking doctoral research at Tübingen University following her M.Sc. at Toronto University when she studied micromammalian remains from Cueva Negra and also porcupine jaws and teeth of *Hystrix javanica* from Sima de las Palomas). Mineral and chemical analyses of the burnt sediment were undertaken by our members Drs. Tomás Rodríguez-Estrada (Cartagena Polytechnic University) and Juan Luis Polo-Camacho (Murcia University) using multiple analytical techniques (thermogravimetry with mass spectrometry, X-ray diffusion, X-ray fluorescence, and petrological microscopy). Traceological microscopy was undertaken by our member Dr. Ignacio Martín-Lerma (Murcia University). Optical sediment luminescence dating was undertaken by Dr. Jean-Luc Schwenninger (Oxford University) and his graduate student Mariana Sontag-Gonzalez who took new samples with γ-ray spectrometry at both sites during our 2015 field season. I presented papers about combustion at Cueva Negra, which excited great interest, at a session on the archaeology of fire at the Burgos XVII IUSPP Congress in September 2014, and two weeks later at the 4th Annual Meeting of the European Society for the Study of Human Evolution at Florence University, and again on October 19th 2015 at the Oxford University Institute of Archaeology, and, more recently, in May 2016 I gave a paper, which was well-received, on May 6th, in the Human Evolution section of the inter-congress held at Dubrovnik (Croatia) of the International Union of Anthropological and Ethnographical Sciences (May 4-9, 2016), and it was good to meet up in Dubrovnik with Daniel Borosa who came from Zagreb to see me - he dug with us at Sima de las Palomas a few years ago.

2017 saw the publication by Palgrave-Macmillan/Springer-Nature of a short book I wrote with psychologist Dr Héctor Manrique of the University of Saragoosa, entitled *Early Evolution of Human Memory: Great Apes, Tool-Making and Cognition* (ISBN 9783319644462, e-book ISBN 9783319644479), in which chapter 4 draws attention to how the stone tools from Cueva Negra are relevant from the standpoint of recognizing the cognitive flexibility of their late Early Pleistocene stone-knappers, and the matter is also mentioned in my short 2017 book *Palaeolithic Pioneers, Behaviour, Abilities, and Activity of Early Homo in European Landscapes around the Western Mediterranean Basin ~1.3-0.05 Ma* (2017, Archaeopress, Oxford; ISBN 9781784916206. e-book ISBN 9781784916213). I drew the attention of the astonishing antiquity of Cueva Negra to anthropology Professor Tom Wynn (at the University of Colorado at Colorado Springs), who is a world authority on what Acheulian and Levallois knapping techniques can tell us about the evolution of cognition in hominins, and he and his colleague psychology Professor Fred Coolidge (also at UCCS) have written well-known books together about cognition in Pleistocene humans and Neanderthals. Two of their then undergraduate students helped in our 2011 excavation season and one of them, Clint Janulis, is now finishing his doctoral research at Oxford University where also MUPANTQUAT student member Gonzalo Linares from Murcia has taken First Class Honours in his BA degree in Archaeology and is about to embark on a master's course. Until now nobody had ever imagined that the Levallois reduction technique in Europe could be as old as we are finding it to be at Cueva Negra, and to have both Acheulian and Levallois techniques at our site is intriguing. Tom, Fred and Sophie de Beaune edited a 2009 Cambridge University Press book on the evolution of human cognition, *Cognitive Archaeology And Human Evolution* which has a chapter by me about the significance of the Cueva Negra lithic assemblage.

I briefly saw Fred at Leiden in 2017, along with many other old friends including Trevor Underwood, Armin Kaiser and his wife Mary, and some former helpers at our excavations, including Mana Dembo, Sara Rhodes and Hendrik Olivier. I understand that Tom Wynn has not enjoyed the best of health lately; I had missed seeing him by a week when I was in Oxford in June 2015 (he had passed through the week before me) but I had the pleasure in 2014 of seeing Fred Coolidge twice in September, first at Burgos and again two weeks later at Florence, and then again in September 2015 at the 5th Annual Meeting of the European Society for the Study of Human Evolution at the British Museum, during which Fred, Clint Janulis, his wife Amanda, and my friends Armin Kaiser and Trevor Underwood (both of whom visited our sites in 2015) and I had a most agreeable dinner at a Greek restaurant, smashed plates and all! I am most grateful for the kind hospitality given to me by Clint and his wife in April, September and again in October 2015; unfortunately I have not had the time to visit Oxford in 2017. It was a pleasure for me when Clint and Amanda came to Murcia in August 2015 and I could show them how the excavations have advanced at both sites as well as some rock art sites near Cueva Negra. We have now published more about the significance of the Cueva Negra and Palaeolithic activities there (see *Human Evolution* 31: 1-67, 2016; *Quaternary International* 294: 135-159, 2013), and are beginning to determine the natural chert sources exploited by the Cueva Negra hominins, thanks to collaboration at Arizona University, where its recent anthropology graduate Winston Zack, who spent three field seasons here, submitted many samples he took, from both the site itself and chert outcrops in its vicinity, to Dr. Alex Andronikov at AU's Lunar and Planetary Sciences Laboratory who has conducted spectroscopic analysis of rare-earth trace elements in the cherts (see *Quartär* 60: 7-28, 2013) which was distributed in January 2014 and three months later I presented results of this research at the 56th Annual Meeting of the Hugo Obermaier Society at Braunschweig-Schöningen in Germany. Clint and Amanda were not the only friends to return in 2015. Australians Dr. Phil Habgood and his wife Dr. Natalie Franklin who have excavated at our sites came back for a rapid visit in August 2015 before going to a conference on rock art (on which Nat wrote her thesis). They live at Brisbane as does Birgitta Stephenson who also has dug with us, and she is collaborating with us on residue analysis on which she is an expert, and she hopes to return soon, and we hope that she will. Our Palaeolithic use-wear specialist, MUPANTQUAT committee member Dr. Ignacio Martín-Lerma (Murcia University lecturer) keeps running into her at international conferences.

In October 2014 I gave a paper on the evolution of cognition in *Homo*, considered from the standpoint of human neurophysiology, at a small international scientific meeting on "What Made Us Human" held in October at the Ettore Majorana Foundation and Centre for Scientific Culture at Erice in Sicily, one of whose organizers was Ian Tattersall. I had previously given a preliminary version at Bristol University four months before. At Erice I had the pleasure of making the acquaintance of Dr. Héctor Manrique whose PhD was on studying gorilla behaviour and cognition when he was a doctoral student at the Leipzig Max-Planck Institute for Evolutionary Anthropology, and in October 2015 he has gained a lectureship at the University of Saragossa's Teruel campus, after having taught at the Balearic Isles University at Palma on Majorca, to which he invited me in November 2014 to give the talk I had given in Sicily. In both 2015 and 2016 he visited us at Sima de las Palomas and gave an interesting talk on his research with gorillas. I gave my talk yet again at the 5th "Unravelling the Palaeolithic" meeting at Oxford in April 2015 (of which Clint Janulis was a co-organizer) and it was published in 2017 in a book, edited by Dr. Francesc Ribot, of papers in memory of the late Dr. José Gibert, published by the Diputación Provincial de Granada, and presented in 2017 at a meeting organized by the mayor of the Granada town of Orce (where a new museum is dedicated to José Gibert) together with his son, Dr. Lluís Gibert, also a geologist (my chapter is "Drawing neuroscience and palaeoanthropology together. Palaeoneurophysiology and cognitive evolution in Early Pleistocene *Homo*: Biological and palaeoanthropological perspectives on the role of "haptic" working memory in the evolution of procedural long-term memory"). In September 2016 I gave three talks in an international summer school workshop on tool-use and cognition in great apes and early humans which Héctor Manrique organized at the Teruel Campus of the University of Saragossa. We had both become quite friendly at Erice with a Sicilian telecommunications engineer who supports the Ettore Majorana Foundation (Majorana was a brilliant physicist who vanished mysteriously), and who by coincidence works in the same branch (Telecommunications Patent Examination) of the same organization (European Patent Office) as my eldest son (my son at The Hague; Giuseppe Barroco in Munich), and by yet another coincidence his niece, a child psychologist, was spending a few months at Murcia University with a colleague of mine, so in Spring 2015 Giuseppe came to Murcia to see his niece, and I gave him the grand tour of Cartagena, and he has promised to return! It's a small world! Maybe I'll see him in 2018.

Alas, I cannot enter into correspondence with everyone individually, even when you write to me with specific enquiries about the progress of our research. Hundreds of people have attended our Field School over the past two decades, and because I have no secretary I cannot answer scores of letters separately. So that is why I am sending you this round-robin letter. One size will just have to fit all, I am sorry to have to say. The snippets offered below will have to suffice, together with what will be put up on the website (especially in "Briefing You"), even if they only serve to whet your appetite for more! You will appreciate, I feel sure, that it is one thing for me to correspond about ongoing unpublished research with the handful of established scientists who collaborate with our project, but it would be an unethical and improper thing for me (or them) to do if we were to enter into correspondence about unpublished new business people who are not directly involved in the scientific development and elaboration of those particular research matters. Their eventual publication must be awaited with your patience - even though it may have to last for a few years. All the same, I do try to go out of my way to answer enquiries from those graduate helpers who are now doctoral candidates at universities around the world, when from time to time they write to me enquiring about highly specific scientific matters concerning their own research which have occurred to them in relation to knowledge they acquired when working at our sites.

Also, when undergraduate students want to come as helpers, and enquire about how to use their experience to gain credit from their own colleges or universities, because we ourselves have no structure for giving them such credit, I do want you to know that if your own college professors are willing to give you college credit for a paper or report you present to them on your return, then I will collaborate with your college professors who write directly to me to ask about appropriate topics for papers or reports you might present to them, and I will offer you advice during your stay here (but not afterwards); you may use photographs you have taken and, indeed, we always encourage you to take photographs provided that you let us have copies for our use. You should inform your faculty that each one of our Field School's three-week sessions involves 180 hours of training, divided into about

ninety of supervised excavation and retrieval of finds both by your own manual excavation and by wet-sieving (wet-screening) of excavated Pleistocene sediment, about seventy hours of supervised preliminary sorting of finds in our field-lab, about ten of talks and seminars and another ten for a visit to places of archaeological relevance and historical interest.

For those universities that require certificates of attendance as requisites for completion of undergrad degrees (especially in Archaeology, in the UK and Commonwealth countries, and a few others), I will sign their forms provided you bring them with you (I won't guarantee to do so if you forget to bring them and try to send them to me afterwards) and I always issue our own Field School certificates of attendance to every helper – whereas some universities only accept their own completed forms (e.g. London), others find ours to be an acceptable substitute should you forget to bring their own forms (e.g. Oxford).

I'm often asked to write in support of helpers who apply for graduate study. It is time-consuming and because I am extremely busy with other paperwork every December and January, I will write such support only provided that I have received the forms I have to fill in for you before October thirty-first, thereby giving me November to fill them in and send them off; usually graduate-study applications have to be in by the following February. Moreover, I will only fill in paper forms which can be returned by airmail (whether to you or the institution you are applying to, depending on its requirements) – whether for graduate-study or any other applications or requests on your behalf. I can fill paper forms in by hand after my university office hours while watching television at home in the evening. I absolutely refuse to do on-line form-filling; please take good note!

I will not help you where an institution gives me no other option than to fill out an "on-line" form. I avoid like the plague having to go "on-line" to institutions and fill in forms "on-line" by computer, for several reasons. First, it can be very slow and take up far too much time in my office hours at the university. Secondly, "on-line" forms are constraining and often do not let me say all those things I might want to say but which I can easily add or annex to a paper form. Thirdly, institutional administrative or secretarial assistants (I have none) ought to be capable of transcribing documents into "IT" documentary formats (though some nowadays seem almost unable to read or write, let alone spell or punctuate with accuracy), but they are not trained either to do anthropological research or to give university lectures to students – both of which comprise what I am paid to do according to my employment contract, whereas I am not contracted to do secretarial work (for which in any case I have never been trained) and I refuse to do it "on-line" so that, at the expense of my working time and labour, some institutions can cut costs by employing fewer administrative or secretarial assistants to work for them than they might otherwise do; there is a fundamental matter involved here involving principles of natural justice, employees' rights and duties, and fair-play by employers in the work-place.

We very rarely get financial help from the public authorities here, alas. We did receive some in 2007 and 2009, but there was none in 2008, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, nor will we see much if any in 2018, owing to economy measures caused by Spain's dire financial crisis. Anyway, much of the money we did receive was earmarked for costly infrastructure, dating, or other analyses at international centres. We rely on our field helpers to keep the fieldwork going. For attendance at one full 21-day session your contribution is rated at 50 euros a day for bed, light breakfast, mid-morning sandwich, cooked lunch, cooked supper, laundry, instruction, transport between base camp and site, excursions, transport between Murcia Airport to our base on official pick-up and set-down dates, 2018 membership of *MUPANTQUAT* (attendance at both sessions entitles you to a reduction to 45 euros a day, likewise for helpers from previous years who return; first-time attendance for less than a full 21-day session is rated at 60 euros a day). In order to guarantee your reservation of a place a non-returnable deposit is required and because of that you might want to take out holiday insurance in case of last-minute inability to come. Deposits have to be non-returnable, alas, because we are in a holiday-resort area with flights that are heavily booked well in advance of the July-August high summer season. So even if we have someone on a waiting-list when you drop out, that person might not be able to book a flight only a very few weeks before the session begins. This means we might well have to use deposited moneys in order to try to tempt one of our local undergrads to take your place instead of taking a well-paid vacation job in a bar or restaurant beside the packed beaches or at a golf resort, because, in order to have adequate help on site at all times so that we can carry out our excavations efficiently we need always to have on site a basic minimum number of people, below which we cannot work smoothly.

I and our staff look forward to seeing some of you again in 2018,

Yours truly

*Michael Walker*

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**SOME RECENT OR FORTHCOMING SIGNIFICANT PUBLICATIONS IN ENGLISH ABOUT WORK AT OUR SITES AND SOME RELEVANT ASPECTS (pdfs of many are available on request):**

2017 E.Trinkaus, M.J.Walker, Eds., *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain*, (Texas A&M University Press, College Station, Texas, USA, ISBN 9781623494803).

2017 M.J.Walker, *Palaeolithic Pioneers, Behaviour, Abilities, and Activity of Early Homo in European Landscapes around the Western Mediterranean Basin ~1.3-0.05 Ma* (Archaeopress, Oxford; ISBN 9781784916206. e-book ISBN 9781784916213).

2017 H.M.Manrique, M.J.Walker, *Early Evolution of Human Memory: Great Apes, Tool-Making and Cognition* (Palgrave-Macmillan/Springer-Nature, New York, ISBN 9783319644462, e-book ISBN 9783319644479).

Forthcoming, submitted for publication to *Historical Biology*: A.López Jiménez, M. Haber Uriarte, M. López Martínez, M.J.Walker, "Small-mammal indicators of biochronology at Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, SE Spain)" (ISSN 15635236).

Forthcoming, invited review submitted for publication to *Quaternary Science Reviews*: M.J.Walker, J.S.Carrión, "Background to Neanderthal presence in Western Mediterranean Europe" (ISSN: 0277-3791).

Forthcoming, currently being edited by the publisher Oxbow Books in preparation for going to press in 2018). M.J.Walker (coordinator), *How the Earliest Cave-Folk of South-East Spain were Dug Up: A journey full of archaeological and anthropological surprises. A book put together by the team excavating under the direction of Michael J. Walker at the sites of Cueva Negra del Estrecho del Río Quípar (the Black Cave of the River Quípar gorge) near Caravaca de la Cruz, Murcia, Spain, and Sima de las Palomas del Cabezo Gordo (Dove Hole on Cabezo Gordo hill) near Torre Pacheco, Murcia, Spain*.Oxbow Books, Oxford.

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# ANTIQUITY

Volume 90

Number 351

June 2016

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## Combustion at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Murcia, Spain)

M.J. Walker<sup>1,2</sup>, D. Anesin<sup>3</sup>, D.E. Angelucci<sup>3</sup>, A. Avilés-Fernández<sup>1,2</sup>, F. Berna<sup>4</sup>, A.T. Buitrago-López<sup>1,2</sup>, Y. Fernández-Jalvo<sup>5</sup>, M. Haber-Uriarte<sup>1,2</sup>, A. López-Jiménez<sup>1,2</sup>, M. López-Martínez<sup>1,2</sup>, I. Martín-Lerma<sup>1,2</sup>, J. Ortega-Rodríguez<sup>1,2</sup>, J.-L. Polo-Camacho<sup>1,2</sup>, S.E. Rhodes<sup>6</sup>, D. Richter<sup>7,8,9</sup>, T. Rodríguez-Estrella<sup>1,2,10</sup>, J.-L. Schwenninger<sup>11</sup> & A.R. Skinner<sup>12</sup>

*Control of fire was a hallmark of developing human cognition and an essential technology for the colonisation of cooler latitudes. In Europe, the earliest evidence comes from recent work at the site of Cueva Negra del Estrecho del Río Quípar in south-eastern Spain. Charred and calcined bone and thermally altered chert were recovered from a deep, 0.8-million-year-old sedimentary deposit. A combination of analyses indicated that these had been heated to 400–600°C, compatible with burning. Inspection of the sediment and hydroxyapatite also suggests combustion and degradation of the bone. The results provide new insight into Early Palaeolithic use of fire and its significance for human evolution.*



**Keywords:** Early Pleistocene, Palaeolithic, Acheulean, combustion, cognitive evolution

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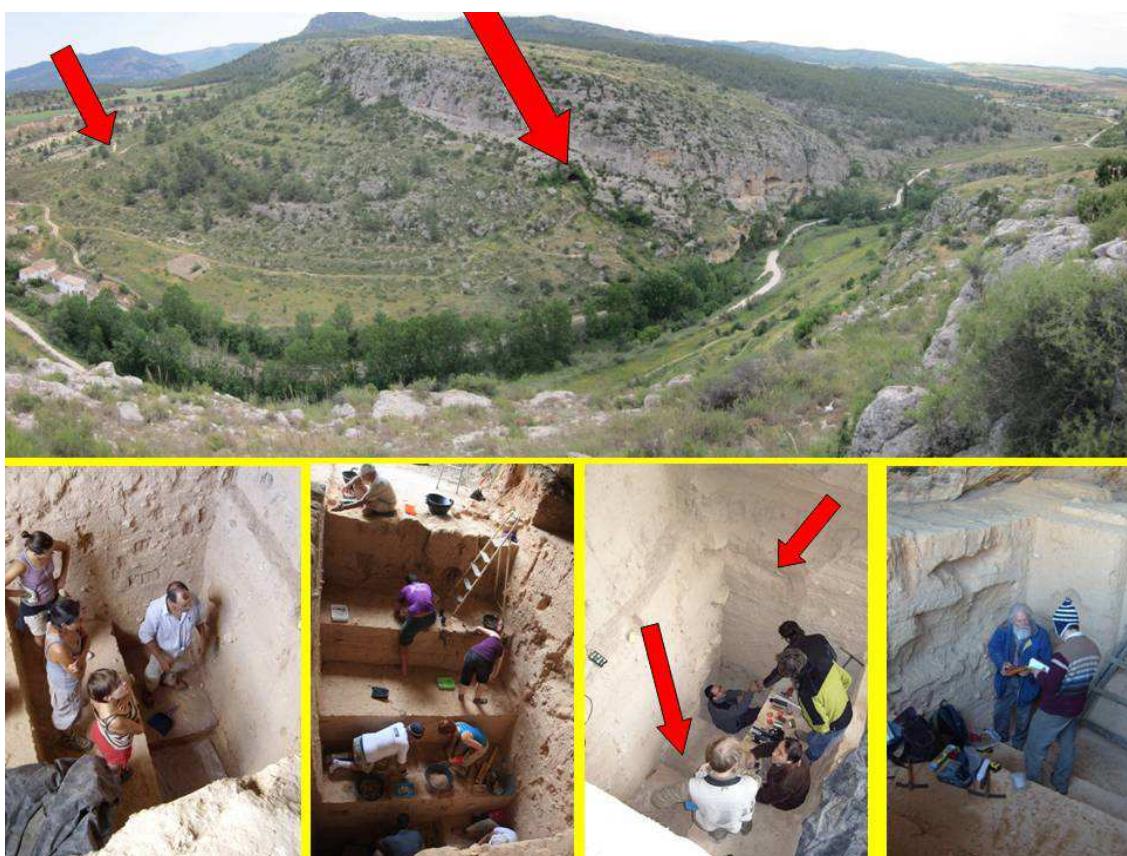
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ANTQUITY 90.351 (2016): 571–589

doi:10.15184/ajy.2016.91

(pdf available on request)





Above: big arrow marks the cave, small arrow marks nearest chert source. Below left-to-right:: geoarchaeologist Dr Diego Angelucci sampling sediment; team excavating; Drs Jean-Luc Schwenninger (OSL-dating specialist), Yanni Gunnell, Marc Calvet and Régis Braucher (cosmogenic nuclide expert) sampling in 2011 - foreground arrow shows burnt layer and upper arrow shows a small erosive feature; far right, Drs. Gary Scott and Lluis Gibert conducting palaeomagnetic research in 2008 which showed the entire depth of sediment to be older than 780,000 years ago (0.78 Ma).

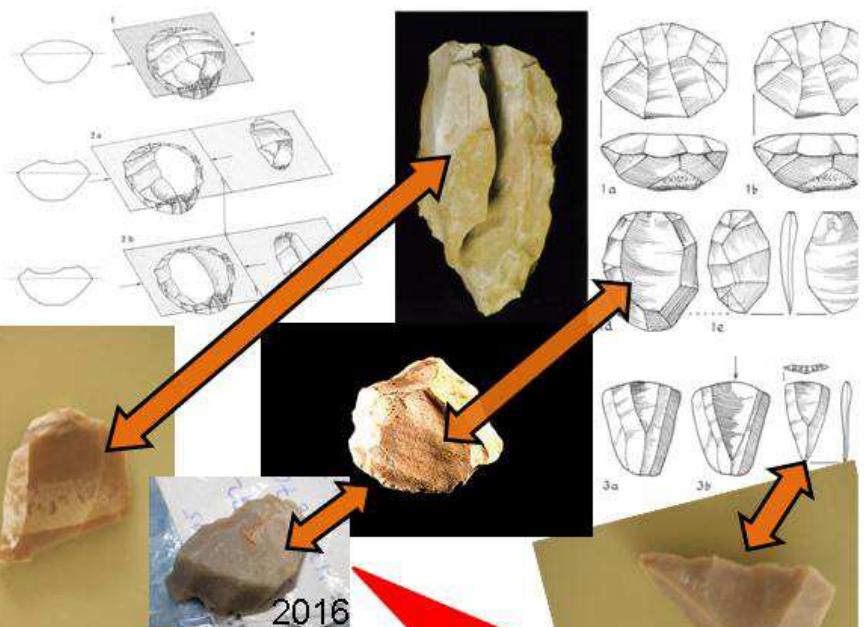
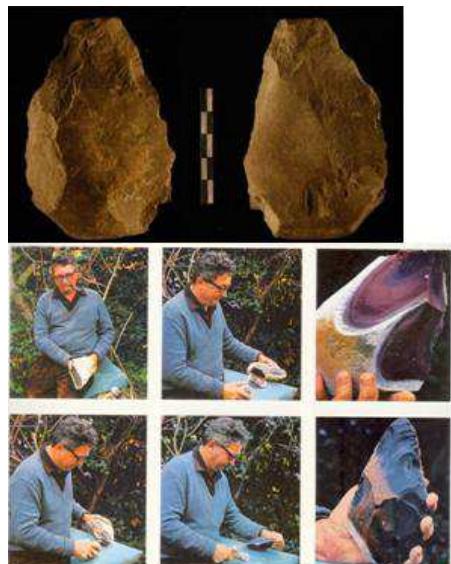




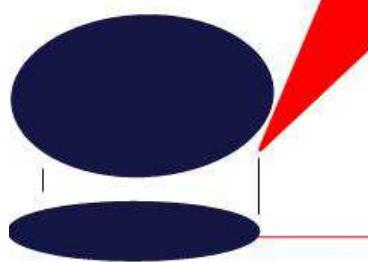
From modal scheme of John Shea "Lithic Modes A-I" *Journ. Archaeological Method and Theory* vol. 20, pp. 151-186, 2013, and *Stone Tools In Human Evolution*, Cambridge Univ. Press in press 2016.



See: Walker et al., 2016, A view from a cave: Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, southeastern Spain). Reflections on fire, technological diversity, environmental exploitation, and palaeoanthropological approaches. *Human Evolution* vol. 31, pp: 1-67 (pdf available on request).



At Cueva Negra 800,000 yrs ago  
*Homo heidelbergensis* exercised  
**CHOICE** between 2  
 alternative chains  
 of behavioural  
 activities



"Acheulian" bifacial fashioning of  
 a core into a "hand-axe" tool

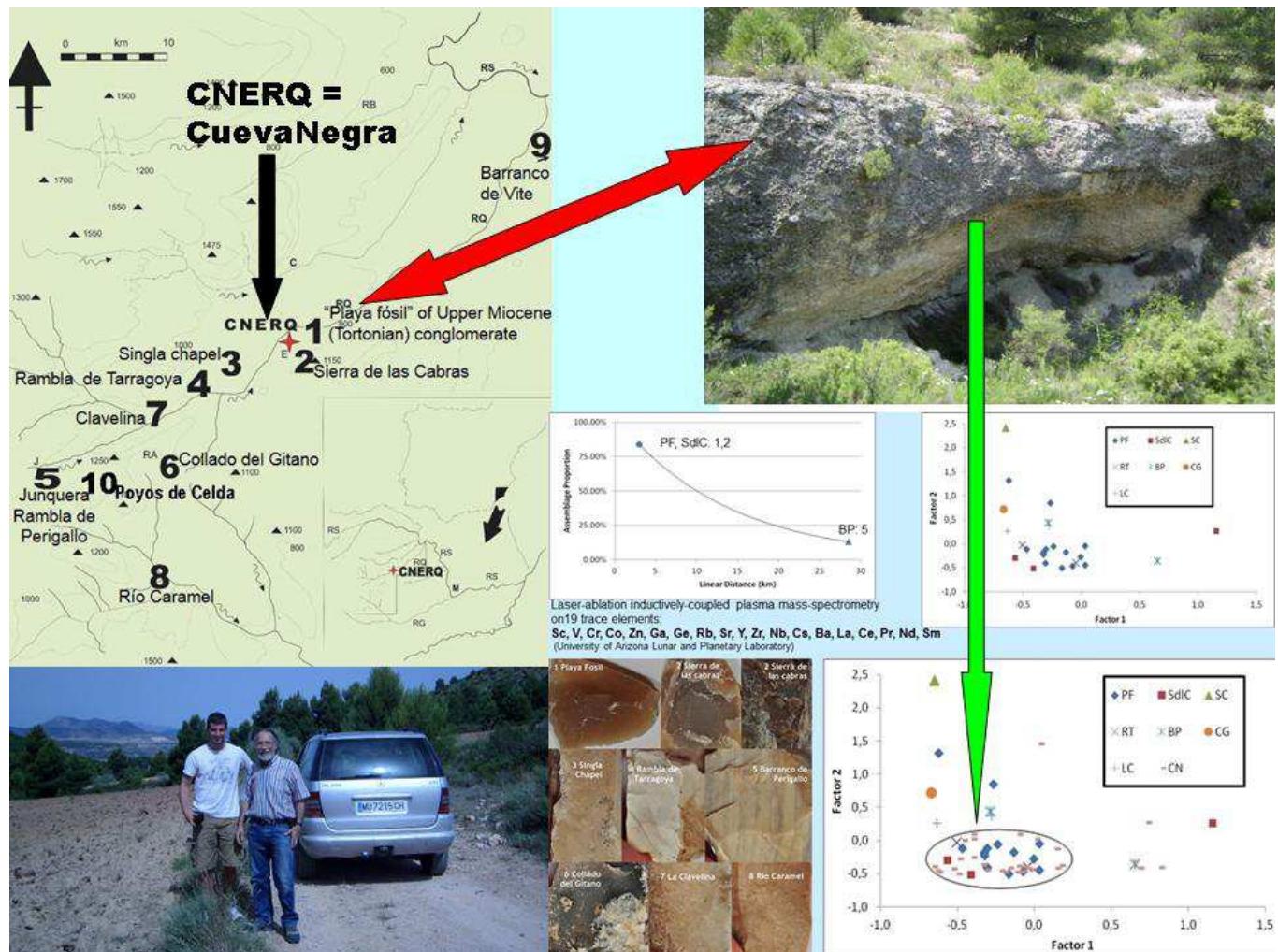
Hierarchical  
 ("Levalloisian"-type) removal of  
 prepared flakes of predetermined  
 shape to use as, or retouch into tools

## Cueva Negra and cognitive versatility as shown by different stone-knapping procedures



Stone tools and possible bone retoucher excavated at Cueva Negra. Red arrow points to signs on the bone which are typical of bone that has been used to retouch stone artifacts.

Trace elements were analyzed by laser-ablation-ICPMS at the University of Arizona, on chert samples collected by Winston Zack when he was a student there and a field helper here (shown with geologist Dr Tomás Rodríguez Estrella). Whilst a nearby conglomerate outcrop (top right) has chert similar to much chert excavated at Cueva Negra (in circle, bottom right), some chert excavated at the cave resembled samples collected further afield (middle and bottom right), implying that at 0.8 Ma the cave was used by people who roamed upto 30-40 km around it. Presented in 2014 at the 55<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age and published in 2013 (Zack et al., *Quartär* vol. 60 pp. 7-28, pdf available on request)



## Preliminary taphonomical assessment of the macromammalian zooarchaeological assemblage at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, Spain)

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### INTRODUCTION TO THE SITE

Cueva Negra, a spacious rockshelter in southeastern Spain (at 7400m.s.l.; lat.38.03679, 38°0'21.5"N; long.-1.88494, 1°53'5.8"W) contains mainly fine fluviacustrine sediments, deposited intermittently from an erstwhile swampy lake, without significant interruption [1] during a brief period between 0.78 and 0.99 Ma according to biochronology [2] and magnetostriatigraphy [3]. Palaeopalynology, mammalian palaeontology and avian fauna (including 6 waterfowl species) indicate temperate, humid surroundings (plausibly MIS-21). Micro- and macromammalian remains are broadly comparable with contemporaneous faunal assemblages in Spain (e.g., Atapuerca Gran Dolina TD6; Orce Basin FN-3 and BL-5 sites; Barranc de la Boella; Vallparadís; and at Quibas and Cueva Victoria in Murcia). Cueva Negra micromammals include *Platymys episodis*, *Microtus (Victoriomys/Allophomys) chalamei*, *Microtus (Mimomys) savini*, *Microtus (iberomys) huescarense*, *Microtus (Stenocanarius) gregaloides*, *Microtus (Terricola) arvalidens*, *Cricetulus (Allocricetus) bursae*, *Oryctolagus cf. giberita*, *Prolagus capensis*, *Crocidura cornuta*, *Apodemus cf. sylvaticus*, *Sorex* sp., *Erinaceus europaeus*. Macromammals include *Megaloceros novocarthaginiensis*, *Dama valmonensis*, *Capreolus* sp., *Hemitragus bonali* or *Capra alba*, *Bison* cf. *voigtsdorffensis*, *Equus altidens*, *Stephanorhinus cf. etruscus*, *Macaca* sp., *Sus scrofa*, *Lynx* sp., *Crocuta* sp., and fragments of proboscids, urids, and mustelids.

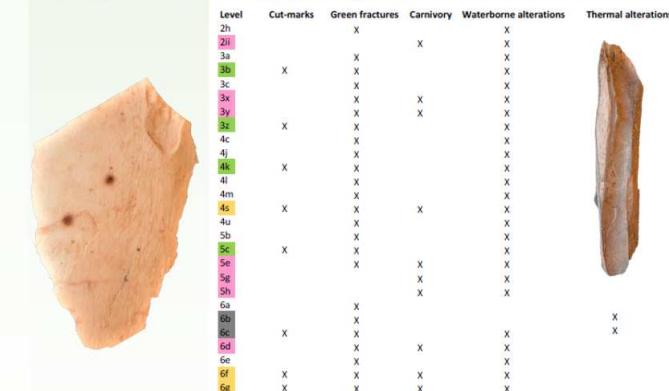
### METHODOLOGY

The present study assesses the nature of the taphonomical alterations present in a sample of the macromammalian bone assemblage of the site of Cueva Negra (n=223), corresponding to material retrieved in the 2013-2016 fieldwork seasons. The division of the site into levels of five centimetres within archaeological and lithostratigraphic units, coupled with the use of a total station and the high and rapid frequency of sedimentary deposition, permits high-resolution analysis of the distribution of taphonomical signatures. Furthermore, in order to understand the role of stone tools in animal processing, a three-dimensional virtual reconstruction was undertaken on a small sample of cut-marks that were analysed from a geometric-morphometrical perspective by principal components analysis. This study compared 10 cut marks from the Cueva Negra excavation site with cut marks produced by experimentally produced flakes made of raw materials from the Iberian Peninsula.

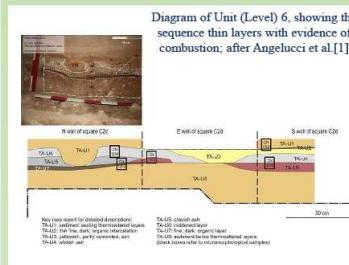
### RESULTS

Preliminary taphonomical assessment of macromammalian bones reveals well-preserved cortical surfaces showing sparse or nonexistent edge-rounding, and limited signs of trampling or weathering. The bone surfaces of most levels tend to bear signatures of biochemical traces, including perhaps manganese precipitation, and also occasionally of root-etching and waterborne alterations. This pattern implies sporadic waterlogging with negligible transport energy (responsible for accumulation of predominantly fine sediment in the cave [1]). Postdepositional processes and horizontal displacements appear to have been slight, within a range of only a few metres.

Cutmarks and percussion marks are noteworthy on meat-bearing humeral and femoral diaphyseal fragments. Green fractures occur across a broad range of macromammalian sizes throughout the sequence. The assemblage is highly fragmented. Fragments 10-60 mm in size predominate, especially those from the deepest levels. Some carbonized or calcined bones attest to exposure to combustion in levels 6a-6c (grey below). A limited presence of carnivores in particular levels of the sequence (2ii, 3x-3y, 5e-5h, 6d; in pink below) is inferred from sporadic carnivory, including tooth marks, taphotypes, and columnar transversal fracture planes. Some of these levels might represent hiatuses between occupation at phases.

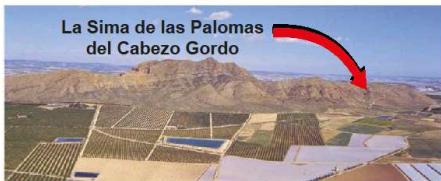


Moreover, some levels (in gold above), such as 4s, show evidence of carnivore activity as well as cut-marks and green fractures from dynamic percussion, which may indicate some degree of human-carnivore interactions. Levels 6e-6g are particularly interesting: the sporadic presence of carnivore traces, taken together with a highly fragmented assemblage, implies a brief although relatively intense phase with human presence very early in the sequence at the site.



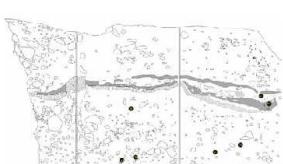
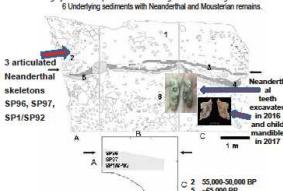
## Preliminary dating of deep layers at Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

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La Sima de las Palomas  
del Cabezo Gordo

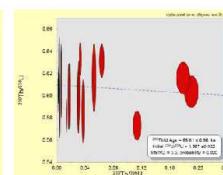
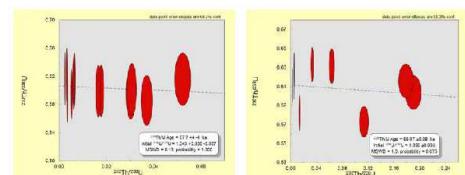
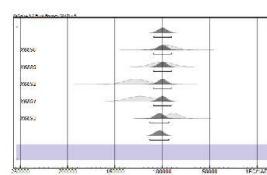
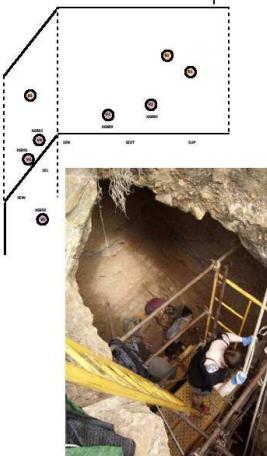
1 Tuffing with Neanderthal and Mousterian finds accumulated around 2.  
2 Conglomerate A containing the Neanderthal skeletons. 3 Iron lens.  
4 grey sediment deposited under reducing conditions. 5 conglomerate B.  
6 underlying sediments with Neanderthal and Mousterian remains.



Neanderthal skeletons SP92,-96,-97 dating from ≈50 ka were embedded in a partly-cemented éboulis, Conglomerate A, that, along with surrounding sediments, yielded up remains altogether of 10 Neanderthals, Mousterian artifacts, and dates from between ≈37 and ≈65 ka taking account of confidence intervals for U-series, OSL and <sup>14</sup>C determinations [1]. Conglomerate A plausibly falls between Heinrich 5 (47 ka) and 6 (61 ka) in MIS-4. Below it, Conglomerate B, a 10-15 cm thick rock-hard bed of heavily-cemented dense scree, completely sealing underlying sediments, in 1999 had given a <sup>230</sup>Th/<sup>234</sup>U estimate on calcite of 56+13/-10 ka. Sediments below Conglomerate B yielded up two Neanderthal incisor teeth in 2016 and contain abundant Palaeolithic and palaeontological finds, including burnt bone fragments (maybe domestic rubbish that Neanderthals threw 5 m down the shaft from its mouth). U-series dates (right-hand-side and bottom figures) have been determined of **67.70±0.405** and **65.07±0.038** ka (<sup>230</sup>Th/<sup>234</sup>U, <sup>234</sup>U/<sup>238</sup>U), undertaken at the University of Reading on calcite crystals extracted from a block of Conglomerate B. Sub-samples were extracted from the sample via micro-drilling and then analysed on Thermo-Fisher iCAPQ ICP-MS for <sup>238</sup>U, <sup>232</sup>Th, and (<sup>230</sup>Th/<sup>232</sup>Th) and (<sup>234</sup>U/<sup>238</sup>U) ratios. Samples were run also on a BeGe Gamma detector where (<sup>230</sup>Th/<sup>232</sup>Th) and (<sup>234</sup>U/<sup>238</sup>U) ratios were determined and combined with MS data. Below Conglomerate B, 5 sediment samples (V1 to V5) taken from the exposed excavation profile were dated by optically stimulated luminescence (OSL) (left-hand-side figures). Samples were prepared and measured at the Luminescence Dating Laboratory of the Research Laboratory for Archaeology and the History of Art at the University of Oxford using instruments manufactured by Risø National Laboratories (Denmark) and Freiberg Instruments (Germany). Palaeodose determinations obtained from sand-sized (180-250 mic) quartz mineral grains, using a single-aliquot regenerative (SAR) dose-measurement protocol, gave these preliminary MIS-4/MIS-5 age estimates: **102.1±12.0** ka (X6889; V1), **97.0±9.0** ka (X6890; V2), **125.0±13.6** ka (X6891; V3) and **130.2±11.9** ka (X6892; V4), with uncertainty affecting **90.3±7.3** ka (X6893; V5) for technical reasons. Nevertheless, geologically-speaking the sedimentary deposit was more or less contemporaneous, and the dates accord with the excavated stratigraphical sequence in which the published Neanderthal skeletal remains lay above Conglomerate B that is dated here to the MIS-5a/MIS-4 transition, sealing the deep sedimentary deposit from which stage MIS-5 estimates are offered, and which has yielded up Neanderthal teeth and Mousterian artifacts.

[1] Trinkaus, E., Walker, M.J. (Eds), 2017, *The People of Palomas, Neandertals from the Sima de las Palomas, Cabezo Gordo, Southeastern Spain* (Texas A&M University Press "Anthropology Series N°. 19", College Station, Texas).

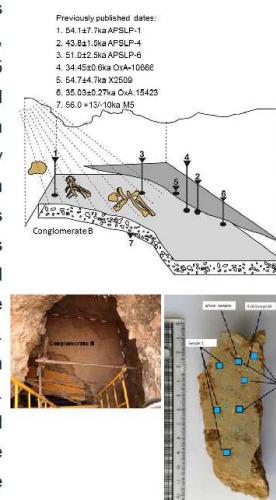
### OSL samples dating



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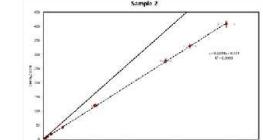
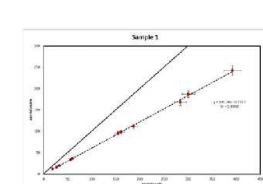
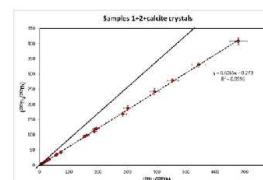


University of  
Reading



Sub-Sample	U-series age
Sub-Sample 1	67.70 ± 0.405
Sub-Sample 2	65.070 ± 0.038
Combined sample (1+2+calcite)	65.610 ± 0.980

<sup>230</sup>Th/<sup>232</sup>Th, <sup>234</sup>U/<sup>238</sup>U  
samples, dating



## Neanderthal attention to the dead at Sima de las Palomas del Cabezo Gordo (Murcia, Spain)



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Geography, Paleontology, Material Archaeology and Technology, International Team Professor J. S. Carrasco-García, Department of Paleontology, Biology Faculty, Murcia University, Campus Universitario de Espinardo s/n, 30100 Murcia, Spain

Flexed knees and elbows, with hands raised up beside the face, of both a young Neanderthal woman (SP96) and a child beneath her (SP97), suggest intentional arrangement before *rigor mortis* developed. Excavation discovered the skeletons in anatomical connexion, their heads to W. lying within cemented rocks 1.5–2 m below the rock overhang above the karstic shaft (sima); there was no burial pit. Beneath the child lay articulated parts of another adult skeleton with an extended elbow (SP92). Near the child were 2 articulated leopard paws. A parsimonious interpretation is that a single anthropogenic process had impinged on both human and leopard body parts such that articulation was retained and scattering by scavengers avoided (further deterrence perhaps afforded by rocks thrown over the bodies). The aforementioned bones show neither charring nor cut-marks. Charred articulated horse ankle bones, 9 Mousterian flint tools, 12 flakes and 100 fragments of knapping waste were excavated nearby. A direct U-series date on Neanderthal bone of  $54,100 \pm 7700$  BP (APSLP-1) is in line with excavated material dated to  $51,000 \pm 2500$  (APSLP-6) by U-ser and  $54,700 \pm 4700$  BP (X2509) by OSL, as well as a U-ser sample from near SP1/SP92 of  $56,000 \pm 13000$ –10000 (though yet another U-ser date and two  $^{14}\text{C}$  are likely underestimates; Walker et al., 2012). An intriguing contrast exists between the 3 nearly-complete articulated skeletons and sparse remains of 6 other Neanderthal individuals known from the site, including some burnt bones (a burnt leopard temporal bone could imply Neanderthal dominance). The skeletons were separated by an almost impenetrable conglomerate bed from underlying sediments containing yet more Mousterian tools and abundant fragments of burnt animal bones.



SP96 ("Paloma") was a short 16–20 year-old woman, lying on her left side, with skeletal parts connected anatomically (rib cage, shoulder and pelvic girdles, flexed knees and elbows, hands beside her crushed skull and mandible; altogether >70 different bones exist, including all major limb bones except for her feet. Walker et al., 2011).



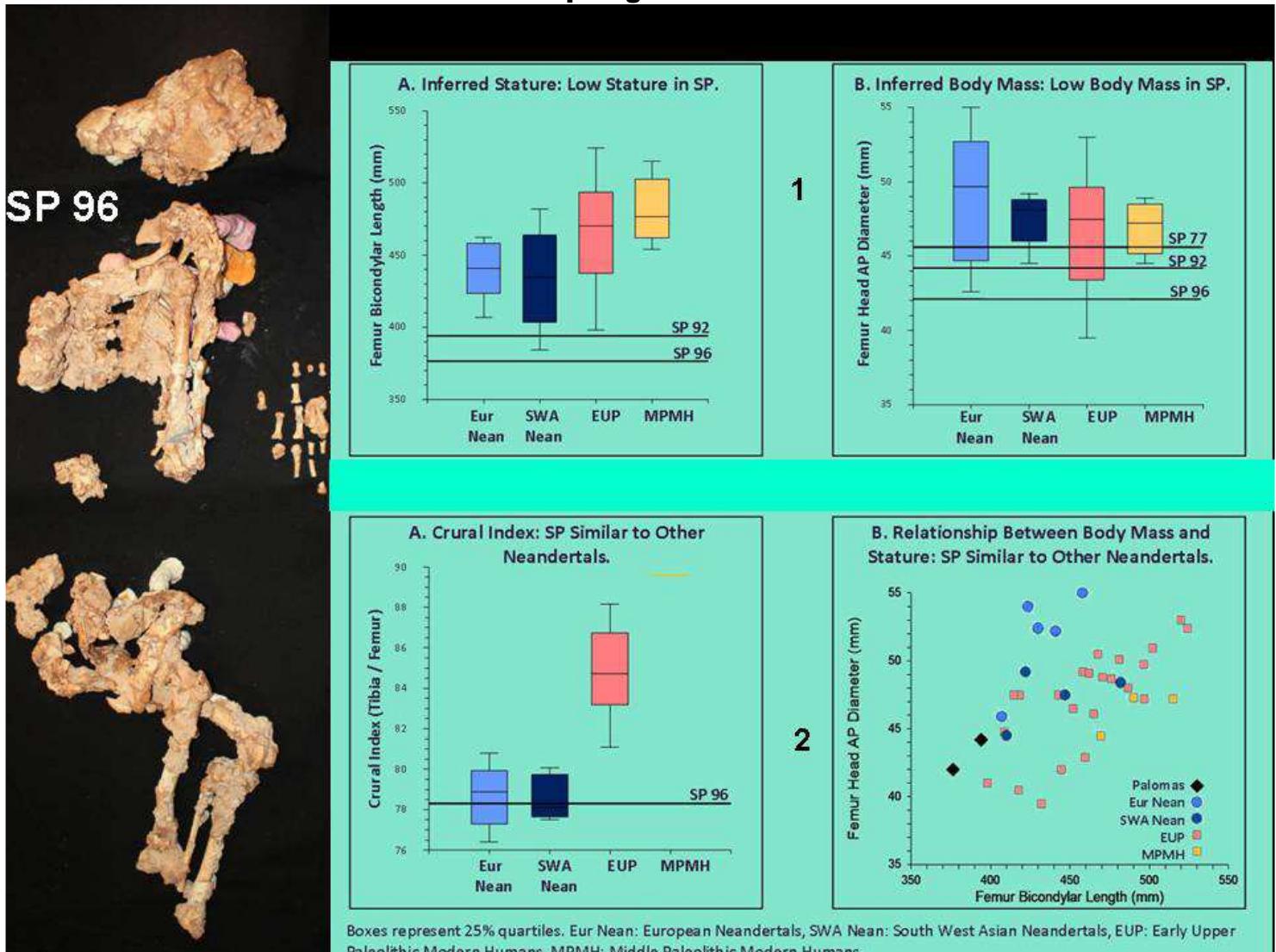
CAT scanning of SP97, undertaken to enable virtual reconstruction, revealed hand bones hidden in sediment cemented to the child's forehead (SP97 has cranium, mandible and >34 different bones).

SP92 has 60 different bones; very likely its head (SP1) was the crushed mandible and maxillae found by a speleologist in 1991 in a place according well with SP92's W-E orientation (its articulated foot bones lay at E). One elbow was excavated in the extended position. All 3 skeletons were excavated in our 12th to 15th annual field seasons (2005–8). Laboratory removal of adherent breccia with vibroscalpels continues.

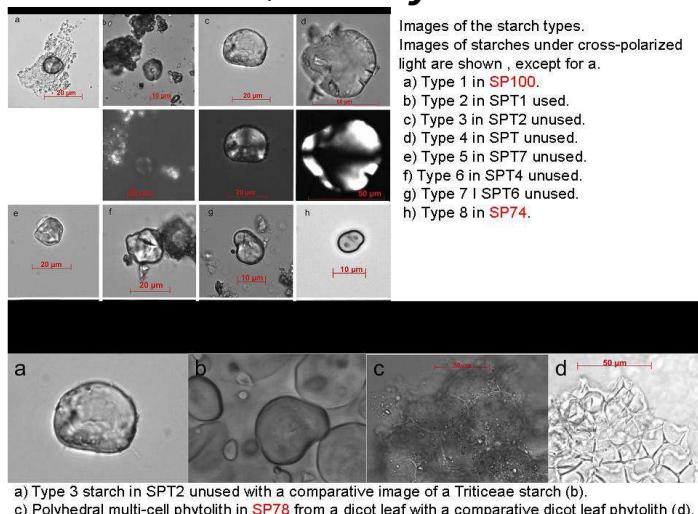


Arranging cadavers before *rigor mortis* develops implies Mousterian attention paid to flexing knees and elbows, with hands raised to the face, among Neanderthals (Regourdou; Shanidar 7) and anatomically modern humans (Skhul 4 and 7), though knee flexion is more widespread (Defleur, 1993, esp. p. 233). The completeness of SP96 "Paloma" highlights comments both by Anne-Marie Tillier (1982), namely, "La présence du squelette ou d'une grande partie du squelette en connexion n'est pas un phénomène naturel et il ne semble pas indispensable de mettre en évidence une structure artificielle pour envisager un dépôt volontaire du corps..." (cf. Pettitt, 2002), and also by Erik Trinkaus (1989) who remarked, in response to Robert Gargett's scepticism about some allegedly intentional Neanderthal burials, that several Neanderthal articulated skeletons "managed to be preserved in highly accessible Upper Pleistocene rock-shelters and caves in near-anatomical position and over-all skeletal-part frequencies identical to those of recent cemetery samples... These partial skeletons retain many fragile elements largely intact, despite the ubiquitous presence of carcass-destroying carnivores... the lack of evidence in most cases for sufficiently rapid natural sedimentation rates to shield them from scavengers, and the absence of comparably preserved nonhominid skeletons in similarly accessible Upper Pleistocene locales" – Trinkaus was referring to whole animal skeletons which our leopard paws are anything but!

**"Paloma" SP96, the short adult Neanderthal woman from Sima de las Palomas, in the context of measurements of other Neanderthals and early humans shown in graphs taken from a poster presented at the 78th Congress of the American Association of Physical Anthropologists 2009.**



**Phytoliths analyzed in Sima de las Palomas Neanderthal dental plaque show that starchy plant foodstuffs were chewed; photo from D.C.Salazar-García, R.C.Power, A.Sanchis Serra, V.Villaverde, M.J.Walker, A.G.Henry, 2013, "Neanderthal diets in central and southeastern Mediterranean Iberia" *Quaternary International* vol. 318, pp.3-18.**



# ENAMEL THICKNESS AND DENTAL TISSUE PROPORTIONS IN THE NEANDERTALS FROM THE SIMA DE LAS PALOMAS DEL CABEZO GORDO, SOUTHEASTERN SPAIN

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Many studies have focussed on enamel thickness (ET) and dental tissue proportions (DTP) in Neandertals and their comparison with modern humans. Neandertal deciduous and permanent teeth (mainly molars) have been described as having similar enamel volumes to modern humans, albeit deposited over a topographically more complex enamel-dentine junction surface and with larger dentine volumes. Thereby Neandertal teeth show thinner average and relative enamel thicknesses.

- Little quantitative information on anterior teeth and premolars
- Chrono-geographical trends in Neandertals?
- The variation encompassed by Neandertal molars has been reported as less than in recent humans [1].

Here we report on results of microCT-based analysis of ET and DTP in Neandertal teeth from Sima de las Palomas del Cabezo Gordo (SPCG, Torre Pacheco, Murcia, Spain). They are compared to data for Middle, Late Pleistocene and Holocene archaic and modern humans.

TABLE 1. Number of teeth that have been studied per tooth position												
	di1	dc	dm1	dm2	I1	I2	C	P3	P4	M2	M3	Total
sup	1		1	1	1	2	2	3	2		1	14
inf		1	1	3		1	4	2	2	1	2	17

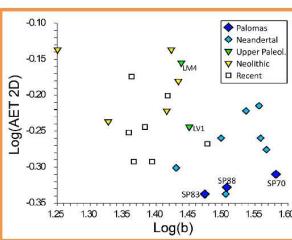


FIGURE 1. Plot of 2D AET (log) against coronal dentine and pulp area (log) for 3 SPCG dm, compared to Neandertals, and modern humans.

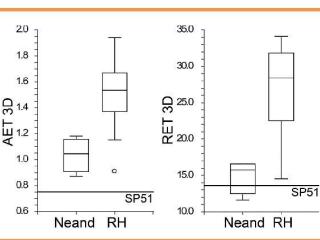


FIGURE 2. Boxplots of 3D AET and RET in the Palomas 51 M<sup>3</sup> compared to Neandertals (Neand), and recent humans (RH).

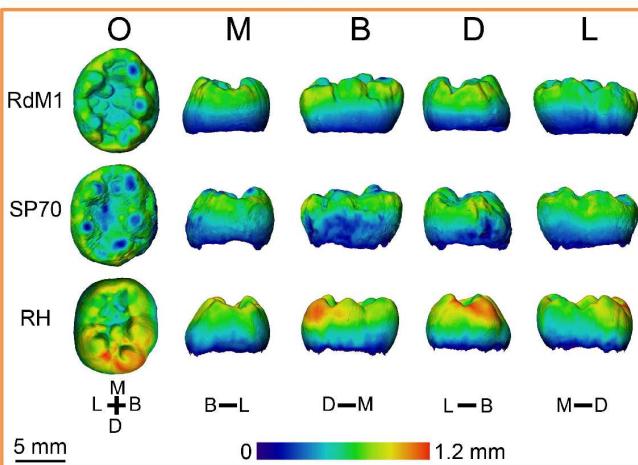


FIGURE 3. Comparative enamel thickness cartographies of the virtually reconstructed dm, crowns of Palomas 70 (SP70), Roc de Marsal 1 (RdM1), and recent human mean distribution (RH). Topographic variation is rendered by a thickness-related pseudo-color scale ranging from dark blue (thinner) to red (thicker). Teeth are shown as left in occlusal (O), mesial (M), buccal (B), distal (D), and lingual (L) views.

The microCT-based survey of the Palomas teeth considerably increases the number of Neandertal specimens known so far for 2D and 3D DTP and ET, particularly of incisors and canines. It also offers the unique opportunity to study the variation of these traits in a constrained chrono-spatial context. As a whole, the Palomas internal tooth structure aligns with the Neandertal range of variation, for the deciduous and permanent dentition and for all tooth positions. Notably, as shown on permanent teeth of other Neandertals, the deciduous and permanent upper incisors from Palomas also show a different signal from the rest of the dentition. However, the Palomas data extend the Neandertal variation known so far for several teeth. It also provides substantial variation within tooth types, suggesting that the intra- and inter-population variation in Neandertal internal dental structure is far from being documented.

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## ACKNOWLEDGMENTS

The transportation of the microCT scanner to Murcia was funded by the LabEx des Sciences Archéologiques de Bordeaux (ANR program of prospects investments, ANR-10-LABX-52, DHP project), a Benjamin Meeker Visiting Fellowship, and the University of Bristol Institute for Advanced Studies. Some comparative microCT data used in this study were produced through the microCT facilities of the MRI platform and LabEx CeMEB thanks to a funding from IdEx Bordeaux/CNRS (ANR-10-IDEX-03-02, 3DentIn project). For help and discussion, we thank Luca Bondioli, Nick Corps, Pauline Colombet, Isabelle Crevecoeur, Christopher Dean, Renaud Lebrun, Mariano López-Martínez, Roberto Maccharelli, Bruno Maureille, Arnaud Mazurier, Jon Ortega, Laurent Puymerail, Stéphane Rötter, Erik Trinkaus, Clément Zanolli, and Josefina Zapata.



# Dental calculus indicates widespread plant use within the Neanderthal dietary niche

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## INTRODUCTION

Research has focused on how Neanderthal dietary ecology is linked to their biogeography, population history and eventual demise. The ability of these humans to settle in contrasting habitat implies success at adapting to new conditions. Many isotope and zooarchaeological studies indicate that Neanderthal diet focused on ungulates, with little variation (Richards et al. 2009; Stiner 2013; Wißing et al. 2015). However there are difficulties detecting some foods, especially plants (Henry et al. 2015; Salazar-García et al. 2013). To deduce if Neanderthal plant use varied, we explored plant microremains in dental calculus from Neanderthal remains from across their range, and used microremain types as a metric to assess if breadth of consumed plants varied across their range.



## METHODS

We sampled calculus deposits from 14 Neanderthal teeth from a variety of sites (Table 1). From each site we also collected controls, including cave sediment and dust from the skeletal material, as well as calculus from herbivores and carnivores.

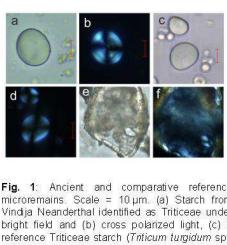


Phytoliths were classified into conventional morphotypes, while starch was classified into types we developed based on shared morphology (Madella et al. 2005).

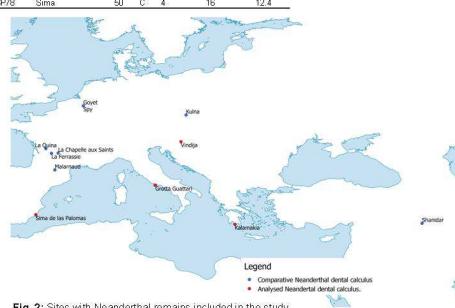
We predicted that if Neanderthal plant use was driven by ecology, then the number of consumed types is driven by temperature and tree cover. We used a random effect Poisson model to test dietary breadth patterns.

**Table 1.** Palaeoenvironment reconstructions for each specimen used in this study. Publication code references 1 = this study, 2 = Henry et al., 2014, 3 = Salazar-García et al., 2013. Fossil age is calculated by using the mean of the calendric ages.

Site	BP	Tr	Paleotemp	Jun-Aug	MET
Fessa 3	Grotta Fossile	70	O - 5	16	11.6
Circeo 2	Grotta Guattari	55	O - 4	16	11.71
Circeo 3	Grotta Guattari	67	O - 4	16	11.6
KAL 1	Kalamakia	91	O - 4	20	13.33
KAL 3	Kalamakia	63	O - 4	20	13.33
KAL 5	Kalamakia	63	O - 4	20	13.33
KAL 8	Kalamakia	63	O - 4	20	13.33
12.1	Vindija	34.3	O - 5	20	12.22
12.2	Vindija	34.3	O - 5	20	12.22
12.4	Vindija	34.3	O - 5	20	12.22
12.5	Vindija	34.3	O - 5	20	12.22
12.6	Vindija	34.3	O - 5	20	12.22
12.7	Vindija	34.3	O - 5	20	12.22
11.3	Vindija	49.5	O - 5	20	12.22
11.45	Vindija	49.5	O - 5	20	12.22
11.46	Vindija	49.5	O - 5	20	12.22
11.4	Vindija	49.5	O - 5	20	12.22
SP45	Simsa	50	C - 4	16	12.4
SP53	Simsa	50	C - 4	16	12.4
SP54	Simsa	50	C - 4	16	12.4
SP58	Simsa	50	C - 4	16	12.4
SP60	Simsa	50	C - 4	16	12.4
SP62	Simsa	50	C - 4	16	12.4
SP74	Simsa	50	C - 4	16	12.4

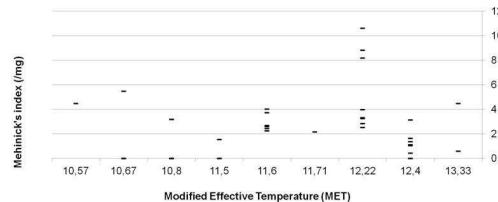


**Fig. 1.** Ancient and comparative reference microremains. Scale = 10 µm. (a) Starch from Vindija Neanderthal identified as Triticeae under bright field and (b) cross polarized light, (c) a reference Triticeae starch (*Triticum turgidum* sp.) under normal and (d) cross polarized, (e) Amyloplast with several ovoid starches resembling *Lilium* bulb starches under bright field and (f) cross polarized light.



## RESULTS

We find no relationship between the number of types and the chronological age or environmental conditions, even when accounting for variation of tree cover, sites, analyst, age, and weight of the sample ( $\chi^2 = 5.14$ , df=4, P=0.27). We obtained the same results even when we accounted for a potentially different age for the Vindija bones ( $\chi^2 = 2.68$ , df=4, P=0.61).



**Fig. 3:** A Mehlinick's diversity index of types of ancient starch and phytolith (per mg) from Neanderthal dental calculus shows that warmer climates are not associated with increased diversity. Samples are from Neanderthal remains presented in this study and Salazar-García, et al., 2013 and Henry et al., 2014. Each dash represents an individual sample.

**Key:**  
**Mehlinick's Index:** a richness metric common in ecological studies, which is the ratio of the number of taxa to the square root of sample size (Magurran, 2004).  
**Modified effective temperature:** based on effective temperature (Binford 1980, 2001) but differs from effective temperature in that it uses the mean of the three warmest and three coldest months instead of the warmest and coldest month.

## CONCLUSIONS

The number of microremain types is relatively homogenous across regions. There was no evidence to suggest that vegetal dietary breadth was considerably lower in cool regions. Our data suggests that plant-harvesting strategies existed, in both cool and warm regions, providing valuable micro- or macronutrients rather than caloric energy alone.

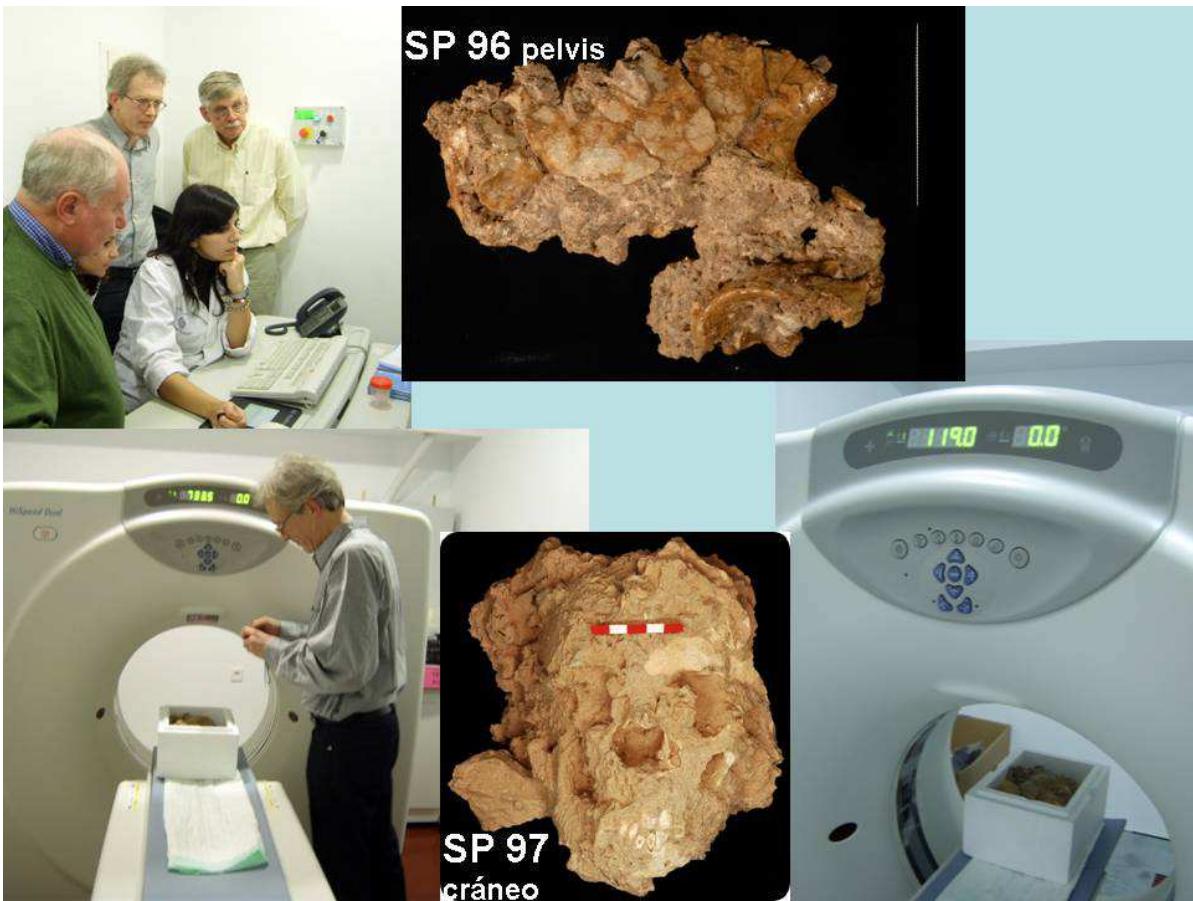
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## ACKNOWLEDGMENTS

The Max Planck Society provided financial support. We thank Dejana Brajkovic, Jadranka Lenardic, Ivan Gusic, Ivor Karavacic, Philip Nigst, Fred Smith, Tamara Dogandzic, Raffaele Sardella for sampling support and helping with archaeological interpretation. We are grateful to Pat O'Reilly for mycological advice. We are also thankful to Antje Hutscherreuther, Joerg Watzke for lab support, Kathryn Fitzsimmons for climate history help, Karen Ruebens for GIS advice, Paschal Verdin, Sanjay Eksambekar, Linda Perry, Marco Madella for microremain identification and finally Dave Pollard, Robert Foley, William Davies for advice on using Stage 3 Project data.

Printed in Universitätsrechenzentrum Leipzig



**Sima de las Palomas: Professors Michael Walker, Christoph Zollikofer and Erik Trinkaus studying the pelvis of SP-96 “Paloma” and child skull SP-97 with Murcia University Veterinary Hospital CAT scanner in 2011**



**Sima de las Palomas: Biologist and MUPANTQUAT committee member Jon Ortega excavating SP-92 and its articulated foot in 2005; Jon Ortega with Drs. Christoph Zollikofer and Marcia Ponce de León studying Sima de las Palomas Neanderthals at Murcia University Veterinary Hospital’s CAT scanner (bottom right) in 2011 and analyzing the digitalized scanned images at Zürich University’s Anthropology Institute (top left).**

# THE SIMA DE LAS PALOMAS NEANDERTHAL SKELETONS

## First steps towards “virtual” reconstruction

Michael J. Walker 1, Jon Ortega-Rodríguez 1, Amalia Agut-Giménez 2, Marta Soler-Laguia 2, Christoph P. E. Zollikofer 3, Marcia S. Ponce-de-León 3

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2- Departament of Animal Medicine and Surgery; University of Murcia

3- Anthropological Institute; University of Zurich



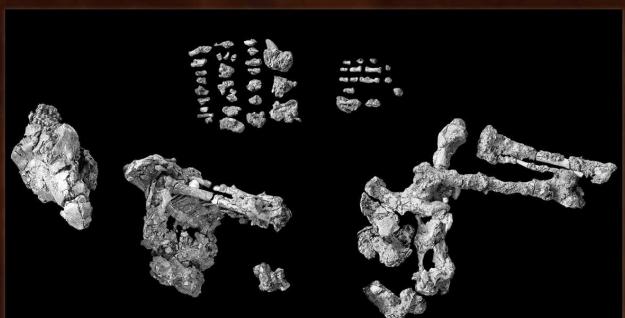
Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain) is a natural karst shaft in a marble outcrop. From about 120,000 BP it became filled with sediment that was partly removed by miners 100 years ago. Following chance discovery there of a human fossil in 1991, it has provided remains of at least 9 Neanderthal individuals dated to about 50,000 BP, together with Mousterian Palaeolithic implements (Walker et al., 2008, 2010, 2011a, 2011b, 2012).



Cabezo Gordo mountain.



SP96 fossil location next to excavation west profile.

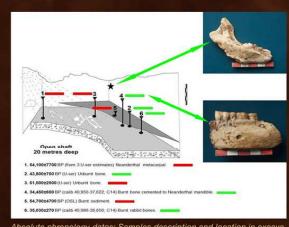


SP96 female adult skeleton, partially cleaned.



SP97 infant skull, partially cleaned.

About 2 m below the overhanging roof of marble rock, three remarkably complete articulated Neanderthal skeletons, of unusually small adult stature, were excavated in cemented large angular scree (éboulis) between 2005 and 2009 by an international research group coordinated by Michael Walker at Murcia University's Subdepartment of Physical Anthropology. Very many bones were found in correct anatomical connexion, which has enabled adult stature to be ascertained with great accuracy and precision. At excavation, however, they were found encrusted in a heavily-cemented sedimentary matrix, and several had undergone some deformation, very likely post-depositional. It is possible that the three articulated skeletons were covered with large stones to avoid disturbance by leopards and hyenas whose bones also occur at the site. Latterly, excavation of deeper levels has found extensive evidence of earlier use of the site in the form of abundant burnt animal bones together with stone tools, and the site may well have been significant to the local Neanderthals.



Absolute chronology dates: Samples description and location in excavation area.



CAT scanning at Murcia University.

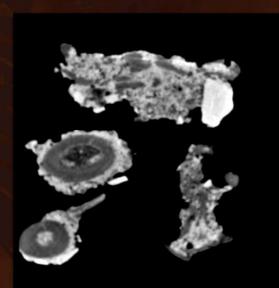
Laboratory cleaning and preparation of the skeletal components at Murcia University's Subdepartment of Physical Anthropology have been enhanced both by computer-assisted tomography (CAT) scanning of fossil-containing blocks of cemented sediment in order to locate the fossils, with precision and accuracy, and by employing CTS vibroscalpels, powered by compressed air, in order to remove cemented sediment adhering to the bones (thereby avoiding many risks inherent in traditional cleaning methods). CAT scanning is a necessary prerequisite for the application of methods of computer-assisted palaeoanthropology (CAP) in “virtual” reconstruction of bones that had undergone deformation in antiquity, thereby enabling accurate and precise osteometry and palaeoanthropological comparisons (Zollikofer & Ponce de León, 2005). We are carrying out scanning at Murcia University's Department of Animal Medicine and Surgery using a sixth-generation helical GE scanner at the University Veterinary Hospital.



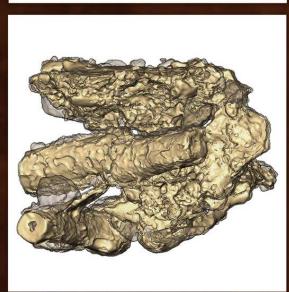
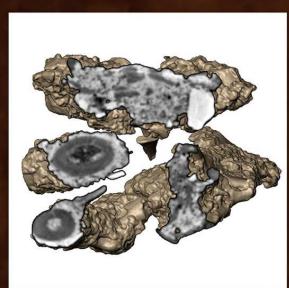
SP96 lower limb skeleton before and after physical sediment removal.



CTS vibroscalpel.



Non-invasive matrix removal from Palomas SP96 femoropelvic remains using a “virtual acid bath” algorithm that gradually erodes sediment layers in analogy to physical preparation.



Initial steps have been taken towards undertaking “virtual” reconstruction using CAP methodology with AVIZO and OSIRIS software thanks to collaboration by the Zurich University Anthropological Institute. Particular consideration is being given to Sima de las Palomas Neanderthal adult skeletons such as SP96 and SP92, and the child skeleton SP97.

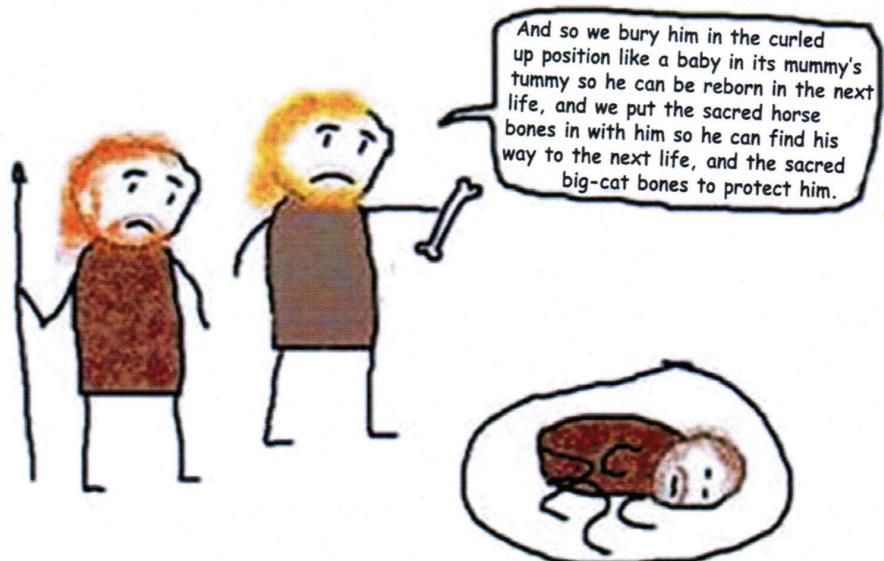
### ACKNOWLEDGEMENTS:

Staff and students at Murcia University (Subdepartment of Physical Anthropology, Department of Zoology and Physical Anthropology, Biology Faculty, and CAT Unit), Department of Animal Medicine and Surgery, University Veterinary Hospital, Veterinary Faculty) and at the Zurich University Anthropological Institute; and members of the international field research team excavating Sima de las Palomas, and most especially we thank assistance and advice given by Professor Erik Trinkaus of the Washington University of St.Louis, USA.

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*what scientists think happened...*



*what really happened*



*Neanderthals had an unimaginative down-to-earth approach to everyday life - and death - and lacked mental capability for abstract speculation.*



**Poster presented in 2014 at the 23<sup>rd</sup> Annual Meeting of the Palaeoanthropology Society (and also in 2014 at the joint meeting of the International Council on Archaeozoology ICAZ and the International Palaeontological Congress, with the slightly different title “Evidence for cultivated fire during the late Early Paleolithic in southeastern Spain: preliminary results from a micromammal taphonomic approach”)**



## Evidence for cultivated fire during the late Early Paleolithic in southeastern Spain: preliminary results from a micromammal taphonomic approach

Rhodes, S.E.<sup>1</sup>, Walker, M.J.<sup>2</sup>, López-Martínez, M<sup>3</sup>, Haber-Uriarte, M.<sup>4</sup>, López-Jiménez, A.<sup>2</sup>

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## Site background

Cave No. 60 (Elche) is an inland rock-shelter in Spain that was used as a lithic workshop. Paleolithic hand axes were found at the site. The deep limestone bedrock provides a source of paleolithic raw material and micro-mammalian fossils, particularly remains of the Iberian mammoth ( $\sim$ 78 Ma). Excavations in 2011 yielded a shallower layer of dark-colored sediment (the burnt layer), which shows signs of thermal alteration and contains large, flattened charcoal while containing large mammal bones. The most striking discovery was a human fragmentary skull of a child found in the burnt layer.

How can we know that we have Reached a Perfect state?



## Materials and methods

The data presented herein was collected over 3 months at the University of Miami and the MNCN in Madrid. Visually identified color modifications in bones were compared from 0-6m deep waters within three main zones (C1a, C1b and C1c). The benthic zone extends to a depth of 130-140 m, and is possibly as a dark grey/black layer overlaying reddish-brown mud in unit C1a. Adjacent to this (unit C1c) is included a hydraulically sedimented margin as indicated (Angermeier et al., 2013). Unit 4,000' specimens were identified to element and class (as whole shell or all skeletal material). Of these, 1,291 small mammal specimens were reported for hypothesis analysis using a Leica MZ12 stereomicroscope at 10 x - 100 x magnification. Visualizations of topographic/depth changes including manual areas staining thermal discoloration and dips, the corer was modified along predefined grid cuts. SEM analysis was used to differentiate shells and thermal modifications. The focus of this poster is on the pattern of thermal discoloration between samples from above, below and within the borehole.

See also [The 10 biggest mistakes](#)  
when [managing](#) a [new product](#)



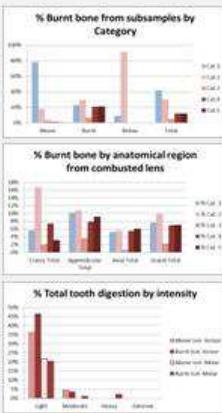
### Results

Assuming scavenging prior to fire, the thermal alteration of the burnt layer, as hypothesised, that small mammal bones deposited within the burnt layer will have a higher proportion of thermal alteration, as well as a higher frequency of bone modification, than those deposited above or below the burnt layer. Carbonation evaluation of the 1000 mln. faunal remains at temperatures >400°C, generally exceeding natural fire temperatures (Lyman, 2009). Of the 2,791 bones examined, 382 (13%) yielded evidence of thermal alteration or destruction of the bone surface. The majority of these specimens (~70%) fall into Cat. 1 (highly改変された骨) and Cat. 2 (partially改変された骨). The remaining 30% exhibited no carbonation (Cat. 3) or carbonation + grey-white (Cat. 4) or yellow white (Cat. 5) colour. These categories were also found to be non-randomly distributed in Cat. 1 and 2, without cracking and less so in Cat. 3.

Although the benthic foraminifera of specimens are often Cat. 1 (MSP = 17.5%) or Cat. 2 (MSP = 40%), a large 41.6% (MSP = 9) of the material from these deposits is designated Cat. 3 or higher. The sample moves from below the benthic forams to a small, discrete band (MSP = 14.1, MINI = 3), however, the benthic forams remain the clear dominance of Cat. 2 dissolution. From the benthic layer, the distribution is bimodal with Cat. 3-5 accounting for 48.1% (MSP = 16.3) of the benthic specimens or 34.4% of the total benthic specimen from these core sections. Despite the small sample size, a clear pattern in the distribution of benthic forams in the upper portion of the deposit is seen.

The size distribution of each taxon of benthos across anatomical zones suggest that these modifications are uniform in all exposure to high temperature. Benthic response to high temperature among basal elements suggest human man is instrumental in the assembly (Devar & Jardine, 2007). The majority of depth distribution can indicate what predators is responsible for benthic accumulation of small/mammal benthos (Andrews, 1998). The dominance of light size in the distribution/light reduction of faecal and faeces of aldered age, in both biomass and molar, suggest the small/mammal accumulation from Cura Negra was accumulated by a Catagly 1 or 2 predator-most likely a heron who caught it.

Both burnt and unburnt specimens show uptake of the deposit by the walls of mineral veins, staining. To differentiate between the first and thermal alteration type, *pumicite* was examined using SEM and  $\mu$ -XRD and a mineral analysis (HRD). While no clear visual distinction was seen, suggesting the mineral deposit extend below the central part of the deposit, a bright pocket of Manganese (Mn) and Iron (Fe) deposit, no go grade, was once stained by acid solution. HRD on type *pumicite* from all fine can give rise of burning when heat these mineral as the agent behind the dissolution, supporting our visual identification of the mineralization.



### **Conclusions**

The small mammal collection from Cueva de la Gra in itself clearly shows a anthropogenic burning event deep within the cave deposit. The occurrence of carbonized and calcined bone indicates temperature exceeding those commonly reached by natural fires, and the ergosterol of 94.8% of the recovered calcined bone within a thin stratigraphic level suggests these bones were heated both directly and indirectly. The anatomical pattern of the mammal fauna, as well as light digestion of the skeletons, suggests the assemblage was accumulated by birds of prey, and that the specimens were unintentionally damaged by human-controlled fire. The mammal remains, similar interpretation is based on animal life, and micro-morphological evidence and present a small methodology for identifying early pre-historical faunal capabilities in the archaeological record.

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### Acknowledgements

Graduate student research assistant at the Institute for Computational Neuroscience and Department of Mathematics at the University of Colorado Boulder. Her research interests include the development of mathematical models of brain function, particularly in the context of learning and memory.

# **BRIEFING YOU**

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# RESEARCH PLAN

## THE PROJECT AND ITS RESEARCH GOALS

The Project aims at achieving careful recovery, by scientific excavation, of skeletal remains of Neanderthal folk and their Palaeolithic stone tools and extinct animal remains, from between about 900,000 and 40,000 years ago, at the 2 southeastern Spanish sites in the province of Murcia of

**CUEVA NEGRA** ("Black Cave") in the River Quípar gorge at La Encarnación near Caravaca de la Cruz (900,000-800,000 years ago), and **SIMA DE LAS PALOMAS** ("Hole of the Doves") on Cabezo Gordo hill at Dolores de Pacheco near Torre Pacheco (130,000-40,000 years ago).

The Project is allowing full recovery of these materials to be used to draw comparisons and contrasts between findings at the site near the coast of *Sima de las Palomas* and those at the much earlier site in the inland hill-country of *Cueva Negra*. This throws much-needed light on the exploitation of natural resources by Neanderthal folk (*H. neanderthalensis*) and their even more archaic fore-runners (*H. heidelbergensis*) in two very different local environments 100 kilometres apart.

*Sima de las Palomas* overlooks the coastal plain behind a large coastal lagoon known as the *Mar Menor* ("Lesser Sea") from about 125 metres above sea level. It is therefore in a mild environment, where people could have lived throughout the year during the ice age. By contrast, *Cueva Negra* is at 740 metres above sea-level where the *River Quípar* emerges from a rocky gorge ("Estrecho del Río Quípar") overlooked by mountains rising to 1,500 metres above sea-level; it is only 30 kilometres from peaks which tower to over 2,000 metres. In ice-age times its environment was uninhabitable by man for much of the year.

## OUR FINDINGS HELP TO FORMULATE PUBLIC POLICY WITH BENEFITS FOR THE TOURIST INDUSTRY AND LOCAL BUSINESS:

Our field research has led to development of regional public policy with the following outcome.

### **OPENING SOON: MURCIA MUSEUM FOR PALAEONTOLOGY AND HUMAN EVOLUTION (MUPEH, Museo de Palaeontología y Evolución Humana)**

This imposing, new, purpose-built 5-storey museum has been erected by the Murcian Regional Government and Torre Pacheco township, below Sima de las Palomas, at the foot of Cabezo Gordo, but it still has to be fitted out (with luck in 2018). We accompanied our regional Minister for Culture together with its famous architect, Federico Soriano, who showed us around in January 2013. It has exhibition floors as well as workshops and laboratories, and even residential accommodation and a restaurant, as well as an auditorium. Our Sima de las Palomas Neanderthals will be the highlight of the display, naturally! The museum has been built thanks to our Sima de las Palomas finds which it will house, and we have been behind its establishment from the beginning. It is taking several years to come to fruition, alas. The museum is near the coastal resorts of the Mar Menor and therefore will be an important focus for cultural tourism. Because we are in a tourist area with hundreds of thousands of European Union summer visitors every year, our findings will reach a very wide international public indeed. Many local businesses have been involved in the construction and will be involved in its furbishment and maintenance.

## BACKGROUND AND SIGNIFICANCE OF THE PROJECT

### ***Electronic snapshots of our sites:***

Two short articles about our sites in the e-journal ***PopularArchaeology*** are on the web, and you might like to look at them: M.J.Walker, M.López Martínez, M.Haber Uriarte, "The Cueva Negra del Estrecho del Río Quípar: a 0.8 Ma site with human and Palaeolithic remains in SE Spain," *Popular Archaeology* 15 06052014 July 2014 ([e-journal](#)).

M.J.Walker, M.López Martínez, M.Haber Uriarte, "The Sima de las Palomas del Cabezo Gordo: Neanderthal burials from 50,000 years ago in SE Spain," *Popular Archaeology* 15 06052014 July 2014 ([e-journal](#)).

Two short chapters in the e-book ***Pleistocene and Holocene Hunter-Gatherers in Iberia and the Gibraltar Strait*** are: M.J.Walker, M. López Martínez, M. Haber Uriarte, 2014.; "Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain)" Pp. 372-379 in R. Sala Ramos ed, with coordinators E. Carbonell, J.M.Bermúdez de Castro and J.L.Arsuaga) ***Pleistocene and Holocene Hunter-Gatherers in Iberia and the Gibraltar Strait: The Current Archaeological Record***. (Burgos, Universidad de Burgos and Fundación Atapuerca, ISBN 9788492681, available as [e-book](#) 9788492681884).

M.J.Walker, M. López Martínez, M. Haber Uriarte,:2014, "Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)" Pp. 410-413 in R. Sala Ramos ed, with coordinators E. Carbonell, J.M.Bermúdez de Castro and J.L.Arsuaga) ***Pleistocene and Holocene Hunter-Gatherers in Iberia and the Gibraltar Strait: The Current Archaeological Record***. (Burgos, Universidad de Burgos and Fundación Atapuerca, ISBN 9788492681, available as [e-book](#) 9788492681884).

The manuscript of a semi-popular book was delivered in October 2015 to the editor, Claire Litt, of Oxford's Oxbow Books, with a view to its publication during 2018, with the following title: *How the Earliest Cave-Folk of South-East Spain were Dug Up. A journey full of archaeological and anthropological surprises. A book put together by the team excavating under the direction of Michael J. Walker at the sites of Cueva Negra del Estrecho del Rio Quípar (the Black Cave of the River Quípar gorge) near Caravaca de la Cruz, Murcia, Spain, and Sima de las Palomas del Cabezo Gordo (Dove Hole on Cabezo Gordo hill) near Torre Pacheco, Murcia, Spain.*

## **Introduction**

**Michael Walker** writes: I was keen to extend knowledge about Neanderthal presence in southeastern Spain following my appointment there as Professor of Physical Anthropology at Murcia University in 1988. I had come to Murcia from Sydney University in Australia, from where I had already carried out research into both the southeastern Spanish Quaternary (e.g. Cuenca & Walker 1986 and refs.; Cuenca, Pomery & Walker, 1986, and refs.) and Neanderthal origins (Habgood & Walker 1986), and supervised Phil Habgood's exhaustive PhD thesis *A Morphometric Investigation into the Origin(s) of Anatomically Modern Humans* (published in the British Archaeological Reports International Series, BAR S-1176, 2003). (For other references, see *Reading Suggestions*.)

### **CUEVA NEGRA DEL ESTRECHO DEL RÍO QUÍPAR**

I therefore lost no time in accepting an offer in 1985 to visit *Cueva Negra* made by my friend Miguel San Nicolás, a Spanish prehistorian, who had dug a 2 metre-deep test pit there in 1981 and found possible "Mousterian" stone tools, and extinct animals such as rhinoceros (Martinez et al., 1989). Apart from that test pit, no further work had been done there.

No sooner did I see the test pit, than I at once recognized something that the young archaeologist had not, but which my previous research in southeastern Spain had taught me to recognize easily - namely, that it was dug through a sediment laid down by the nearby river when it reached the cave from time to time, sediment which also included minerals derived from the rock of the cave walls and roof, and even a small amount of very fine wind-blown soil (known as *loess*) which must have been blown onto long-vanished swamps in front of the cave, on the River Quípar flood-plain, by fierce winds which whipped up enormous amounts of dust from the barren landscapes of the Sierra Nevada 200 kilometres to the south (where small glaciers still lingered), and which probably extended northwards at altitudes of over 1,000 metres above sea level near to the cave. The sedimentary fill of *Cueva Negra* (5 metres deep at the back of the cave, perhaps 8 at the front) was deposited by the River Quípar (a tributary of the River Segura which reaches the Mediterranean Sea 110 kilometres East of our site, though the cave is only 75 kilometres, as the crow flies, from the Mediterranean coast of southern Murcia). Swamps and lakes watered by the Quípar sporadically reached the cave at a time when the Quípar flood-plain stood close to the level of the cave.

Earlier research, backed up by radiocarbon dating, had shown that the 3 river terraces of the Segura river basin may have been formed somewhat more recently than was once thought to be the case. The *lowest* terrace began accumulating only about 30,000 years ago when the last major cold stage of the last ice-age began, and after the *middle* terrace had stopped accumulating, around 40,000 years ago at the end of the middle stage of the last ice-age. The last ice age ended about 12,000 years ago (when the Holocene period began). It had begun about 80,000 years ago. The last ice age and the preceding temperate conditions of the last interglacial period (Marine Isotope Stage MIS-5, which began about 128,000 years ago) comprise the Late Pleistocene (formerly called the Upper Pleistocene). Before 40,000 years ago Neanderthal folk and "Mousterian" stone tools predominated throughout Europe. It seemed plausible that excavation at *Cueva Negra* might uncover more of them. The basis of our conjecture was wrong!

As we shall see, things have now turned out to be very different indeed, and far more surprising –nay, astonishing!– than I had ever imagined, and certainly very exciting for our understanding of early Palaeolithic archaeology in Eurasia. To cut a long story short, we know now that the sediments in *Cueva Negra* were laid down far, far earlier than I had (wrongly) imagined - namely, at a time between 990,000 and 780,000 years ago (0.99-0.78 Ma, million years ago): that is to say, at the end of the Early (or Lower) Pleistocene, and just before the start of the Middle Pleistocene 780,000 years ago (0.78 Ma). Of course, this was long, long before the last ice age; in fact six or seven ice ages had come and gone since *Cueva Negra* was frequented by early humans - probably an extinct fossil human called *Homo heidelbergensis* from whom *Homo neanderthalensis* was descended. *Cueva Negra*'s Palaeolithic "Levalloisian-type" chert flakes, some of which have edges modified by steep "Mousterian" or "Mousteroid" retouch, are among the oldest of this kind in Europe, and were accompanied by a bifacially-flaked "Acheulian" hand-axe on a limestone cobble. Moreover, that the sediments contain the oldest evidence of fire at any Palaeolithic site in Europe! In short, the sediment had been laid down in the cave long, long before nearby river terraces came into existence, and it was protected for posterity by tectonic uplift of the hillside in which *Cueva Negra* lies. More of all that later on!

But let me begin at the beginning. The project got under way when I started to excavate *Cueva Negra* in 1990. Since then I and my team have excavated there during three weeks every year. The excavations are carried out under the auspices of the annual Field School of the **Murcian Association for the Study of Palaeoanthropology and the Quaternary, MUPANTQUAT** (<http://www.mupantquat.com>), and co-directed by myself and my Spanish archaeologist friends here at Murcia, **Mariano López-Martínez** and **María Haber-Uriarte** who lectures in Prehistoric Archaeology at Murcia University.

The prehistoric fauna at *Cueva Negra* includes remains of elephant (mammoth), rhinoceros, hyaena, bear, monkey (macaque), wild cattle, bison, wild horse, ibex, extinct giant deer, red deer, fallow deer, lynx, fox, rabbit, pika, tortoise, and over 60 different bird species. Several of these animals are, of course, no longer found in Western Europe nowadays. Of exceptional importance is presence of extinct Rodents (some of which were well and truly extinct long before 700,000 years ago, 0.7 Ma) which are being studied by Murcia University biologist Antonio López Jiménez whom you will probably see a lot during the 2018 field season: especially, the fossil Arvicoline voles *Microtus (Victoriomys/Allophaiomys) chalinei*, *Microtus (Mimomys savini)*, *Microtus (Stenocranius) gregaloides*, *Microtus (Terricola)arvalidens*, *Pliomys episcopalidis*, and other extinct rodents include a fossil, *Cricetulus (Allocricetus) bursae*, whilst lagomorphs include an early form of rabbit and also the pika, *Prolagus calensis*, which also became extinct in Spain during the Middle Pleistocene. Pollen analysis conducted by Professor José Carrión of Murcia University points to benign damp temperate conditions.

The fossil rodents imply that the sediment in the cave was laid down by the start of the Middle Pleistocene, mostly towards the close of the Early Pleistocene 900,000-800,000 years ago (0.9-0.8 Ma). At Oxford University Dr Jean-Luc Schwenninger heads the Optical Sediment Luminescence Laboratory at the renowned Research Laboratory for Archaeology and the History of Art (RLAHA). He has visited *Cueva Negra* several times to take sediment samples and measure background radiation with a portable gamma-ray spectrometer, in order to estimate the age of the sedimentary deposit using the method known as optically stimulated sediment luminescence dating. It indicates an antiquity of greater than half-a-million years ago. In 2015 his research student Mariana Sontag-Gonzalez took samples at *Cueva Negra* for him during our field season, which he is continuing to analyse.

Sediment samples also were taken at *Cueva Negra* for palaeomagnetic research by Drs Gary Scott and Lluis Gibert from the Berkeley Geochronology Center. Their research on the magnetostratigraphy demonstrates that the entire 5-m depth of Pleistocene sediment belongs to the Matuyama magnetochron of reverse magnetic polarity, and therefore must predate the palaeomagnetic change 780,000 years ago (0.78 Ma) to normal polarity that characterizes the Brunhes magnetochron. Although the Matuyama magnetochron commenced over 2,500,000 years ago (2.5 Ma), it was interrupted by short reversals characterized by normal polarity, one of which (the Jaramillo reversal) lasted between 1,100,000 and 990,000 years ago (1.1-0.99 Ma). The fossil Rodent biochronology suggests an antiquity no greater than one million years ago. It is therefore probable that the entire depth of sedimentary fill is no older than 990,000 years ago and no younger than 780,000. Both pollen and fauna testify to benign damp environmental conditions, probably corresponding to one of the three interglacial periods that are known to have occurred between 780,000 and 990,000 years ago (0.78-0.99 Ma), numbered as Marine Isotope Stages MIS-21, MIS-23, and MIS-25, very likely the latest of these, MIS-21, ca. **865,000-815,000** years ago (0.865-0.815 Ma).

Among the large mammalian fauna, an Early Pleistocene horse is represented by a characteristic tooth that the distinguished Dutch palaeontologist Dr Jan van der Made, who works at Madrid's Natural Science Museum, considers to belong to *Equus altidens*, as had been suggested by the Barcelona palaeontologist, the late Dr Josep Gibert. An almost complete rhino skull and mandible belonging to a young rhinoceros (*Stephanorhinus etruscus*) were excavated in 1994, a larger rhino mandible in 1997, as well as a large fragment at a very great depth in our test-pit (metre-square C2a) of a third in 2000, and a magnificent set of extinct giant deer (*Megaloceros* sp.) antlers was excavated in 1995; Dr Van der Made considers it likely that it represents a new species from which two Middle Pleistocene lineages evolved in Europe, *Megaloceros novocarthaginiensis*. He has identified also remains of the extinct fallow deer *Dama vallonnetensis*, a late Early Pleistocene species. A bison horn-core of the extinct *Bison voigstediensis* and part of a macaque (cf. *Macaca sylvanus*) upper jaw, as well as a bear tooth and part of a hyaenid mandible, are among the large faunal remains. An elephantid mandible fragment, excavated in 1993 at *Cueva Negra*, is possibly of *Mammuthus meridionalis*, which was the main fossil species that lived in Spain and southern Europe 800,000 years ago (0.8 Ma). Altogether, from 1990-2017, *Cueva Negra* has provided us with over 18,000 items that represent skeletal fragments of mammals, around over 5,000 of birds, and over 2,500 of reptiles, especially tortoise (which is mainly the extinct *Eurotestudo hermanni*, according to palaeontologist Dr Xaber Murélaga of the University of the Basque Country who has studied our collection). There is a very large number of splinters and fragments, several of which may turn out to be classifiable on further study by specialists in particular areas of comparative vertebrate anatomy and palaeontology; these splinters and fragments amount to 20,000 items.

Murcia University's Professor of Plant Evolution, Dr José Carrión, has identified pollen in soil at our site of species which include both evergreen and deciduous oaks (such as *Quercus faginea*) and some other broad-leaved trees, pointing to greater availability of surface water and benign temperate conditions: see J.S.Carrión et al., 2003, *Global Ecology and Biogeography* 12: 119-129 - when the manuscript was sent to the journal we had conjectured, in the absence of clear chronological evidence to the contrary, that the **Cueva Negra** sedimentary fill belonged to a time no older than 50,000-150,000 years ago, which is reflected in the published article though the palaeoenvironmental results are certainly compatible with the much greater antiquity that has been demonstrated since then.

British avian palaeontologist Anne Eastham has identified over 60 bird species at *Cueva Negra*, including diving ducks, waders, and other waterfowl which point to former lakes in what today are rather dry river valleys in which rivers are little more than small streams. Other birds, such as jays and woodpigeons, eat acorns, and they hinted at presence of oaks even before their pollen was identified by José Carrión. Yet other birds such as larks and plovers show that there were also wide areas of open country near the site. In short, the site was located conveniently for exploiting resources present in different local environments quite close to hand, from wetlands with stands of broad-leaved trees, to parkland where open spaces were interspersed with stands of woodland, and open rough steppe with stands of pines and other conifers, and finally steep hillsides with crags and mountainsides.

The Palaeolithic assemblage is represented at *Cueva Negra* by over 1,700 classifiable pieces (of which more than half are struck flakes without retouch) and several thousand fragments and spalls, found by us over the period 1990-2017. Most of it is made from poor quality chert, quartzite, limestone and marble; cobbles of these were taken to the cave by *Homo heidelbergensis*. Since 2004 we have excavated some fine examples of the "Levalloisian-type" hierarchical core-reduction technique of preparing flint flakes, in deep layers close to where we had excavated the "Acheulian" bifacially-flaked hand-axe, in 2003. These layers also have small stone tools with steep abrupt Mousterian retouch. It is very exciting that an "Acheulo-Levalloiso-Mousteroid" industry was present ca. 800,000 years ago because it shows conclusively that all three kinds of Palaeolithic stone-tool preparation formed part of a single tradition from the end of the Early Pleistocene in Europe.

One very important source of raw materials for making stone artifacts was an outcrop of conglomerate 800 metres (half a mile) away from *Cueva Negra*. The outcrop represents a fossil shingle beach of the shore of the Miocene *Tethys Sea*, which, millions of years ago, in the Tertiary geological era, stretched from the Atlantic Ocean across what is now the Mediterranean Sea and eastwards to what is now the Persian Gulf. The pebbles and cobbles at the outcrop include flint, chert, Jurassic limestone and quartzite. None of these occur in the rock walls or roof of *Cueva Negra*, which are somewhat later Miocene biocalcareous rock. Our identification of the nearby local rock source was greatly enhanced in 2011 thanks to collaboration at Arizona University, where recent anthropology graduate Winston Zack, who spent three field seasons here, submitted many samples he took, from both the site itself and chert outcrops in its vicinity, to Dr Alex Andronikov at AU's Lunar and Planetary Sciences Laboratory who has conducted spectroscopic analysis of rare-earth trace elements in the cherts (see W.Zack, A.Andronikov, T.Rodríguez-Estrella, M.López-Martínez, M.Haber Uriarte, V.Holiday, D.Lauretta, M.J.Walker, 2013, "Stone procurement and transport at the late Early Pleistocene site of *Cueva Negra del Estrecho del Río Quípar* (Murcia, SE Spain)" *Quartär, Internationales Jahrbuch zur Eiszeitalter- und Steinzeitforschung, International Yearbook for Ice Age and Stone Age Research* 60: 7-28, ISSN: 0375-7471).

At the conglomerate outcrop, we have picked up a typical waste end-product (a small "Levallois-type" core) which is what was left over after early humans had removed from a pebble here several flint flakes for use as everyday cutting, scraping, or piercing tools. At *Cueva Negra* in 2016 we excavated another similar chert core. Both cores are demonstrate *hierarchical* knapping, by which small flakes are removed to prepare a discoidal core such that the angle they make with its major surface favours subsequent (hence "*hierarchical*") removal from it of a larger flake the shape of which can be controlled and perhaps be regular in form (e.g., oval, triangular, oblong). We have also picked up on the conglomerate outcrop small retouched Palaeolithic implements including a small scraper similar to others

excavated at Cueva Negra. Another small discoidal core, this time of limestone, was also found near the mouth of *Cueva Negra*. Up to now, small discoidal cores (even those with minimal peripheral prepared facetting) had not been found that date from before 300,000-400,000 years ago (0.3-0.4 Ma) in Europe and the Near East. At *Cueva Negra* our excavations show that flakes removed from such cores are present in deep layers that are very much older and the excavation in them of a discoidal chert core in 2016 confirms their antiquity. Of special interest at *Cueva Negra* are finds of 3 possible "soft" hammers, or soft knapping billets which were used for knapping stone delicately and made from the butts and pedicles of the antlers of deer. In 2016 we excavated a fragment of an animal long bone bearing a pock-marked rough area on its surface, which is typical of a bone retoucher used for the secondary knapping of stone artifacts.

Who made the stone tools? Neanderthal ancestors ("pre-Neanderthal" humans) roamed Spain and left abundant skeletal remains in the Sierra de Atapuerca near Burgos in northern Spain, notably in a cave called the Sima de los Huesos where they have been dated to ca. 425,000 years ago (0.425 Ma, million years ago). Even older human remains come from the Sima del Elefante at Atapuerca, dating from about 1,200,000 years ago (1.2 Ma). These "pre-Neanderthal" humans are called often *Homo heidelbergensis* in honour of a human mandible found in Germany near Heidelberg over one hundred years ago and which dates from about 600,000 years ago (0.6 Ma). Other Atapuerca caves that have yielded up older human remains, including some that are at least as old as *Cueva Negra* (the name *Homo antecessor* has been given to some). At one time we thought some teeth from *Cueva Negra* could be "pre-Neanderthal" but lately we have become rather sceptical because of their similarity also to front teeth of an extinct bear species that lived 800,000 years ago, 0.8 Ma (*Ursus deningeri*) females had some front teeth as small as and not unlike those of Neanderthal humans); the matter is under investigation.

Since 2004 we have excavated some splendid flakes produced by the aforementioned hierarchical core-reduction technique that involves repetitive centripetal ("Levalloisian-type") removal of flakes from cores that have undergone previous knapping to prepare into the shape of a small disc. The flakes came from layers close to where in 2003 we had excavated an "Acheulian" hand-axe, a bifacial core tool that had been made by removing flakes from both faces of an almond-shaped core which once had been a large limestone cobble or pebble. The two core-reduction methods have opposite outcomes. The first produces flakes to be used as tools, by controlled removal of flakes of triangular, oval or oblong shapes (sometimes the cutting or scraping edge is strengthened by retouch), until the core becomes too small for removal of any more flakes and is thrown away as waste. By contrast, the second fashions a tool out of a large core "hierarchically", by removing flakes preparatory to removing another usually larger flake, the shape of which can be controlled by the method.

It is extremely gratifying to be able to show presence of two very different knapping techniques at such great depth. Our 2003 campaign at *Cueva Negra* had concentrated on an area adjoining that in which our 2001 excavation of a 3x1 metre area explored a consistent Palaeolithic living surface with remnants of stone knapping, broken bone fragments, and other débris. It lay at an intermediate depth with regard to the levels that previously had been defined at the site, but probably it had not been encountered during earlier campaigns that went deeper because where those excavations took place there had been a massive slab of rock that had fallen from the roof during the Pleistocene and occupied most of the area behind where we had identified the living surface in 2001. In 2003 we began to excavate an adjacent 3x1 metre area, culminating in the astonishing excavation of an "Acheulian" hand-axe, and the excavation in 2004 of well-made chert flakes that had been produced by repetitive centripetal ("Levalloisian-type") flaking of small prepared chert cores confirmed the extent of an important activity area.

The hand-axe had lost its tip in antiquity, no doubt through (mis)use. A remarkable aspect of the artifact is that it was made by bifacial working of a flat cobble of local limestone, not chert, probably got from a nearby outcrop of conglomerate mentioned earlier. The spectacular find brought into perspective two matters that had concerned us previously: first, the widespread evidence for knapping of limestone at *Cueva Negra* (spalls and chips, flakes, retouched pieces, and perhaps the disc core mentioned earlier), and, secondly, a hitherto puzzling singular find of a flat limestone cobble with bifacial retouch in the shape of a chopping-tool of "pick"-like form, that may have been an unfinished hand-axe, excavated in the same level of an adjoining square in 2001.

The significance of the coexistence of "Acheulian", "Levalloisian-type" and "Mousteroid" techniques of stone artifact preparation is that it gives support to Southampton University's Professor Clive Gamble who has stressed the importance of the coexistence in Europe, from half-a-million years ago, both of assemblages comprising large numbers of bifacially-flaked core-tools, and assemblages of retouched flake tools, and has posed a crucial matter for archaeologists to consider from the viewpoint of alternative core-reduction sequences (the French call them *chaînes opératoires*) of Palaeolithic knappers: "*With the chaîne opératoire we now have the methodological tools and a conceptual model for moving the debate onto the productive pastures of hominin involvement with their taskscapes. For example, were these taskscape skills merely those of tool assisted hominins ... or are we dealing with more sophisticated capabilities comparable in many respects to modern humans ...?*" (Gamble, C.S., 1999, *The Palaeolithic Societies of Europe*, Cambridge University Press, p. 138).

Put another way, did, in Europe, those Pleistocene "pre-Neanderthal" (*H. heidelbergensis*) forerunners of Neanderthals behave in so very similar a fashion to Pleistocene *H. heidelbergensis* forerunners in Africa of anatomically-modern *H. sapiens*, such that (a) Neanderthals might best be regarded as *H. sapiens neanderthalensis* (rather than *Homo neanderthalensis*, though anatomically-speaking there is nothing wrong with *H. neanderthalensis* and I often use it) and (b) both they and anatomically-modern *H. sapiens* ought to be regarded as evolutionary descendants of a common Afro-European *H. heidelbergensis* which was wholly comparable and commensurable throughout as regards not only skeletal anatomy, but also behaviour - in so far as this is demonstrated by the ease with which they were able to follow alternative reduction sequences in knapping stone obtained locally at *Cueva Negra*, namely, a bifacial reduction-sequence of cores into bifacially-flaked core tools such as Acheulian hand-axes, and preparation of small discoidal cores on which repetitive flaking reduced these further still, in order to remove flakes, of predetermined size and shape, for subsequent Mousteroid steep edge-retouch into flake-tools such as scrapers or points?

I have attempted to get to grips with this aspect of cognitive evolution 800,000 years ago at *Cueva Negra* in two recent books, namely, *Palaeolithic Pioneers, Behaviour, Abilities, and Activity of Early Homo in European Landscapes around the Western Mediterranean Basin ~1.3-0.05 Ma* (2017, Archaeopress, Oxford, UK; ISBN 9781784916206. e-book ISBN 9781784916213), and (Chapter 4) in H.M.Manrique and M.J.Walker, *Early Evolution of Human Memory: Great Apes, Tool-making, and Cognition* (2017, "Palgrave Pivot", Palgrave Macmillan - Springer Nature, New York, ISBN 9783319644462, e-book ISBN 9783319644479). Mention was made also in "Chapter 7. Long-term memory and Middle Pleistocene 'Mysterians'", pp. 75-84 in S.A.de Beaune, F.L.Coolidge &

T.Wynn (eds), *Cognitive Archaeology and Human Evolution* (2009, Cambridge and New York, Cambridge University Press, ISBN 0521746116). The book includes papers presented at a colloquium on cognitive evolution during the XV Congress of the International Union of Prehistoric and Protohistoric Sciences at Lisbon in 2006. Tom Wynn is Professor of Anthropology at the University of Colorado at Colorado Springs where Fred Coolidge is Professor of Psychology, and together they have written many articles about Palaeolithic technology and cognitive evolution as well as the books *The Rise of Homo Sapiens* published in 2009 by Wiley-Blackwell and *How to Think like a Neandertal* published in 2012 by Oxford University Press, and Sophie de Beaune is a prehistorian at the University of Lyons who also has published in the same area. I have dealt with the matter also in recent scientific articles (see: M.J.Walker, M.V.López-Martínez, J.S.Carrón-García, T.Rodríguez-Estrella, M.San-Nicolás-del-Toro, J-L.Schwenninger, A.López-Jiménez, J.Ortega-Rodrigáñez, M.Haber-Uriarte, J-L.Polo-Camacho, J.García-Torres, M.Campillo-Boj, A.Avilés-Fernández, W.Zack, 2013, "Cueva Negra del Estrecho del Río Quípar (Murcia, Spain): A late Early Pleistocene hominin site with an "Acheulo-Levalloiso-Mousteroid" Palaeolithic assemblage" *Quaternary International* 294, pp. 135-159, ISSN 1040-6182).

A rigorous "modal" approach to stone tools has been published by Professor John Shea of New York University at Stony Brook (Shea, J.J., 2016, *Stone tools in human evolution*, Cambridge University Press, and 2013 "Lithic Modes A-I: A new framework for describing global-scale variation in stone tool technology illustrated with evidence from the East Mediterranean Levant", *Journal of Archaeological Method and Theory* vol. 20, pp. 151-186). This has led us to try to apply to *Cueva Negra* his scheme for interpreting stone artifacts, and to abandon terms such as "Acheulian", "Levalloisian" and "Mousterian" altogether; see our article – we can send you a pdf - in the journal *Human Evolution* vol. 31, pp.1-67, 2016 (ISSN 0393-9375), "A view from a cave: Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, southeastern Spain). Reflections on fire, technological diversity, environmental exploitation, and palaeoanthropological approaches" by M.J. Walker, D. Anesin, D.E. Angelucci, A. Avilés-Fernández, F. Berna, A.T. Buitrago-López, J.S. Carrón, A. Eastham, S. Fernández-Jiménez, J. García-Torres, M. Haber-Uriarte, A. López-Jiménez, M.V. López-Martínez, I. Martín-Lerma, J. Ortega-Rodrigáñez, J.L. Polo-Camacho, S.E. Rhodes, D. Richter, T. Rodríguez-Estrella, G. Romero-Sánchez, M. San-Nicolás-del-Toro, J-L. Schwenninger, A.R. Skinner, J. van-der-Made, and W. Zack: If you come to our 2018 Field School we shall explain this approach to you. (Our 2016 paper has greatly improved on our 2014 oral presentation "Hominin activities ~0.8 Ma at Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, SE Spain): Fire, technological diversity, environmental exploitation" by M.J.Walker, D.Anesin, D.Angelucci, A.Avilés-Fernández, F.Berna, A.T.Buitrago-López, J.S.Carrón-García, A.Eastham, S.Fernández-Jiménez, J.García-Torres, M.Haber-Uriarte, A.López-Jiménez, M.V.López-Martínez, I.Martín-Lerma, J.Ortega-Rodrigáñez, J.L.Polo-Camacho, S.E.Rhodes, D.Richter, T.Rodríguez-Estrella, G.Romero-Sánchez, M.San-Nicolás-del-Toro, J-L.Schwenninger, G.R.Scott, A.Skinner, J.van der Made, W.Zack, 2014; page 31 in Abstracts 2014 Burgos 1-7 Sept UISPP Union Internationale des Sciences Préhistoriques et Protohistoriques, XVII World UISPP Congress, XVII Congrès Mondiale de l'UISPP, XVII Congreso Mundial de UISPP.)

Neither the complexity nor the antiquity of our *Cueva Negra* tool-kit need come as a complete surprise. In Africa, the "Levalloisian-type" core-reduction technique goes back to 1,400,000 years ago (see I. de La Torre, R.Mora, M.Domínguez-Rodrigo, L. de Luque & L. Alcalá, 2003: "The Oldowan industry of Peninj and its bearing on the reconstruction of the technological skills of Lower Pleistocene hominids", *Journal of Human Evolution*, 44, pp. 203-224). In Africa, reduction of stone to fashion hand-axes goes back as far as 1,700,000 years ago (1.7 Ma). Both types of reduction imply cognition of imaginary secant planes that divide volumes, symmetrically in the case of bifacial hand-axe fashioning, but asymmetrically in the case of Levalloisian disc cores such that the major volume could be knapped in a way that in the end "released", so to speak, the flake of intended shape to be removed from within it (Tom Wynn has written that this is the most demanding and complex of all reduction-sequences ever developed). It tells us much about the evolutionary significance of early human cognitive awareness that probably lay behind the dispersal of *Homo* out of Africa and throughout Eurasia before 1,500,000 years ago (1.5 Ma).

Our 2011 season's astounding discovery of traces of ancient fire lying deeply within the cave sediments confirms the ability of humans to survive in higher latitudes than those of equatorial Africa where their ancestors originally had evolved between 4 and 2 million years ago. The 2012, 2013, 2014, 2015, 2016 and 2017 field seasons have extended our findings. By the end of the 2017 field season we had extended to about 5 m<sup>2</sup> the surface affected by combustion and further extension will be undertaken in the 2018 season. Fire allowed our ancestors to keep warm at night and wild animals at bay, but especially to cook food and thereby enhance rapid absorption of nutrients so necessary for physiological metabolic processes in the body and especially the brain. Ours is the oldest firm evidence for fire at a Palaeolithic site outside Africa (where it is found at sites going back to before 1,000,000 years ago, 1 Ma). We have found many fragments of charred and even calcined bone. Some calcined long-bone fragments had undergone length-wise splintering which occurs when heat has volatilized the organic components of bone which then shrinks and cracks open. We also have excavated several spalls of burnt chert and a spectacular lump that had exploded owing to thermal shock which was uncovered with the resulting razor-sharp splinters still in place like the petals of a rose.

The evidence for fire at such an early European site as *Cueva Negra* is arousing great interest and a major scholarly article "Combustion at the late Early Pleistocene Palaeolithic site of Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain)" was published in June 2016 in the prestigious British archaeological journal *Antiquity* vol. 90 pp. 571-589 (founded in 1927 and published every two months by Cambridge University press). An early version of this paper was presented orally in 2014 at Burgos 1-7 Sept UISPP Union Internationale des Sciences Préhistoriques et Protohistoriques, XVII World UISPP Congress, XVII Congrès Mondiale de l'UISPP, XVII Congreso Mundial de UISPP.

The temperature of the fire had reached 550°C, according to spectrometry analyses of the burnt bone and chert, which have been undertaken by Dr Daniel Richter using thermoluminescence methods at Leipzig's Max-Planck Institute for Evolutionary Anthropology, Dr Anne Skinner at Boston's Williams College using electron spin resonance methods, and Dr Francesco Berna at Simon Fraser University using Fourier-transform infra-red techniques with which he carried out postdoctoral research at Boston University under the guidance of the distinguished geoarchaeologist Professor Paul Goldberg who developed the method there. Dr Berna's friend, geoarchaeologist Dr Diego Angelucci of the Italian University of Trento, has studied the micromorphology of thin sections he took at *Cueva Negra* with his PhD student Daniela Anesin (D.Angelucci, D.Anesin, M.López-Martínez, M.Haber-Uriarte, T.Rodríguez-Estrella, M.J.Walker, 2013, "Rethinking stratigraphy and site formation of the Pleistocene deposit at Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Spain)" *Quaternary Science Reviews* 89, 195-199 ISSN: 0277-3791). Our Murcian MUPANTQUAT scientists also have conducted relevant research. Chemical and mineral research consistent with combustion of sediment was undertaken by geology Professor Tomás Rodríguez-Estrella of the Cartagena Polytechnic University, and microscopical

inspection of chert from the layer indicates exposure to heat according to archaeological use-wear specialist Dr. Ignacio Marín-Lerma of Murcia University.

Sara Rhodes is a Canadian who has carried out a study of burnt and unburnt small mammal bones using scanning electron microscopy and energy dispersive spectrometry together with Spanish taphonomist Dr Yolanda Fernández-Jalvo (CSIC, Madrid) in order to demonstrate that dark colour of several burnt bones owes to charring and not to mineral staining. Sara excavated with us in 2011, 2012 and 2013 when she was studying for her Master's degree at Toronto University; she is now in Germany, having taken up a well-deserved German government scholarship to do a PhD on taphonomical research at Tübingen University. (See: S.E. Rhodes, M.J.Walker, A.López-Jiménez, M.López-Martínez, M.Haber-Uriarte, Y.Fernández-Jalvo and M.Chazan, 2016, "Fire in the Early Palaeolithic: evidence of small mammal burning at Cueva Negra del Estrecho del Río Quípar, Murcia, Spain", *Journal of Archaeological Science Reports* vol. 9, pp. 427-436; S.E.Rhodes, M.J.Walker, M.López-Martínez, M.Haber-Uriarte y A.López-Jiménez, "Cultivated fire in the Early Paleolithic: evidence of small mammal incidental burning at Cueva Negra, Southeast Spain," posters\* for meetings of the International Council on ArchaeoZoology ICAZ and the International Palaeontological Congress, Buenos Aires, August 2014; S.E.Rhodes, M.J.Walker, M.López-Martínez, M.Haber-Uriarte, A.López-Jiménez: (poster) "Evidence for cultivated fire during the late Early Paleolithic in southeastern Spain: preliminary results from a micromammal taphonomic approach", 23<sup>rd</sup> Annual Meeting of the Palaeoanthropology Society, Calgary, Canada, April 8-9, 2014, held in conjunction with the Annual Meeting of the American Association of Physical Anthropologists)

### **SIMA DE LAS PALOMAS DEL CABEZO GORDO**

**NOW AVAILABLE:** the important Texas A&M University Press scientific monograph about results of our work at this site: Erik Trinkaus, Michael J.Walker, Eds., *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain* (2017, Texas A&M University Press, College Station, Texas; ISBN 9781623494803).

Over 100 years ago, miners on the hill of Cabezo Gordo (which simply means Big Hill) were attracted by a vein of the iron ore magnetite which made a dark stain in the pale-grey marble rock of the hillside. The iron had welled up in molten form through the limestone when volcanic activity was fierce here during the early Mesozoic. The miners dug an artificial shaft down hoping to follow the vein which, however, petered out, and they found themselves digging hard breccia out of a natural cavern which went not only downwards, but also back up to the surface again in what we now call the *Sima de las Palomas* which is a vertical shaft 18 metres deep the mouth of which is at 125 metres above sea-level on the barren hill-side; the miners took out more than three-quarters of its natural fill. To speed up removal of this unwanted material, they blasted a horizontal tunnel through the hillside to the bottom of the main shaft. Disgusted, no doubt, by finding no iron after so much work, they did not bother to remove that part of the breccia which today still forms an intact column, rich in fossils and stone tools, from top to bottom against the rear wall of the natural shaft, and which we have been excavating scientifically since 1994.

Chance discovery by a spelaeologist called Juan Carlos Blanco Gago in 1991 of a very important fossil, consisting of parts of the upper and lower jaws of a human face, which he noticed in the side of the natural shaft of *Sima de las Palomas* about three metres below the surface, drew our attention to the great research potential of the sediments in the shaft (Gibert, Walker, et al., 1994). The spelaeologist belonged to a local environmental conservation group, and he was descending the shaft on an abseil rope to find out what kinds of birds nested in the cave. He saw the fossil in the upper part of sediments banked against the rear wall of the shaft and pulled it out, without realizing what it was. Being a careful person, he saved it and showed it to us. On cleaning, it turned out to belong to the lower part of the face of a Neanderthal - parts of the upper and lower jaws, in fact. Neanderthals lived in Europe between 150,000-35,000 years ago, and are assigned to the extinct Neanderthal humans subspecies, *Homo sapiens neanderthalensis* or *H. neanderthalensis* for short.

Preliminary field-work by us at this site began in 1992 and continued in 1993, when, together with my palaeontologist friend, the late Dr Josep Gibert of the "Dr M.Crusafont" Palaeontological Institute and Museum at Sabadell (a satellite city of Barcelona), and our helpers, we sifted through rubble which iron-miners who entered the natural cave 100 years ago had piled up inside or thrown out onto the hillside. The miners had also driven a horizontal tunnel through the rock of the hillside to meet the bottom of the shaft. The tunnel became partly filled up with rubble which had fallen down the shaft, and has been removed and sieved to give us many important finds. The important task of sieving the mine rubble on the hillside and in the tunnel gave us 25 finds of Neanderthal bones or teeth. In 1997 a Neanderthal maxilla (upper jaw) bone was found this way. Other finds include parts of jawbones (mandibles) belonging to three adults and two children, various loose teeth, part of a child's maxillary bone of the face, parts of 2 adult cheekbones (zygomatic bones) and two fragments of the massive Neanderthal bony brow ridges over the eye socket, as well as several large fragments of bones of the skull vault - frontal, parietal, temporal and occipital bones. We have also found several vertebrae and fragments of arm bones (humerus, ulna), leg bones (femur, fibula), finger and toe bones, and part of a hip-bone. Some of the bones show traces of burning. Because all these finds are from the mine rubble we do not know where originally they had come from within the cave.

Tens of thousands of years before, the natural shaft slowly filled up with earth and stones which trickled down off the limestone hill-side, together with water rich in calcium carbonate dissolved out of the limestone and which percolated into the earth and rock, cementing them hard in a compact fossil conglomerate called *breccia*. In it, bones of extinct animals hint that sometimes it was visited by leopards who maybe climbed down into the top of the cave with an ease common to all cats, though it is perhaps even more likely that they were hunted and killed by Neanderthals. When the deep shaft was almost filled up, Neanderthal folk settled in, unaware that the earth floor they camped on was over 15 metres thick.

Eventually, the skeletons of three of them (including that whose jaws had been found by Juan Carlos Blanco Gago) became covered by a downward-sloping heap of very large stones. Some may have been laid intentionally over the bodies; others may well have been washed into the mouth of the former shaft by heavy rainstorms - we once were caught unawares by one when working, and had to spend a couple of hours in our excavation covering behind a short-lived albeit terrifying waterfall, unable to climb out through it. The two-metre deep, sloping pile of stones over three Neanderthals whose skeletons were well preserved beneath it, became partly cemented later on by calcium carbonate; we now call this mass of cemented stones "conglomerate A". Nevertheless, it was porous enough for coarse sediment to pass through it afterwards and accumulate behind it. However, quite deeply down in this uppermost sediment there was an

irregular lens of sediment with signs of combustion (we called it the “upper grey layer”), perhaps indicating that human activity took place there before “conglomerate A” had formed completely.

The uppermost sediment contained 65 dispersed fragments of bones and teeth of Neanderthal adults and children, as well as Mousterian or Middle Palaeolithic implements made from flint flakes and animal bones. We excavated the mandible of a baby and another of a child. In 1998 we excavated a large adult mandibular fragment that had a small piece of burnt animal bone cemented to it. This piece of burnt animal bone gave an accelerator radiocarbon (AMS-<sup>14</sup>C) determination of  $34,450 \pm 600$  BP (OxA-10666) that corresponds to a true age that could lie anywhere within the range 40,950-37,622 BP, after calibration and application of 95% confidence limits; moreover, the burnt fragment could have become cemented to the Neanderthal jaw fragment hundreds or even thousands of years after the Neanderthal had died. The determination was made by Professor Tom Higham of the Oxford Radiocarbon Accelerator Unit at Oxford University’s Research Laboratory for Archaeology and the History of Art (RLAHA). Subsequently, on burnt rabbit bone found in the “upper grey layer” not far away, Dr Higham obtained a determination of  $35,030 \pm 270$  BP (OxA-15423) which corresponds to a true age that could lie anywhere within the range 40,986-38,850 BP, after calibration and application of 95% confidence limits - the importance of this qualification will become clear below.

Dr Jean-Luc Schwenninger, who heads RLAHA’s Optical Sediment Luminescence Dating Unit, came to Sima de las Palomas where he bored a horizontal core of sediment into the “upper grey layer”, and when the hermetically sealed core was opened at Oxford the aforementioned burnt rabbit bone was found inside that gave OxA-15423. Dr Schwenninger also had measured the background irradiation on site using RLAHA’s portable gamma-ray spectrometer, allowing him to calibrate the OSL measurement accurately. Quartz grains in the sediment gave the OSL determination of  $54,700 \pm 4700$  BP (X2509) which could correspond to a true age anywhere within the 95% confidence limits of 64,000-44,300 BP. A uranium-series determination of  $43,800 \pm 750$  (APSLP4) obtained on a fragment of unburnt animal bone by Dr Alistair Pike (then at Bristol University’s Archaeology Department, now at Southampton University), could correspond to a true age anywhere within the 95% confidence limits of 45,300-42,300 BP. X2509 and APSLP4 were excavated at positions that were near to each other, both horizontally and vertically, and their 95% confidence intervals overlap at 45,000-44,000 BP.

From “conglomerate A” Dr Pike obtained uranium-series (User) determinations of  $54,100 \pm 3850$  years ago (APSLP-1) and  $51,000 \pm 1250$  (APSLP-6) on fragments, respectively, of unburnt bone from the female Neanderthal skeleton SP-96 (“Paloma”) and unburnt animal bone; their respective 95% confidence limits are 61,600-46,600 and 53,500-48,500 years ago. They may be compared to a uranium-series date obtained Dr Joan-Antoni Sánchez-Cabeza, at the Physics Department of the Autonomous University of Barcelona, from an aragonite crystal from “conglomerate B” (which underlies “conglomerate A”) of  $56,000 \pm 13000/-10000$  years ago (M-5). Preliminary ESR-User dates by Dr Stuart Black of Reading University show that conglomerate B dates from  $67,700 \pm 0.405$  and  $65,070 \pm 0.038$  years ago. OSL estimates from sediment the deep layers below it have been obtained by Oxford University’s Dr Jean-Luis Schwenninger are of  $102,100 \pm 12,000$  years ago (X6889; V1),  $97,000 \pm 9,000$  (X6890; V2),  $125,000 \pm 13,600$  (X6891; V3) and  $130,002 \pm 11,900$  (X6892; V4), with noteworthy uncertainty affecting a fifth estimate of  $90,300 \pm 7,300$  (X6893; V5); the samples were taken for him by his then research student Mariana Sontag-Gonzalez who spent some time with us during our 2015 field season; she is now undertaking doctoral research at Wollongong University in Australia. The new dates have received preliminary publication (M.J.Walker, M.Sontag-González, M.Haber-Uriarte, M.López-Martínez, S.Black, J.-L. Schwenninger, “Preliminary dating of deep layers at Sima de las Palomas del Cabezo Gordo [Torre Pacheco, Murcia, Spain],” 7th Annual Meeting of the European Society for the Study of Human Evolution ESHE Leiden, The Netherlands, 21-23 September 2017, and *Proceedings of the European Society for the Study of Human Evolution 6 [PESHE 6]* p. 210). Before excavation commenced, aragonite crystals extracted from the sedimentary column a few metres above the floor of the Main Chamber had given Dr. Sánchez-Cabeza uranium-series (User) determinations of 124,000 and 118,000 years ago.

A discussion about dating of the articulated Neanderthal skeletons can be found in both our 2017 book *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain* (Texas A&M University Press, College Station, Texas, ISBN 9781623494803), and also in our 2012 article (see M.J.Walker, M.V.López-Martínez, J.Ortega-Rodrígáñez, M.Haber-Uriarte, A.López-Jiménez, A.Avilés-Fernández, J.L-Polo Camacho, M.Campillo-Boj, J.García-Torres, J.S.Carrión-García, M.San Nicolas-del Toro, T.Rodríguez-Estrella: “The excavation of the buried articulated Neanderthal skeletons at Sima de las Palomas (Murcia, SE Spain)” *Quaternary International* 259: 7-21, 2012 (ISSN: 1040-6182). That discussion is most certainly *not* the last word to be said on the matter. A salient aspect of the determinations given above is that there is some overlap between several of the 95% confidence limits that apply to them. One minimal inference is that skeletons embedded in “conglomerate A” belong to a period around 55,000-50,000 years ago when their Neanderthal owners had died. A second one is that Neanderthal teeth and bone fragments continued to be incorporated into later sediment before 38,000 BP, though it is open to dispute whether this incorporation took place in two successive periods or during one period of uncertain length. Whereas it is not beyond the bounds of possibility that Neanderthals were able still to enter the cave at the time the “upper grey layer” was forming (perhaps ca. 45,000-44,000 years ago) and may even have contributed to it by tending fire near the lower part of “conglomerate A”, Neanderthal teeth and bone fragments and Mousterian artifacts in sediment deposited above the “upper grey layer” must have come in from the hillside because some were excavated close to the rock roof up to which the sediments had accumulated, leaving no space for humans to have crawled in. In other words, those remains correspond to a way in which the Neanderthals were behaving outside the cave, presumably one that involved a different manner of dealing with dead bodies. Much earlier, Neanderthals had used the site in a different way again, before “conglomerate B” was deposited, because the deepest sediments that now we are excavating contain burnt animal remains and Mousterian artifacts and, most important, part of a Neanderthal mandible found in 2017 and two loose Neanderthal teeth found in 2016.

From about two metres below the top entrance that gives access to both our upper excavation cutting and the main shaft of *Sima de las Palomas*, we excavated 3 articulated Neanderthal skeletons, two of which had skulls and attached mandibles, between 2005 and 2010. The very first find, which had been made back in 1991 by Juan Carlos Blanco Gago, had come from a similar position, and as it was of a mandible in anatomical connexion with the maxillae (SP1), it is clear that in fact there have been at least three Neanderthal individuals here (or just conceivably four). The articulated skeletal remains of three Neanderthals (two adults and a juvenile) here include skulls, chest, upper limbs, back-bone, pelvis, lower limbs, and bones of the hands and feet. There is one remarkably well-preserved foot, and also an articulated elbow joint (lower part of humerus in articulation with upper part of ulna and radius). They are still undergoing careful albeit slow cleaning, with removal of breccia adhering to the bones by use of vibroscalpels (“air-scribe”) powered by compressed air in our new laboratory at Torre Pacheco.

The Neanderthal skeletal remains were excavated a few centimetres above where Juan Carlos had plucked out the Neanderthal skull fragment (SP1) of the two maxillary bones and teeth cemented to the jawbone, when he descended on his abseil rope in 1991. Our skeleton SP96 is 85% complete and belonged to a young woman whom we now call "Paloma". Below her was a child's skeleton (SP97). Both have well-preserved skulls and mandibles. Both had flexed elbows with the hands raised against the face; this implies intervention by other individuals before rigor mortis set in. Near the child there were two articulated leopard paws, 3 horse astragali, and waste flakes and fragments of knapped chert. Underneath those two skeletons lay that of another adult (SP92); perhaps SP1 had been its skull (this is debatable). None of the three skeletons showed signs of burning (the only signs of burning were on horse bone). Maybe the bodies were covered up with large stones, perhaps to stop hyenas and leopards from scavenging. Our Neanderthal skeletons are of worldwide importance because almost 40 years had passed since the last time a European Neanderthal was excavated with its skeleton articulated in anatomical connexion (at St-Césaire in France). The female skeleton SP96 was the subject of an article published in June 2011 in the *Proceedings of the National Academy of Sciences of the USA* (PNAS). How close were the three skeletons in time to those other Neanderthal remains found dispersed in the finer sediment, which lateron accumulated behind conglomerate A, without doubt well before 40,000 years ago.

The total number of separate bone fragments and teeth from Sima de las Palomas identified to date amounts to some three hundred items. The number of mandibles (or fragments of them) that belong to different Neanderthal individuals is ten (three were found in mine rubble; three from the uppermost part of our excavation; two belong to excavated articulated skeletons SP96 and SP97, plus SP1, and part of another was excavated in 2017 in deeper sediments that are older than 100,000 years ago. If SP1 and SP92 do not belong together, then at least 11 individuals are represented (perhaps at least twelve, from consideration of the many loose teeth from the site).

Towards the end of 2006 I wrote asking about the possibility of hunting for Neanderthal DNA in our *Sima de las Palomas* bones to Professor Svante Paäbo, the internationally renowned geneticist who conducts research into both mitochondrial and nuclear DNA from Neanderthal bones, who is the Director of the ultra-modern, seven-storey-high, Max-Planck Institute for Evolutionary Anthropology at Leipzig in Germany, and whom I had first got to know at a meeting in Madrid back in 1993. He invited me to Leipzig where I gave a talk to his Institute in 2007 which was well received. Svante Paäbo made useful suggestions about how we might best excavate the *Sima de las Palomas* Neanderthal skeletal remains, wearing face-masks and surgical gloves, and putting the fossils into sterile containers. This we did in 2007 and in that autumn Svante's then PhD student, Oxford University Biology graduate, now Dr Adrian Briggs, came to Murcia and we helped him as he extracted samples from our newly-excavated Neanderthal bones in a sterile operating theatre in Murcia University's Veterinary Science Faculty. Dr Paäbo reported back from Leipzig that our excavation technique had been so good that almost no modern human DNA contamination could be detected, though so far, alas, neither has any Neanderthal DNA been identified. In 2008 Dr Paäbo sent over another of his PhD students, now Dr Thomas Marićić, who took part in our *Sima de las Palomas* field season, sampling human remains during excavation. He took the samples back for analysis at Leipzig. Alas, Dr Paäbo's team there still failed to detect either nuclear DNA or mitochondrial DNA; however because they could not detect contamination by modern DNA either, Dr Paäbo thinks that the field methodology was adequate but that over many thousands of years high ambient summer temperatures at the site have destroyed Neanderthal DNA.

A world-famous researcher into Neanderthal skeletal fossils who collaborates with us is Professor Erik Trinkaus of the Washington University of St. Louis, Missouri (USA). Erik visited Murcia to study the *Sima de las Palomas* remains twice in 2007 and again for ten days in January 2011 for a morphological study of "Paloma" (SP96) that was published in June 2011 in the *Proceedings of the National Academy of Sciences of the USA*. Thanks mainly to his tireless work, the scholarly monograph was published in 2017 which is *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain* (E.Trinkaus & M.J.Walker, Eds., Texas A&M University Press, College Station, Texas, ISBN 9781623494803). Most of the chapters have been written by members of our research staff and MUPANTQUAT with Erik and scientists at several institutions.

Among them is Barcelona University anthropologist Dr Alejandro Martínez Pérez-Pérez who took casts of all of the teeth from *Sima de las Palomas* which help him to conduct research into attrition and wear on the crown; his research on microstriations on the sides of tooth crowns throws light on the kinds of food eaten by prehistoric folk. His work complements research on our teeth that has been undertaken over the years both by the dental anthropologist and orthodontician Dr Vince Lombardi from Pittsburgh, a long-standing collaborator who joined us in the field again in 2014, and in the Subdepartment of Physical Anthropology at Murcia by Dr Josefina Zapata who has photographed carious lesions in two teeth. In 2011 we were visited by physical anthropologist Dr Patricia Bayle, at Bordeaux University who returned in March 2012 with Professor Kate Robson-Brown from Bristol University together with its travelling microscanner (brought in a very large van), accompanied by its specialist engineer Nick Corps, which gave excellent resolution with the *Sima de las Palomas* loose teeth, on which detailed research is continuing. Two students of Professor Trinkaus also have assisted in our dental research, John Wilman who visited us in 2011 and Sarah Lacy who was present with Drs Bayle and Robson-Brown in March 2012. Lead author Dr Bayle and her colleagues presented a poster with us at the 6<sup>th</sup> Annual Meeting of the European Society for the Study of Human Evolution (held at Alcalá de Henares near Madrid), entitled "Enamel thickness and dental tissue proportions in the Neandertals from the Sima de las Palomas del Cabezo Gordo, southeastern Spain" (you can see this poster in *BRIEFING YOU* above).

At the same meeting lead author Dr Robert Power and his colleagues presented a poster with us entitled "Dental calculus indicates widespread plant use within the Neanderthal dietary niche". We have had several visits from Dr Amanda Henry and her colleagues at the Max Planck Institute for Evolutionary Anthropology at Leipzig where she and her research colleagues Drs Domingo Carlos Salazar-García, Robert Power and Cynthianne Spiteri study the plant component of Neanderthal diets by investigating phytoliths in dental calculi, and other biological residues, and they have detected their presence in calculi of *Sima de las Palomas* teeth (see D.C.Salazar-García, R.C.Power, A.Sanchis Serra, V.Villaverde, M.J.Walker, A.G.Henry, 2013, "Neanderthal diets in central and southeastern Mediterranean Iberia" *Quaternary International* 318: 3-18, ISSN: 1040-6182). Research is being conducted on a possibility of prehistoric biological residues on several large rounded river cobbles that must have been brought to *Sima de las Palomas* by the Neanderthals, perhaps in order to grind or pound foodstuffs, or maybe mineral pigments. Dr Spiteri has carried out research on residue analysis and in 2014 she was helped at the Leipzig Institute by Queensland University PhD student Birgitta Stephenson. Birgitta is both a pharmacologist and an anthropologist who has excavated with us several times and has developed new histochemical techniques that have led to identification of biological residues on prehistoric Australian Aboriginal grinding stones. At *Sima de las Palomas* the river cobbles have been excavated, together with many Mousterian flint implements and charred animal bones, in the deep layers of 130,000-100,000 years ago that we are excavating, such that

now we are over three metres below where the articulated Neanderthal skeletons were uncovered. In 2016 two Neanderthal front teeth were excavated in these deep layers, being the first Neanderthal remains to have been found in them, and then in 2017 part of a mandible of a Neanderthal was excavated in them..

These deep levels are extremely interesting because they demonstrate that the site was used for domestic purposes such as cooking over a long period of time indeed. Presumably food was prepared on the hillside beside the mouth of the shaft into which refuse was allowed to fall. From the deep layers come mandibular fragments of two porcupines (*Hystrix javanica*) that have been studied by Sara Rhodes who excavated with us in 2011, 2012 and 2013 when she was studying for her Master's degree at Toronto University and who has taken up a German government scholarship to do a PhD at Tübingen University; a poster about the porcupine mandibles was presented at the 41<sup>st</sup> Annual Meeting of the Canadian Association of Physical Anthropology in 2013, which you can see in *BRIEFING YOU* above (S.E.Rhodes, S.E., M.J.Walker, M.López-Martínez, M.Haber-Uriarte, A.López-Jiménez, A.T. Buitrago-López, G.Dewar, 2013: "Analysis of *Hystrix* specimens recovered from Sima de las Palomas, Murcia, Spain: identification and paleoenvironmental revision", p.47 in *Program with Abstracts, Programme avec les Résumés, Canadian Association for Physical Anthropology, 41st Annual Meeting, October 17-20 2013 Scarborough, ON (University of Toronto, Scarborough), Association Canadienne d'Anthropologie Physique 41ème Congrès Annuel du 17 au 20 octobre 2013 Scarborough, ON (Université de Toronto, Scarborough)*, Toronto, Canadian Association for Physical Anthropology and University of Toronto).

In 2011 we began to carry out CAT scanning of the excavated Neanderthal skeletons using the new General Electric scanner installed at the end of 2010 in Murcia University's Veterinary Faculty Hospital, and to help us to orientate the study we were joined by the renowned Swiss expert in scanning Neanderthals and other hominids, Professor Christoph Zollikofer, Director of Zurich University Anthropology Institute, and his wife Dr Marcia Ponce de León (they have published many important scientific papers using the technique). Later in 2011 Jon Ortega Rodríguez and I visited their Zurich lab. Jon returned there in autumn 2012 for a few weeks to learn the IT techniques our Swiss colleagues use. Drs Zollikofer and Ponce de León returned to Murcia in 2015 and undertook further scanning here in order to resolve one or two anatomical details. We published a poster with them that I presented in September 2012 in Bordeaux at the 2<sup>nd</sup> Annual Meeting of the recently formed European Society for the Study of Human Evolution, and the poster was shown again in April 2013 accompanying a talk about the *Sima de las Palomas* Neanderthals that I was invited to give at the 55<sup>th</sup> Annual Meeting of the international Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age, held at Vienna's grand Natural History Museum. Jon is continuing the work with the scanner here at Murcia with the dual aim of both facilitating location of bone hidden in breccia cement and especially the creation of virtual reconstructions of Neanderthal skeletal parts using image-analysis computer programs. Klára Karáková (née Parmová) from Brno in the Czech Republic, who worked with us in various field seasons and in the lab came again in the autumn 2015 to help Jon with further cleaning and separation of cemented bones and her help is greatly valued by us.

Animal remains from *Sima de las Palomas* include teeth of hippopotamus and hyaena, and bones and teeth of leopard, a possible cave lion phalangeal bone, aurochs, wild horse, ibex, red deer, lynx, porcupine, fox, badger, hare, tortoise and perhaps wolf. Between 1992 and 2017 several hundred classifiable skeletal elements have been found and around thousands of bone splinters and fragments many of which still have adherent cemented breccia. Of particular interest are leopard remains. Two articulated leopard paws were excavated near to the Neanderthal skeleton SP97, as mentioned earlier. In 1991 a complete leopard skull was found, exposed in a low position in the breccia column, by the same spelaeologist who found the first hominin SP1, and according to both the palaeontologist, the late Dr Josep Gibert, and another palaeontologist who has also helped studying the fauna, Dr Alfonso Arribas of the Museum at Madrid's Instituto Tecnológico y GeoMinero de España, it has been assigned to a late Middle Pleistocene/early Late Pleistocene type known from southern France as *Panthera pardus* cf. *lunellensis*. Although two uranium-series determinations (of 124,000 and 118,000 BP) on mineral specimens from low down in the breccia column correspond to the last interglacial period, it may be wondered whether the leopard fossil found in 1991 could have fallen from higher layers in the column, owing to disturbance by mining operations in recent times.

In 2006 we excavated two leopard phalangeal bones in our upper cutting close to the head of the Neanderthal child SP97, and near to it we excavated the bones in anatomical articulation of two leopard paws; none of those bones had undergone burning. Also nearby were horse ankle bones that had undergone burning, in one case found in articulation with the distal end of a tibia. Three struck chert or flint flakes and one hundred tiny knapping spalls were excavated near the lowest of the three Neanderthal articulated skeletons, SP92. The undisturbed nature of skeletons SP96, SP97 and SP92/SP1 suggests that scavengers did not disturb them and that the articulated leopard paws may have been cut off by Neanderthals themselves. SP96 and SP97 were found with their knees drawn up and elbows flexed with their hands against their faces, suggesting arrangement before rigor mortis had set in (this position has been documented at some other sites with Mousterian artifacts). Perhaps the bodies were covered with stones to deter scavengers from interfering with them.

In 2003 my colleague in the Biology Faculty at Murcia University, palaeopaleontologist Professor José Carrión defined pollen in soil at *Sima de las Palomas* of species which include both evergreen and deciduous oaks (such as *Quercus faginea*) and some other broad-leaved trees, pointing to greater availability of surface water (see the article in *Global Ecology and Biogeography* vol. 12, already mentioned); he and his team returned and took more samples in 2009 and 2010. The species from the uppermost sediment include some species that are found in Africa and do not regenerate easily after prolonged frost, implying that conditions were not unduly cold.

Even before we were able to build a 20-metre high scaffolding tower and take aragonite crystals for uranium-series dating from the breccia column, we had a fair idea of its age because we had sent 3 fragments of fossil animal bone, cemented in breccia thrown out from the shaft by the miners which we had found on the hillside, to geochemist Dr Peter Pomery of Australia's University of Queensland who obtained electron spin resonance dates of 83,000/42,000, 146,000/73,000 and 532,000/266,000 years ago. The estimates served to give a rough idea of the great antiquity of the remains though Dr Sánchez-Cabeza's uranium-series dates gave us the age-range of the visible breccia column with better accuracy and precision as spanning the last interglacial period and continuing into the last glacial period. The new estimates from Drs Schwenninger and Black mentioned earlier suggest that much of the sedimentary fill began to accumulate about 130,000 years ago at the onset of Marine Isotope Stage MIS-5.

The Mousterian industry from the site includes some 1,200 classified pieces, from retouched scrapers to simple struck flakes and cores (and there are over 3,000 unclassifiable fragments of flint and other stone materials that also must have been brought to the cave by the Neanderthals, because they do not occur in the limestone in which it lies). Excavation in the deep layers has provided several

retouched Mousterian implements and many fragments and spalls, as well as part of what may be a bone artifact (maybe a "slicker" for preparing skins; in French a "lissoir") – bone artifacts are very uncommon in Mousterian assemblages, though the piece in question is still undergoing detailed analysis and may not be a tool. Many artifacts are on good quality flint (and even occasionally jasper), but there are also rock-crystal implements and others of marble, limestone, siliceous metamorphous dolomitic limestone, quartzite, and milky quartz. There are typically Mousterian stubby points or convergent scrapers, and flat triangular projectile points are common (of Levallois or "pseudo"-Levallois type). In 2012, 2013, 2014, 2015, 2016 and 2017 we recovered smooth, rounded, cobbles of marble (unlike any stones previously excavated) which may have been used to pound minerals (e.g. ochre) or perhaps plant foods, which are undergoing microscopical inspection.

At the foot of the breccia column, a test pit in the floor of the main chamber shows that it lies on a depth of at least a metre-and-a-half of rubble and soil disturbed by the miners who left behind a Winchester rifle cartridge in it! In 1997 we considerably extended the excavation here down into what seemed likely to be undisturbed sediments without, however, any palaeontological or palaeolithic remains so far. This work continued downwards and outwards in 1998, 1999, 2000, 2001 and 2002. We thought we had been rewarded when we discovered a layer extraordinarily rich in microfaunal remains that we meticulously excavated until in 2001 we found iron nails and hooks in it, indicating that it was no more than a heap of skeletons of rock doves, bats and small mammals, which the miners who entered the cave in the nineteenth century must have gathered together and burnt, before covering them with soil.

In 2002 we excavated down a further 1.5 metres in the deepest sediments in this cutting until calcrete flowstone covering cobbles and limestone rock blocked further excavation. We found three Palaeolithic struck flint flakes, all heavily patinated, and infer from the nature of the sediment that reworking of it had taken place, perhaps during the last interglacial period when the sediment here was waterlogged because the water table was higher than today. The reworking, combined with mining operations, indicates that this part of the cave does not afford a sequence of undisturbed deep Pleistocene sediments and excavation here has been discontinued therefore. We now think that those sediments hint at a new interpretation of the sedimentary and geomorphological history of the cave. It is plausible that today's main chamber is the result of miners having broken through a rock wall from an open natural karstic rift, down which they had first entered the cave, into a nearby karstic rift that they found to be completely filled with Late Pleistocene breccia (most of which they threw outside). Only at a greater depth still, we now think, did these two hypothetical rifts communicate formerly via a horizontal phreatic karstic network of small passages in which mixing of waterlogged sediments took place whenever the water table rose high enough to inundate them; this network did not open on to the hillside and therefore could never have been entered by animals or humans during the Middle or early Late Pleistocene. Thus the lower cutting we had excavated beneath the open rift entered by miners is of no palaeoanthropological interest.

It is nevertheless possible that beneath our scaffolding tower, sediments deep to it, in what we now believe was once a parallel rift, could contain material that had fallen into it from above, including the three Palaeolithic flakes that probably became displaced laterally, in the aforementioned hypothetical horizontal network, for us to discover deeply below the rift whereby the miners had entered the cave system. We also suspect the rift containing the breccia column may have been full of water during the last interglacial period, opening at the surface as a well of water where our upper cutting now is. Five metres above the floor of the main chamber, where the column of breccia juts forward below the vertical wall that it presents higher up, we conducted excavation of a trial cutting in the lower part of sedimentary column, but the results were not particularly informative and we ceased work there.

## CONCLUDING REMARKS

For a palaeoanthropologist, having two important sites only 100 kilometres apart is a dream come true! Quite apart from the potential of exciting new discoveries, the presence of 2 sites of sites of archaic European humans in contrasting environments opened up fascinating possibilities for comparing and contrasting how they utilized the different environments and the natural resources they offered, namely the upland environment of *Cueva Negra* and the milder coastal one, even in the ice-age, of *Sima de las Palomas*.

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## RESEARCH GOALS AND HOW WE ACHIEVE THEM

Our 2017 field research will involve excavation at both *Sima de las Palomas* and *Cueva Negra*.

Our main objective at *Sima de las Palomas* is to continue to excavate, from above downwards, the hominin and stone-tool bearing sediment which forms a 20 metre-high column of breccia against the rear wall of the natural shaft. This is a technically complicated task. 100 years ago iron-miners entered the shaft and removed much of the sediment they found in it. They left behind a 20 metre-high column of breccia under a rocky overhang against the rear wall of the shaft.

In order to excavate the column of breccia scientifically, a 20-metre high scaffolding tower with platforms was built inside the shaft in 1994, and excavations in 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016 and 2017 have already produced many important new hominin finds in early Late Pleistocene layers belonging to the early part of the last ice age.

Every morning we all walk up a steep, narrow footpath to the site. This takes about 15 minutes. Then, those helpers who excavate at the top of the column of breccia must also scramble up the hillside to the mouth of the shaft, which is covered by an iron grille. We open the grille and climb down a 3-metre ladder to the platform at the top of the tower. For safety, we wear stout boots because the hillside is steep and rocky and it is easy to sprain an ankle.

When we are excavating in our upper cutting here, we may wear safety harnesses which are belayed from the tower, and also hard hats. We trowel the fossil soil using small plasterers' trowels (with diamond-shaped blades) and sometimes we use surgical scalpels and fine dental probes. Any finds we make are placed on a plastic tray. Scientific excavation is a painstaking and delicate business, and cannot be hurried. When important finds are made, their position must be carefully measured before they can be removed.

The rest of the excavated soil is put in a bucket which we pass to helpers on the platform of the tower. They lower it down on an aerial ropeway. At the foot of the tower, other helpers empty the soil into wheelbarrows which they wheel out of the cave along the horizontal mine tunnel. The soil is then put in bags and carried on the backs of other helpers down to our 4-wheel-drive vehicle.

This is then driven 3 kilometres to the cutting sheds of the limestone quarrying company which owns the hill of *Cabezo Gordo*. Here, other helpers empty the soil over metal geological sieves which have a fine mesh, and then hose these with a jet of water so that the soil dissolves and leaves stones, flints, bones and other finds which we put into bags. Important finds have been made this way, such as the milk teeth of Neanderthal children.

After lunch, we wash all of the finds in bowls of clean water, leave them to dry, and later sort and them and put them into bags with appropriate labels. These will later be the object of future research in the lab, well after the expedition is over.

The first hypothesis we were testing (1994-2010) was that the upper part of the sediment does, indeed, contain remains of Neanderthal folk and associated Mousterian artifacts and food remains, from between 60 and 40,000 years ago. Latterly, (2011-2017) we have recognized that also there are deeper layers still, which we have now dated to between 130,000 and 100,000 years ago, and these also contain Mousterian artifacts and Neanderthal skeletal remains, as well as abundant animal bones. We yet do not know how far down in these layers the remains will continue to be present.

At *Cueva Negra* the immediate hypotheses we are testing are two-fold. First, we are exploring a widespread hypothesis (supported at other cave sites) that not only Neanderthals (*H. neanderthalensis*) but also their pre-Neanderthal forebears (*H. heidelbergensis*) carried out more day-to-day activities in areas that were well-lit by daylight, rather than in the darker innermost parts of caves, which receives support from our excavation of the important activity area from which the "Acheulian" hand-axe came. However, even more exciting is the 2011-2017 discovery of finds from a very deeply-lying deposit that demonstrate that fire was used at the site.

We walk up to the cave by a well-trodden footpath every morning. We carry out excavation at *Cueva Negra* by trowelling. Because the soil here is light in colour, unwanted foot-prints of boots and joggers or trainers show up in it all too prominently, so when we get to the cave in the morning we change out of such footwear and slip on very light slippers or plimsolls with absolutely flat soles and no tread at all. On the other hand, when we are wet-sieving the excavated sediment, we change footwear again, using gum-boots or rubber boots so that muddy sediment does not get on to our light slippers or plimsolls to be carried into the cave and onto the areas under excavation. Sometimes hand picks have to be used to break up the harder soil. Once again, we have the generator and power tools for use if needed.

The only way we can wash our soil here, in order to separate finds from the hard soil that encrusts them, is by pumping water up to the cave from the *River Quípar* which is 40 metres vertically below it. We do this using a petrol-driven pump, to pump water up through hose-piping to two large petrol drums; the hose-piping often springs leaks because of the high pressure of the water inside it. Helpers spend quite a lot of time scrambling up and down the steep hillside, in order to start up and stop the pump, re-prime it, or fix leaks in the hose-pipe!

Two very large oil drums are stood beside the cave mouth at a level slightly above that of our metal geological sieves onto which we put soil, so that other hose-pipes from their base let water run down by gravity to the sieves over which we play the water. We use four nests, each of which consists of 3 interlocking, stainless-steel, geological sieves of reducing mesh-size down to 2 mm mesh, one above the other, with the finest sieve being that at the bottom of the nest. We pick out the finds and save them. After lunch we wash them, and after they are dry we sort them and put them into labelled bags for future research.

## APPLICATION OF RESULTS

### WHO BENEFITS FROM OUR FINDINGS AND HOW?

Beneficiaries must include scientists and students concerned with *hominin evolution* and *palaeoanthropology* in the *later European Quaternary* because we are throwing new light on two matters: (a) the evolution of *Neanderthal Man*, and (b) the ways in which *Neanderthal Man* and his precursors, who are called *Homo heidelbergensis*, utilized natural resources in different ice-age environments. Our Cueva Negra and Sima de las Palomas researchers have therefore set up a new body:

#### **MUPANTQUAT (MURCIAN ASSOCIATION FOR THE STUDY OF PALAEOANTHROPOLOGY AND THE QUATERNARY)**

(Asociación Murciana para el Estudio de la Paleoantropología y el Cuaternario)

<http://www.mupantquat.com>

Email: <mupantquat@gmail.com>

The **MUPANTQUAT** association was established and registered officially in June 2012 following advice from Murcia's Director-General for Cultural Heritage, in order both to oversee the research at our two sites of Cueva Negra del Estrecho del Río Quípar and Sima de las Palomas del Cabezo Gordo, and to disseminate information to the general public about palaeoanthropology and the Quaternary. In 2013 an Agreement of Collaboration with Murcia University was signed. Subsequently we have signed agreements of collaboration with the town councils of Caravaca de la Cruz and Torre Pacheco, the Murcian Regional Society of Geographers, the Murcian Cultural Association for Palaeontology, and the Society for Historical Studies of Quípar, Argos and Alharabe Valleys. The Chair of **MUPANTQUAT** is Murcia University's Michael Walker, and his co-directors of the Field School and excavations are archaeologist Mariano López Martínez (Secretary, **MUPANTQUAT**) and archaeologist and palaeoanthropologist Dr María Haber Uriarte (Vice-Chair, **MUPANTQUAT**) who teaches at Murcia University. The committee of **MUPANTQUAT** has as its Treasurer biologist Antonio López Jiménez who undertakes research on the Cueva Negra Rodent fossils. Other **MUPANTQUAT** committee members are Palaeolithic archaeologist Dr Ignacio Martín Lerma who teaches at Murcia University; biologist Jon Ortega Rodríguez who undertakes Neanderthal skeletal restoration and reconstruction, Murcia University teacher Palaeolithic archaeologist Dr. Ignacio Martín Lerma who carries out microscopic use-wear analysis of stone artifacts, biologists Azucena Avilés Fernández and Ángel Buitrago López, audiovisual communications expert Jesús García Torres, archaeologists Norman Fernández Ruiz and Consuelo Caravaca Martínez, and biology undergraduate Hugo Cano Fernández. Our association has several other university teachers and high-school teachers among its membership; they include Murcia University's palaeopalynologists Professor José Carrón and Dr Santiago Fernández, analytical chemist Dr Juan Luis Polo, and palaeontologist Dr Gregorio Romero, and Cartagena Polytechnic University geologists and engineers Drs Tomás Rodríguez Estrella, Ignacio Manteca and José María Cano. Several of these members give talks at our annual Field School or help with research on material from the excavations.

### OUR PROJECT BENEFITS THE EDUCATIONAL COMMUNITY:

Our field and lab research has an educational impact that reaches out to schools and local institutions in the following ways:

#### **EDUCATIONAL TALKS, GUIDED VISITS, etc.**

Our **MUPANTQUAT** association cooperates actively with Murcia regional government's public "*Integra Foundation*" which has produced an animated 30-minute film with us about Cueva Negra, called simply "Cueva Negra". It is aimed at a teen-age audience, and seems to be going down well! Since its first showing in October 2012, **MUPANTQUAT** and the "*Integra Foundation*" have shown it in towns and cities in our region to the general public, with free entry. After each showing there was a public **MUPANTQUAT Colloquium** with a couple of brief talks by us about our findings, after which the public asked questions which we did our best to answer. I think you still may be able to access the film on [http://www.regmurcia.com/servlet/s.SI?sit=a,0,c,0,m,0&r=AgP-24607-DETALLE\\_EVENTO](http://www.regmurcia.com/servlet/s.SI?sit=a,0,c,0,m,0&r=AgP-24607-DETALLE_EVENTO).

In 2014, 2015, 2016 and 2017 **MUPANTQUAT** has held meetings at which members or invited guests have given talks covering a wide range of subjects about Palaeoanthropology or Quaternary Science. **MUPANTQUAT** also has organized a series of field excursions to our sites in 2013, 2014, 2015, 2016 and 2017, as well as to other relevant sites in the region, for high-school students and university undergraduates, and members of the public. It also has organized public lectures and talks on appropriate topics and collaborated with talks and guided excursions in events organized by town councils and other bodies. **MUPANTQUAT** members have assisted in the organization of and taken part in various events in the Murcian Region which have been directed at engaging young people with history, archaeology and the past, in various towns, notably, in Torre Pacheco, Caravaca, Cartagena, and Murcia.

On September 30<sup>th</sup> and October 1<sup>st</sup> 2017 **MUPANTQUAT** organized an extremely well-attended seminar comprising 8 public lectures, with free admittance, in the 100-seat lecture room of the grand *Real Casino* in Murcia city centre, which were opened by the distinguished palaeontologist and pioneer of the hominid research at Atapuerca Dr. Emiliano Aguirre Enríquez, who turned 93 a few days after our meeting. It was an honour for us to receive him and his wife and we have made in an Honorary Member of **MUPANTQUAT**. The theme of the meeting was "*The Evolution of the Human Brain and Cognitive Archaeology*". Four lectures were given by guest speakers Drs. Miguel Caparrós (Musée de l'Homme, Paris), Antoni Gomila (University of the Balearic Islands), Héctor Manrique (University of Saragossa) and Dr Blanca Samaniego (National Archaeological Museum at Madrid). Four lectures were given by Murcia University Drs. Trinidad Herrero, María Haber, Ignacio Martín and myself, Michael Walker. The seminar was made by possible thanks to financial support from our local savings bank's beneficial foundation (Fundación CajaMurcia) and two businesses (Sakata España, S.L. and Incogás). Preparation is underway for publication of the proceedings in Spanish, which should be useful for university undergraduates.

In 2015 **MUPANTQUAT** hosted a 3-day series of public lectures (with free attendance), on October 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup>, on *Human Evolution in Spain (La Evolución Humana en España)* that our local savings bank's beneficial foundation (Fundación Caja-Murcia) sponsored at its 300-seat lecture theatre in Murcia city centre, which had an astonishing attendance with people having to sit in the aisles! Our speakers were the palaeoneurologist Dr. Emiliano Bruner (of the Centro Nacional de la Investigación de la Evolución Humana at Burgos, i.e. Spain's National Centre for Human Evolution Research), the prehistorian Professor José Ramos (of Cadiz University) who excavates on both sides of the Gibraltar Strait at Palaeolithic sites, and the editor, author, and documentary filmmaker about archaeology and human evolution, Manuel Pimentel, whose "Arqueomanía" production team has produced several series for Spanish national television and filmed us on several occasions, so we presented him with a certificate designating "Arqueomanía" an Honorary Member of our association (this was at his request after we had proposed conferring honorary membership on him). The following month, **MUPANTQUAT** committee members María Haber and Mariano López gave talks during the public seminar held on November 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup> at Caravaca in Murcia, entitled "*I Jornadas de Arqueoturismo y Ecoturismo "Tierra de Ibéricos": El Patrimonio como Generador de Estrategias e Ideas para el Desarrollo Territorial*".

Our **MUPANTQUAT** members regularly give talks at high schools and organize guided excursions to our sites for students. Each year there is an Open Day when the general public can visit *Cueva Negra* during the period of our annual excavation as well as a public presentation of our findings at the Caravaca town hall, and a similar Open Day at *Sima de las Palomas* before the excavation campaign finishes with a similar public presentation at Torre Pacheco town hall. The Open Days draw large crowds, especially at *Sima de las Palomas* where over a thousand visitors have appeared on some occasions! In 2017 Torre Pacheco town council asked us to organize an additional Open Day at *Sima de las Palomas*, which **MUPANTQUAT** hosted on March 26<sup>th</sup> and drew another large crowd of visitors.

**MUPANTQUAT** offers a reduced subscription to student members and we encourage undergraduate participation in the field and lab. Our Field School helpers become members of the Association during the year when they participate and some of them have renewed their annual subscription. **MUPANTQUAT** has several university teachers and high-school teachers among its membership. Several of them give talks about their work or research to members and invited guests (often quite a lot, especially undergraduates!).

The educational community is very much interested in the common humanity of our species and of its origins. Human evolution, over 100 years after Darwin, is only now ceasing to be the Cinderella of the sciences, thanks to 30 years of unceasing palaeo-anthropological research around the globe. An outstanding question -- which has been the topic of more than one recent book -- concerns the relation between our modern world-wide species of *Homo sapiens* and some earlier forms that were present not so long ago during the last ice age, such as *Neanderthal Man*. How alike or unalike were they? How related or unrelated are they? When and where did their common ancestors begin to go their separate ways? Did they behave differently, particularly with regard to utilization of local resources? Did the ancestors of modern people become skillful hunters who used foresight, while *Neanderthals* died out because they could not use foresight and were usually scavengers whose "hunting" amounted to no more than unplanned skirmishes with large game? These are intriguing questions the project is beginning to throw light on: for instance, our very recent Palaeolithic discoveries at *Cueva Negra* show that a million years ago even *pre-Neanderthals*, known to palaeoanthropologists as *Homo heidelbergensis*, could pick and choose, at will, between alternative core-reduction knapping sequences, depending on whether they wanted to make core-tools (such as hand-axes) or flake-tools (for subsequent edge-retouch) out of local stones.

## PUBLICATION AND DISSEMINATION OF OUR FINDINGS:

Our *Cueva Negra* and *Sima de las Palomas* research team and **MUPANTQUAT** are involved in several forms of dissemination of our work. Here are some of them.

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### **BOOK PUBLISHED IN 2017:**

*The People of Palomas: The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain.* (Edited by Erik Trinkaus and Michael J.Walker; published by Texas A&M University Press, College Station, Texas, ISBN 9781623494803). This is a dense scientific book which makes for heavy reading. It is aimed at a specialized scientific readership. Most chapters are coauthored by our research colleagues or **MUPANTQUAT** members.

In October 2015 the English text of a semi-popular book about our work was given to the editor, Claire Litt, of the archaeological publisher Oxbow Books at Oxford, though the manuscript now requires revision because of new discoveries, and we expect publication during 2018. We proposed the title as "*How the Earliest Cave Folk of South-East Spain were Dug Up*" but Oxbow wants us to change it. We had hoped to get the book out in 2017 but many administrative and academic affairs have interrupted our endeavour. We hope also that a Spanish edition of the book will go to press here at Murcia in 2018 and the publisher here will be our own association **MUPANTQUAT**. As I write, in January 2018, our compositor is arranging the illustrations in the chapters of the Spanish text. The book is aimed at young people, and takes a "hands-on" approach, emphasizing, with plentiful illustrations, how we have carried out the work, what methods and techniques we have employed in the laboratory and in the field, instead of placing the emphasis on the significance of our findings in an academic context of human evolution in the Old World during the Pleistocene. We hope the book will be attractive to high-

school students and their teachers, and perhaps useful to first-year university undergraduates and college students, as well as being accessible to general readers interested in exactly *how* we know what we know about the distant past. We do not want to present another erudite weighty tome, only of interest to a specialized readership of scholars and academics (such learned volumes go unread as often as not and soon become remaindered as discount “bargain” offers).

We both publish and present at meetings our scientific findings in both English and Spanish, and you will find a list of these below. Some are in scientific journals with high international impact; others are aimed at a wider readership, including undergraduates, including presentations at congresses of specialists or other meetings of particular interest-groups. Some of these are international or national, but others are local..

However, we also present our findings to international and national media. In January 2013 PBS-NOVA showed a TV documentary in English “*Decoding Neandertals*” in which we took part in 2012 (try <http://video.pbs.org/video/2323758207>); and in 2011 ARTE-XENIUS showed a TV documentary “*Neandertaler*” in German and French in which we took part in 2011. In 2010-11 we took part in the Spanish national television (TVE) documentary series ARQUEOMANÍA and a new 4-part series, ARQUEOMANÍA DOSSIERES was shown in October 2013 in which we have taken part also. An hour-long film in Spanish was made in 2004 which features Sima de las Palomas del Cabezo Gordo, called “*Piedra sobre piedra*” (“*Stone upon stone*”), directed and produced by a Murcian, Roque Madrid, for his Madrid-based production company CUARTOCRECENTE, and sold to the international channel of Spanish national television (TVE) whose HISpasat satellite beams to a wide audience in Latin America (the film was shown over 10 times). In June 2011 Spanish national television (TVE “Tres-14”) put out an hour-long programme (“*Lo que nos une a los neandertales*”) of interviews at Barcelona University with each of the six speakers, M.J. Walker included, in the special seminar on Neanderthals in the Iberian Peninsula held as part of the XVII Congress of the Spanish Society for Physical Anthropology. Our sites have been the object of visits by radio and TV crews, and every year since 1994 broadcasts have been made by both public and private radio and TV stations: BBC, RTVE, Onda-Cero, Ser. In 2005 our excavation of Neanderthal leg and foot bones at Sima de las Palomas was covered on prime-time TV news by Spanish national television which in 2003 gave similar coverage to both the discovery of the *Cueva Negra* hand-axe and the excavation of a child’s mandible at *Sima de las Palomas*. In December 2003 the popular radio-presenter Nieves Herrero had M.J. Walker on her two-hour chat show on Spanish national radio RNE.

A gratifying event during our 2010 field season was a two-day visit by scientific journalist Rosa Tristán of Spain’s second-largest circulation daily newspaper, *El Mundo*, which ran a full 3-page spread by her about both our sites in its Sunday science supplement, with the partly-cleaned juvenile Neanderthal skull and mandible we had excavated in 2008 at Sima de las Palomas occupying the whole cover page. It was the first time we have attracted so much public attention in the national press. In 2011 *El Mundo* featured our discovery of fire at *Cueva Negra*, and *La Verdad* gave a two-page coverage to a press conference in Murcia in honour of the visit here by Professor Erik Trinkaus.

Another national publication about current scientific research of all kinds in Spain and whose web-site is greatly visited by scientists and high-school teachers here also put out an article in Spanish by us in October 2010 about both our sites which has received A FEW thousand hits <http://www.aecientificos.es/escaparate/verpagina.cgi?idpagina=20630480&refcompra=>, or you can go to <http://www.aecientificos.es>, then click on Artículos de Interés Científico, the article on the web has several colour illustrations; the journal is called *Acta Científica y Tecnológica* and our article is now in print in two parts in its volumes 18 and 19 for 2011 (see our list of publications).

Some years ago we successfully undertook a very different kind of public enterprise, which was the *TRAVELLING PUBLIC EXHIBITION about our sites and research at them*, called: “*Archaic Europeans and Neanderthals: Project HOMO, Hominins, Technology and Environment in the Middle and early Upper Pleistocene*” which was all about our work at *Cueva Negra* and *Sima de las Palomas*, and travelled around the European Union, because it won funding from the European Commission’s “Culture 2000” Programme (2000-0820CLTCA1A) so that the Commission paid for half (€150,000 euros) of its cost, the other half coming from the participating institutions that have agreed to display it, namely Murcia’s Museo de la Ciencia y del Agua (Science and Water Resources Museum) where it was open to the public in 2002 for three months, the Austrian national Museum of Natural History at Vienna where the exhibition was unveiled for the first time in October 2001, the “Dr.M.Crusafont” Palaeontological Museum of Barcelona at Sabadell which displayed it during 2002, the Oxford University Museum of Natural History which showed it from September to Christmas 2002, and, near to our *Sima de las Palomas* site in Murcia, at the old Town Hall of Torre Pacheco where it was in Spring of 2003. After that it went to Logroño in northern Spain, and in October of 2003 it opened at the splendid Science Museum at SanSebastián in northern Spain’s Basque Country for a six-month showing. Later in 2004 it was shown in the spacious foyer of Murcia University Library for three months, after which it visited a town in Murcia called Abarán. Currently it is displayed near to *Sima de las Palomas* in the town of Torre Pacheco. This exhibition has given research at our two sites great publicity around Europe – it received hundreds of visits from groups of high school students in all the centres where it was on display. I am not sure but perhaps you may be able still to open up a slot on the web about it at <http://www.contraplano.es/homo>

## Various public lectures and exhibitions about our sites:

Over the years I have given many lectures about the twenty-five years of field research at *Cueva Negra* and *Sima de las Palomas*, and on scientific matters arising from it. Most of them are given on behalf of the research team and its many collaborators, who are coauthors with me of publications on which they are based or that emanate from them (see Publications).

In September 2017 I attended the 7<sup>th</sup> Annual Meeting at Leiden in Holland of the European Society for the Study of Human Evolution and presented two posters (the posters are in this Briefing for you to study) about work at our sites: namely, M.J.Walker, M.Sontag-González, M.Haber-Uriarte, M.López-Martínez, S.Black, J-L. Schwenninger, “Preliminary dating of deep layers at Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain),” *Proceedings of the European Society for the Study of Human Evolution* 6, PESHE 6, p. 210 (ISSN 21950776), and G.Linares-Matás, J.Yravedra, I.Martín-Lerma, J.Aramendi, L.Courtenay, M.A.Maté-González, M.Haber-Uriarte, M.López-Martínez, M.J.Walker, “Preliminary taphonomical assessment of the macromammalian zooarchaeological assemblage at the late Early Pleistocene site of *Cueva Negra del Estrecho del Río Quípar* (Caravaca, Murcia, Spain),” *Proceedings of the European Society for the Study of Human Evolution* 6, PESHE 6, p. 117 (ISSN 21950776)

Other presentations I gave in 2017 were "La evolución del cerebro en Homo desde hace dos millones de años," in MUPANTQUAT seminar *Evolución del Cerebro Humana y la Arqueología Cognitiva*, Real Casino de Murcia, Murcia, Sept. 30-Oct. 1, 2017 (publication in preparation); June 17, "Nuevas perspectivas sobre la Paleoantropología en la Región de Murcia: La Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz) y la Sima de las Palomas del Cabezo Gordo (Torre Pacheco)," in seminar series *Nuevas Perspectivas del Paleolítico del Sudeste Peninsular*, Cartagena and Torre Pacheco, June 16-18 2017, organized by Universidad Nacional de Educación a Distancia; Excmº.Aytº. de Torre Pacheco; and Excmº.Aytº. de Cartagena; and March 13, "Evolución y desarrollo del Cerebro Humano," in *XIV Conmemoración de la Semana del Cerebro en Murcia 2017*, Real Academia de Medicina de Murcia, March 13-17, 2017.

In 2016 I presented a paper on behalf our research team in the Human Evolution section of the Intercongress of the International Union of Anthropological and Ethnographical Sciences, held at Dubrovnik (Croatia) during May 4-6 2016, which was published in *Human Evolution* vol. 31, pp. 1-67, 2016. It was gratifying that archivist, archaeologist and photographer Daniel Borosa from Zagreb, a former Sima de las Palomas team member, joined the presenter Michael Walker at Dubrovnik. The talk was entitled: "A view from a cave:Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz,Murcia,southeastern Spain). Reflections on fire,technological diversity,environmental exploitation, and palaeoanthropological approaches" and you can read the full text in *Human Evolution* 31: 1-67.

In 2016 I participated as coauthor, along with other MUPANTQUAT members, in two posters that were presented by research colleagues from France and Germany, respectively, at the 6<sup>th</sup> Annual Meeting, held at Alcalá de Henares near Madrid, of the European Society for the Study of Human Evolution to which I belong (the posters are in this Briefing for you to study). I was unable to attend because our ESHE meeting clashed with dates on which I had undertaken to give three talks at an international summer school workshop. This was organized by our friend Dr Héctor Manrique, an evolutionary psychologist, who in both 2015 and 2016 gave our Field School talks on his research into how gorillas and chimpanzees use tools. His work was carried out during his PhD research at the celebrated Max-Planck Institute for Evolutionary Anthropology at Leipzig in Germany. Subsequently he taught at the University of the Balearic Islands, and in 2015 took up a lectureship in evolutionary psychology at Saragossa University and was assigned to its Teruel campus. This was where the 2016 summer school workshop was held on "*The journey of the evolving mind: Brain and behavioural evolution in great apes and extinct human ancestors*". I gave 3 talks: "Stone tools and the origins and evolution of early human technology: affordances, constraints, memory", "Observational learning and evolution of the human brain: aspects of neurophysiology and neuroanatomy; mirror neurone circuitry and shared attention; the relation between working memory and long-term procedural memory; prospective memory and multitasking", and "On wishful thinking: Did Palaeolithic humans customarily engage in symbolic behaviour before 40,000 years ago?" Drs Susana Carvalho and René Bobe from Oxford University gave talks, as did Héctor himself.

In 2015 I gave an invited talk at Merton College of Oxford University to the 5th *Unravelling the Palaeolithic* conference. My talk was "*Drawing neuroscience and palaeoanthropology together. Palaeoneurophysiology and cognitive evolution in Pleistocene Homo*". A full version has just been published in English under the title "*Drawing neuroscience and palaeoanthropology together. Palaeoneurophysiology and cognitive evolution in Early Pleistocene Homo: Biological and palaeoanthropological perspectives on the role of "haptic" working memory in the evolution of procedural long-term memory*", pp. 177-193 in: Ribot F. (Ed.), *Homenaje al Dr. José Gibert Clols. Una vida dedicada a la ciencia y a los primeros europeos* (Publicaciones de la Diputación de Granada, Granada, Spain).

At the Oxford Unravelling the Palaeolithic conference I also showed two posters that I had put up two weeks before at the 57th Annual Meeting, held at Heidenheim in Germany, of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age to which I belong. The posters with coauthors who are members of MUPANTQUAT and our research colleagues are given in this Briefing for you to view: "*Neanderthal attention to the dead at Sima de las Palomas del Cabezo Gordo (Murcia, Spain)*" and "*Playing with fire: evidence of fire at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar, Caravaca de la Cruz, Murcia, Spain*"). I returned to Oxford in October 2015 because our young MUPANTQUAT member Gonzalo Linares Matás who was reading Archaeology there chaired the Oxford University Archaeological Society and invited me to talk to it at the Oxford University Institute of Archaeology on "*The earliest Palaeolithic fire in Europe: Cueva Negra del Estrecho del Río Quípar*".

In 2014 I had also been busy. I was invited to present "*Stone procurement and transport at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Murcia, SE Spain)*" at the 55<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age held in April at the Braunschweig Landesmuseum in Germany. In early June I was Benjamin Meaker Visiting Professor at Bristol University, thanks to a joint research project with Bristol's Professor of Archaeology Kate Robson-Brown, and I gave both a public lecture "*Archaeological excavations at Sima de las Palomas del Cabezo Gordo (Murcia, SE Spain) and palaeoanthropological research into its 50,000 year-old Neanderthal remains*" and a research seminar on "*Cognitive evolution in Pleistocene Homo: Biological and palaeoanthropological perspectives on the role of "haptic" working memory in the evolution of long-term procedural memory*". During my stay in England in June I was invited to talk about our Murcian research at Archaeology Departments at other English universities and I lectured on "*Pre-Neanderthals and Neanderthals: 25 years of research at Cueva Negra del Estrecho del Río Quípar and Sima de las Palomas del Cabezo Gordo (Murcia, Spain)*" at the universities of Reading, York, University College London and Oxford. On returning to Spain I gave a public talk at Torre Pacheco about the Neanderthal family of nearby Sima de las Palomas.

After the 2014 excavation campaign I was on the road once more. Early September saw Spain host the XVII Congress of the International Union of Prehistoric and Protohistoric Sciences (held in a different country every five years). It was held at Burgos University with visits to the nearby Atapuerca sites for the 1,800 Congress participants. I gave two invited talks, namely, "*Hominin activities ~0.8 Ma at Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, SE Spain): Fire, technological diversity, environmental exploitation*" and "*Evidence of fire at the late Early Pleistocene Palaeolithic and hominin site of Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, SE Spain)*" and also presented the poster "*Neanderthal attention to the dead at Sima de las Palomas del Cabezo Gordo (Murcia, Spain)*". Later that month, at Florence University in Italy, I presented the talk "*Evidence of fire etc...*" at 4<sup>th</sup> Annual Meeting of the European Society for the Study of Human Evolution. In October I was in Italy again, and spoke on "*Palaeoneurophysiology and cognitive evolution in Pleistocene Homo: Biological and palaeoanthropological perspectives on the role of "haptic" working memory in the evolution of long-term procedural memory*" at the meeting *What Made Us Human* held at the Fondazione Ettore Majorana e Centro di Cultura Scientifica, at Erice in Sicily. While I was there I was invited to give an extended

version of that talk as a seminar to the Journal Club of the Psychology Faculty at the University of the Balearic Islands at Palma on Majorca, in November.

In April 2013 I gave an invited talk about “*The Sima de las Palomas Neanderthals*” at the 55<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age, held at Vienna’s imposing Natural History Museum, and in April 2012 I addressed the 54<sup>th</sup> Annual Meeting on “*Fossil Man in SE Spain*” at the Toulouse Natural History Museum. In June 2011 I presented a paper about both our sites in a monographic seminar on *Neanderthals in the Iberian Peninsula* during the XVII Congress of the Spanish Physical Anthropological Society held at Barcelona University, and in November I presented a paper on each of our sites during a week-long series of lectures on regional archaeology at Murcia’s Archaeological Museum. In September 2010 I gave a lecture about Cueva Negra during the Sixteenth Annual Meeting of the European Association of Archaeologists at the Hague in a Session on Palaeolithic Chronologies which I co-organized with Oxford’s Dr Tom Higham. In September 2009 I gave a lecture about Sima de las Palomas during the Fifteenth Annual Meeting of the European Association of Archaeologists at Riva del Garda, Italy, in a Session on the Middle and Upper Palaeolithic. In 2009 I also gave lectures about both our sites at the Society of Antiquaries of London of which I am a Fellow, and also at meetings in Spain, namely, at a symposium organized at Murcia by a leading bank here in honour of Charles Darwin, as well as at the Universidad Miguel Hernández at Elche, at the Cieza Museum in Murcia, and a lecture about Human Evolution at Murcia’s Science and Water Resources Museum. In 2008 I gave public lectures about the sites at the Murcian Archaeological Museum in a series of lectures organized in association with an exhibition of the region’s palaeontology, and another at a symposium at Orce, Granada, in honour of the late Dr Josep Gibert.

During the past decade I directed the scientific content of a travelling European Union public exhibition about our sites and research at them, called “*Archaic Europeans and Neanderthals: Project HOMO, Hominids, Technology and Environment in the Middle and early Upper Pleistocene*”, which is all about our work at Cueva Negra and Sima de las Palomas, and is now travelling around the European Union, because it won financial support from the European Commission’s “Culture 2000” Programme (2000-0820CLTCA1A) so that the Commission paid for half (€150,000 euros) of its cost, the other half coming from the participating institutions that have agreed to display it, namely Murcia’s Museo de la Ciencia y del Agua (Science and Water Resources Museum), the Austrian national Museum of Natural History at Vienna (where the exhibition opened in October 2001), the Palaeontological Museum of Barcelona at Sabadell, the Oxford University Museum of Natural History (where it was on show between September 19<sup>th</sup> and Christmas, 2002), and the town council of Torre Pacheco in Murcia where it went on show on February 23<sup>rd</sup> 2003 and where it is now back on show in 2005. Later in 2003 it went to Logroño in northern Spain, coinciding unfortunately with the start of our Cueva Negra excavation in July. However, when in October it went for six months to the splendid Science Museum at San Sebastián in northern Spain’s Basque Country, I gave a lecture to accompany the opening there. Later in 2004 it was shown in the spacious foyer of Murcia University Library for three months and in the Autumn of 2004 it visited a town in Murcia called Abarán at the invitation of the mayors of 6 towns who clubbed together to show it. In each case I have been present to introduce the opening to gatherings of the general public. This exhibition is giving research at our two sites great publicity around Europe – it receives hundreds of visits from groups of high school students in all the centres where it is on display. You may perhaps still be able to open up a slot on the web about it at <<http://www.contraplano.es/homo>>

In April 2007 I gave a talk about our research at Sima de las Palomas and Cueva Negra at the invitation of Professor Svante Paabo, the internationally renowned geneticist who conducts research into both mitochondrial and nuclear DNA from Neanderthal bones, who is the Director of the ultra-modern, seven-storey-high, Max-Planck Institute for Evolutionary Anthropology at Leipzig in Germany, and whom I had first got to know at a meeting in Madrid back in 1993. The talk was well received and Svante Paabo made useful suggestions about how we might best excavate the *Sima de las Palomas* Neanderthal skeletal remains, wearing face-masks and surgical gloves, and putting the fossils into sterile containers. This we did in summer 2007 and in the autumn Svante’s PhD student, Oxford University Biology graduate (now Dr) Adrian Briggs, came to Murcia and we helped him as he extracted samples from our newly-excavated Neanderthal bones in a sterile operating theatre in Murcia University’s Veterinary Science Faculty. Later on, he reported back from Leipzig that our excavation technique had been so good that almost no modern human DNA contamination could be detected, though so far, alas, neither has any Neanderthal DNA been identified – possibly because too few samples were taken by him and they may have been too small anyway (less than 200 milligrams each) given the high ambient temperature at *Sima de las Palomas* which may predispose to break up of the nucleotide fragments of DNA.

In September 2006 I gave a presentation entitled “The Demise of the Mysterians” based on our Cueva Negra research, in Colloquium 13 (“The Earliest Inhabitants of Europe”) at the XV Congress of the International Union of Prehistoric and Protohistoric Sciences at Lisbon. In November 2005 I gave a lecture about our work at Cueva Negra and Sima de las Palomas at Oxford University’s Institute of Archaeology in its Quaternary Seminar Series. In February 2006 I gave lectures on that work at Barcelona University and at Castellón.

My European travels in 2004 (see above) in order to gain support for the projected regional Museum for Paleontology and Human Evolution took up much of my spare time and energy that year, to the exclusion of other activities such as delivering public lectures, other than to local meetings of archaeologists and anthropologists at Murcia. I gave an invited lecture about our research at Oxford University’s Institute of Archaeology in November 2005. I gave a public lecture at the San Sebastián Science Museum in October 2003 and in February 2002 I gave one at Murcia’s Science and Water Resources Museum. In 2001 I gave several public lectures at places which included Oxford University, the XIV International Congress of Prehistoric and Protohistoric Sciences which was held at Liège in Belgium, at the Austrian national Natural History Museum in Vienna. In November 2000, I gave a major lecture about human evolution during the Middle and earlier Upper Pleistocene, at an international scientific meeting in Valencia organized by the Spanish governmental institution known as the Menéndez Pelayo International University. Other participants included Professor Bernard Wood of the Washington University and Professor Günter Bräuer of Hamburg University, as well as Mexican and Spanish scientists, including Emeritus Professor Emiliano Aguirre.

In 2000 national governmental recognition of our field research, by granting us R&D Project PB98-045, assisted us to acquire new international contacts and collaboration, as well as maintaining pre-existing ones, and most particularly favoured our obtaining the royal patronage of His Majesty King Juan Carlos I of Spain who graciously accepted Honorary Chairmanship for the (December 6-19, 2000) *International Colloquium and Workshop “The Iberian Peninsula and Human Evolution”, A Symposium in Honour of Professor Phillip V. Tobias, F.R.S.”* which I organized at Murcia. Professor Tobias, who was 75 in 2000, flew to Murcia from South Africa to take

part, where he is Emeritus Professor of the Witwatersrand University at Johannesburg and still directs its Palaeoanthropology Research Group. He is a frequent visitor to Spain. He gave a splendid address on "The role of water in the extra-African dispersal of humanity, with special reference to the peopling of the Iberian Peninsula." The programme included official visits to our sites of the Sima de las Palomas of Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar, on which I also gave an address entitled "Neanderthal Man in Murcia: Cueva Negra del Estrecho del Río Quípar and Sima de las Palomas del Cabezo Gordo."

Other participants gave addresses as follows. Professor Geoffrey A. Clark of the University of Arizona State University gave an address on "Modern human origins research: putting Iberia in a global context." Professor Derek A. Roe of Oxford University gave an address on "The Iberian Peninsula in the Palaeolithic: an outsider's view." The orthodontal surgeon and dental anthropologist Dr Vincent A. Lombardi, from Pittsburgh, gave an address on "Dental anthropology and Neanderthal Man." Drs Joao Zilhao and Cidalia Duarte of the Portuguese government's Archaeological Institute gave an address on "The Lagar Velho child: burial anatomy and implications for modern human origins in Iberia." Professor Camilo José Cela Conde of the University of the Balearic Islands, a Fellow of the American Association for the Advancement of Science, gave an address on "Just how stupid was *Homo habilis*? Problems over a suitable taxonomy of Pliocene hominins." Dr José Gibert Clols of the "Dr M. Crusafont" Palaeontological Institute of Barcelona gave an address on "Cueva Victoria at Llano del Beal, Cartagena, Murcia". Professor Enrique García Olivares of Granada University gave an address on "Molecular palaeontology: The study of biomolecules in fossils." Professor Daniel Turbón of Barcelona University gave an address on "Ancient DNA in the Iberian Peninsula". Professor José Enrique Egocheaga of Oviedo University gave an address on "Preliminary results of palaeoanthropological research into the Cueva de El Sidrón Neanderthals." Professor Ignacio Martínez of Madrid's Complutensian University gave an address on "The evolution of mind" on behalf of himself and Professor Juan Luis Arsuaga (who at the last minute was unable to attend because of another pressing commitment).

In 1997 I gave invited lectures to the Spanish National Archaeological Congress, at Harvard's Peabody Museum, and at University College London's Institute of Archaeology, while in 1996 I gave a lectures at Oxford University's "Baden-Powell" Quaternary Research Centre, at the *International Symposium in Honour of Professor Phillip Tobias FRS* held at the University of the Balearic Islands at Palma de Mallorca, and at the Cartagena Cultural Centre at Cartagena, as well as during a week-long Murcia University Summer School to 40 international students on *Human Evolution and Palaeoanthropology* in September at which other leading Spanish scientists took part (Professors Emiliano Aguirre, Daniel Turbón, José Gibert and José Camilo Cela Conde) as well as other junior researchers (Drs Francesc Ribot and Miguel Martínez Andreu, Ms Florentina Sánchez, and Mr. José Isaac Serrano). In 1995 I gave two public lectures at the invitation of the municipal authorities of Torre Pacheco and another lecture and an exhibition at the invitation of those of Caravaca. I also gave invited scientific lectures at the Murcian Regional Archaeological Week (two lectures and an exhibition), at the Autonomous University of Barcelona (a lecture), at Barcelona University (a lecture), and at the *International Conference on Human Palaeontology* at Orce (two lectures and an exhibition, and I also guided an excursion to *Sima de las Palomas*). I also organized an exhibition at Murcia University's "Biology Week" and a guided excursion to *Sima de las Palomas* for Murcia University's Summer School on "Archaeology of Death". In 1994 I gave several lectures on the two sites in England during my period as Oxford University Visiting Senior Research Fellow in Archaeology (3 in Oxford, one at the Natural History Museum in London, another at London University and yet another at Liverpool University. In most years since 1991, I addressed the Murcia regional government's week-long symposium held at Murcia at which archaeological field research during the previous twelve months was presented in public, though the annual symposium has now ceased to be held.

## **SOME ENGLISH PUBLICATIONS ABOUT OUR SITES:**

Since 2005 very important developments in research at both our sites have led to such significant changes in the way we understand them that most articles with publication dates earlier than 2008 are so out-of-date as to be now misleading in many respects (they can be found in my C.V. at the end of *Briefing You*); they have been wholly superseded by later publications of which the following are the main ones that we recommend (pdfs of most of these are available on request to us):

- 2018 (forthcoming, currently being edited by the publisher Oxbow Books in preparation for going to press in 2018). M.J.Walker (coordinator), *How the Earliest Cave-Folk of South-East Spain were Dug Up: A journey full of archaeological and anthropological surprises. A book put together by the team excavating under the direction of Michael J. Walker at the sites of Cueva Negra del Estrecho del Río Quípar (the Black Cave of the River Quípar gorge) near Caravaca de la Cruz, Murcia, Spain, and Sima de las Palomas del Cabezo Gordo (Dove Hole on Cabezo Gordo hill) near Torre Pacheco, Murcia, Spain*. Oxbow Books, Oxford.
- 2018 Submitted for publication to *Historical Biology*: A.López Jiménez, M. Haber Uriarte, M. López Martínez, M.J.Walker, "Small-mammal indicators of biochronology at Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, SE Spain)" (ISSN 15635236).
- 2018 Invited review submitted for publication to *Quaternary Science Reviews*: M.J.Walker, J.S.Carrión, "Background to Neanderthal presence in Western Mediterranean Europe" (ISSN: 0277-3791).
- 2017 E.Trinkaus, M.J.Walker, Eds., *The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain*. Texas A&M University Press, College Station, Texas, USA (ISBN 9781623494803).
- 2017 M.J. Walker, *Palaeolithic Pioneers, Behaviour, Abilities, and Activity of Early Homo in European Landscapes around the Western Mediterranean Basin ~1.3-0.05 Ma*. Archaeopress, Oxford, UK. (ISBN 9781784916206. e-book ISBN 9781784916213). (Refers to Cueva Negra.)
- 2017 H.M. Manrique, M.J.Walker, *Early Evolution of Human Memory. Great Apes, Tool-making, and Cognition*. "Palgrave Pivot", Palgrave Macmillan - Springer Nature, New York (ISBN 9783319644462, e-book ISBN 9783319644479). (Refers to Cueva Negra.)
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- 2017 G.Linares-Matás, J.Yravedra, I.Martín-Lerma, J.Aramendi, L.Courtenay, M.A.Maté-González, M.Haber-Uriarte, M.López-Martínez, M.J.Walker, "Preliminary taphonomical assessment of the macromammalian zooarchaeological assemblage at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, Spain)," *Proceedings of the European Society for the Study of Human Evolution 6 (PESHE 6)*, p. 117 (ISSN 21950776).

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- 2014 M.J.Walker, M.López Martínez, M.Haber Uriarte,:2014, "Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)" Pp. 410-413 in R.Sala Ramos (ed; with coordinators E.Carbonell, J.M.Bermúdez de Castro, J.L.Arsuaga) *Pleistocene and Holocene Hunter-Gatherers in Iberia and the Gibraltar Strait: The Current Archaeological Record*. (Burgos, Universidad de Burgos and Fundación Atapuerca, ISBN 9788492681, available as e-book 9788492681884).
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You can access the two ACyT articles in one on-line edition at the Asociación Española de Científicos web-site:  
<http://www.aecientificos.es> and then click on Artículos de Interés Científico (or go directly to  
[2010 M.J.Walker, A.V.Lombardi, J.Zapata, E.Trinkaus: "Neandertal mandibles from the Sima de las Palomas del Cabezo Gordo, Murcia, southeastern Spain" \*American Journal of Physical Anthropology\* 142: 261-272 \(ISSN 0002-9483\).  
2009 M.J.Walker: "Chapter 7. Long-term memory and Middle Pleistocene 'Mysterians'" Pp. 75-84 in S.A.de Beaune, F.L.Coolidge, T.Wynn \(eds\), \*Cognitive Archaeology And Human Evolution\*. New York, Cambridge University Press \(ISBN 0521746116\).  
2009 M.J.Walker: "La Sima de las Palomas del Cabezo Gordo en Torre Pacheco y la Cueva Negra del Estrecho del Río Quípar en Caravaca de la Cruz: dos ventanas sobre la vida y la muerte del hombre fósil en Murcia" pp. 71- 96 in T.Ferrández Verdú, F.Almarcha Martínez \(coordinators\) \*Darwin y la Evolución Humana. 1 Jornadas sobre Evolución Humana, 24 y 25 de abril de 2009, CEMACAM Torre Guil, Murcia\*, \(Murcia, Caja Mediterreáneo\) \(Depósito legal MU-2660-2009\).  
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2008 M.J. Walker, J.Gibert, M.V. López, A.V. Lombardi, A. Pérez-Pérez, J. Zapata, J. Ortega, T. Higham, A. Pike, J-L. Schwenninger, J. Zilhão, E. Trinkaus, "Late Neandertals in Southeastern Iberia: Sima de las Palomas del Cabezo Gordo, Murcia, Spain" \*Proceedings of the National Academy of Sciences USA\* 105 \(52\): 20631-20636.](http://www.aecientificos.es/escaparate/verpagina.cgi?idpagina=20630480&refcompra=).</a></p></div><div data-bbox=)

## FIELD TRAINING

Topics covered by me in informal lectures, on-site briefings, and guided excursions to helpers and staff assistants include:

- \*\*\* excavation methodology and practice
- \*\*\* treatment and classification of finds
- \*\*\* fundamentals of hominin and human evolution
- \*\*\* Quaternary landscapes
- \*\*\* Palaeolithic archaeology and stone tools
- \*\*\* *Sima de las Palomas* and *Cueva Negra* in their context
- \*\*\* flora and fauna of the ice age
- \*\*\* field excursions to other Quaternary or archaeological sites, museums, and places of historical interest.

## YOUR SCHEDULED ACTIVITIES

Each 3-week period will begin on Day 1 (arrival day, Friday) with rendez-vous at Murcia-San Javier National Airport (we start and finish on Fridays because there are not only connecting *Iberia (Air Nostrum)* flights from Madrid and Barcelona on weekdays for intercontinental travellers arriving in Spain from the U.S.A, Australia or elsewhere (there often are no connecting *Iberia (Air Nostrum)* flights on Saturdays and Sundays), but also numerous low budget flights from the U.K. and some other E.U. countries. The following low budget airlines may fly in to Murcia-San Javier, or have flown recently (the economic crisis has led to a reduction in flights and companies flying to Murcia-San Javier): *Bmibaby* (from Birmingham), *Easy-Jet* (from London-Gatwick and Bristol), *Flybe* (from Birmingham, Exeter, Southampton, and Norwich), *Flyglobespan* (from Edinburgh), *Jet2.com* (from Edinburgh, Blackpool, Leeds-Bradford, and Newcastle), *Virgin Express* (from Brussels), *Ryanair* (Dublin, London-Stansted, London-Luton, Bremen, Glasgow-Prestwick, Liverpool, Nottingham-East Midlands). We do not know which airlines will be flying still in June-July 2018 let alone their schedules.

If helpers so wish, Day 2 (Saturday) will be devoted to orientation, settling in, visiting the site, and free time when you can shop and get to know the town where they are based: namely, *Caravaca de la Cruz* (first period); and *Dolores de Pacheco* or nearby seaside towns such as *Santiago de la Ribera*, *Los Narejos* or *Los Alcazares* (second period). However, we have usually found that many helpers, after getting to the site by mid-morning on Day 2, prefer to get stuck in straightaway by working lightly there until lunch-time, and then to have half a morning free on some other day in order to buy gifts at stalls in the popular out-door weekly markets that are held in every Spanish village, town and city (just as in many other European countries) because their prices are often lower than in the shops (which, of course, are also open for shopping at the same time) - there are no nearby out-door markets on Day 2 (Friday). Each group will therefore be asked how it prefers to have Day 2 and its wishes will be respected.

Days 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 (Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday) are all potential working days, though we shall most certainly have some excursions and rest days among them! We often work on Saturday and Sunday so as to prevent a possibility of interference with our unattended excavation equipment by uninvited weekend visitors and day-trippers in our absence. However, one day in each three-week period will be used for day-long excursions to sites of interest. The first one will probably be a visit to mesolithic rock paintings in Murcia or Albacete. The second one will probably be a visit to *Cartagena* and perhaps *Cueva Victoria* or, if they prefer, the city of *Murcia*. Day 22 (Friday) is departure day (when there will probably be a chance in the morning for helpers at *Cueva Negra* to visit *Sima de las Palomas* provided their flight back home from Murcia-San Javier Airport is after lunch).

Also, we do find it sporadically necessary to have a rest and recreation (R&R) day, particularly in the second period for the benefit of the senior site helpers who needs a little time to themselves after having already been some weeks in the field at everybody's beck and call. On these R&R days, other helpers may explore their surroundings by themselves (we can tell them how to hire cars should they wish to do so and lend them maps) or simply laze the day away restfully and take their meals as usual. The P.I., the co-directors of excavation and senior site helpers from Murcia will not usually be available on such R&R days.

## DAILY SCHEDULE

A typical daily schedule of a working day might be roughly as follows:

- 07.00 Reveille
- 07.30 Light breakfast of coffee, bread roll, cereals, fruit juice.

07.45 Leave for site in vehicles  
 08.30 Begin work at site  
 11.00 *Mid-morning break for sandwich*  
 11.30 Restart work  
 13.45 Clean up at site, return to vehicles and to accomodation  
 14.15 Shower and change  
 15.15 *Luncheon*  
 15.45 Comments on day's work, briefing for next day  
 16.00 Siesta (afternoon nap)  
 17.30 Washing, ordering and bagging of finds  
 20.00 Informal talk, discussion, or free time  
 21.00 *Dinner*  
 21.45 Free time

I have followed a similar schedule in southeastern Spain since 1980 and find it well suited to the hot climate which is unsuitable for work between about 14.00 and 17.30 hours. It has been a successful schedule for archaeological excavations carried out at Murcia University for 30 years.

## **DAY-BY-DAY FIELD SCHOOL PROGRAMME AND TEAM DEVELOPMENT**

Team development is assisted by daily sessions after lunch when resumés of the day's activities and briefings for the next day can be commented on. The daily sessions after siesta when we are washing and sorting finds also bring everybody together in one place involved in common activities related to the finds from the day and sorting those which have dried out from the previous day. These work sessions may be followed by one of the three talks I give to each group: about the Project itself, about Plio-Pleistocene Human Evolution, and about the origin and evolution of Neanderthals. On other days, there is time for leisure and relaxation before dinner. On other than R&R days, and whenever administrative matters do not demand that I absent myself after 20.00 hours, I have tried to be present with the group upto and during Dinner and quite often I have joined with all our members after Dinner in visiting local entertainments. Increasingly administrative and representational obligations intrude on my time, when my co-directors María Haber and Mariano López take full charge. Very many senior site helpers join in after-dinner events and our new helpers usually have a good time with them.

It is anticipated that helpers will take part in guided excursions to archaeological and historical sites of interest. I have found these to offer excellent opportunities for group development in surroundings which provide a complete alternative to those of the work situation at our two sites. Everybody gets to know not only each other, but also something new, interesting and different. We try to take in local bars and eating places, and sample local food an wine.

The following gives a rough day-by-day idea of what the Field School programme will look like, though the final day-by-day programme will probably be finalized only in May or June 2018:

(Morning activities: 07.30-14.00 hours; afternoon activities: 17.30-21.00 hours)

### SESSION 1: June 29<sup>th</sup>-July 20<sup>th</sup> Cueva Negra excavation and Caravaca field base

#### Day 1 (Friday)

Afternoon/evening: Airport pick-up and transport to Caravaca field base.

#### Day 2

Morning: open and set up the Cueva Negra excavation.

Afternoon: talk about *The "Cueva Negra-Sima de las Palomas" Research Project* (Michael Walker).

#### Day 3

Morning: excavation at Cueva Negra; instruction in field techniques, wet-sieving, recording finds, etc.

Afternoon: showing of animated film "Cueva Negra"; instruction in field lab; sorting finds.

#### Day 4

Morning: excavation at Cueva Negra; instruction in field techniques, wet-sieving, recording finds, etc.

Afternoon: free time (no afternoon lab).

#### Day 5

Morning: excavation at Cueva Negra; visit to Roman temple remains at nearby La Encarnación.

Afternoon: sorting finds in lab; talk-seminar on *Human Evolution from the Pliocene to the Middle Pleistocene* (Michael Walker).

#### Day 6

Morning: excavation at Cueva Negra; visit to chert outcrop 800 m from the cave.

Afternoon: sorting finds in lab; brief talk about excavating the Caravaca *Camino del Molino Neolithic burial chamber with 1,300 crania and skeletal remains* (María Haber and Mariano López).

#### Day 7

Morning: excavation at Cueva Negra; anyone wanting to go shopping at Caravaca's open market can be taken into town at 10.30 am.

Afternoon: free time (no afternoon lab); optional excursion to collect chert at Collado del Gitano outcrop.

#### Day 8

Morning: excavation at Cueva Negra.

Afternoon: seminar *Faunal Remains and Biostratigraphy at Cueva Negra* (Antonio López, Azucena Avilés, Ángel Buitrago); sorting finds in lab.

#### Day 9

Excursion to see prehistoric rock paintings; picnic lunch at Nerpio swimming pool (no morning excavation, no afternoon lab).

#### Day 10

Morning: excavation at Cueva Negra.

Afternoon: workshop on *Flint-knapping* (Mariano López Martínez); sorting finds in lab.

#### Day 11

Morning: excavation at Cueva Negra.

Afternoon: seminar on *The Evolution of the Human Brain and of the Early and Middle Pálaeolithic* (Michael Walker); sorting finds in lab.

#### Day 12

Morning: excavation at Cueva Negra.

Afternoon: seminar on *Use-wear Analysis and Stone Tools* (Ignacio Martín); sorting finds in lab.

Day 13

Morning: excavation at Cueva Negra.

Afternoon: sorting finds in lab.

Day 14

Free time all day (no morning excavation; no afternoon lab)

Day 15

Morning: excavation at Cueva Negra.

Afternoon: seminar on *Pollen Analysis and Quaternary Climate* (José Carrión and Santiago Fernández); sorting finds in lab

Day 16

Morning: excavation at Cueva Negra.

Afternoon: sorting finds in lab.

Day 17 (Sunday Jul 16)

Morning: *Open Day* at Cueva Negra.

Afternoon: free time (no afternoon lab).

Day 18

Morning: excavation at Cueva Negra; Press Conference Meet-the-Media at Cueva Negra.

Afternoon: seminar on *Fire and Flint at Cueva Negra* (Michael Walker); sorting finds in lab.

Day 19

Morning: excavation at Cueva Negra.

Afternoon: sorting finds in lab.

Day 20

Morning: excavation at Cueva Negra.

Afternoon: inspection of flint tools from Cueva Negra at Caravaca Municipal Archaeological Museum; sorting finds in lab.

Day 21

Close up excavation and field lab; take down and pack up equipment and finds; Open Round Table of staff and helpers to evaluate Session 1.

Day 22 (Friday)

Helpers who are leaving are taken to see Sima de las Palomas and then to the airport. Finds are taken to Murcia and equipment to Dolores de Pacheco.

SESSION 2: July 20<sup>th</sup>–August 10<sup>th</sup> at Sima de las Palomas excavation and Dolores de Pacheco field base

Day 1 (Friday = Day 22 of Session 1) Airport pick-up and transport to Dolores de Pacheco field base.

Day 2

Morning: open and set up the Sima de las Palomas excavation.

Afternoon: talk about *The “Cueva Negra-Sima de las Palomas” Research Project* (Michael Walker).

Day 3

Morning: excavation at Sima de las Palomas; instruction in field techniques, wet sieving, recording finds.

Afternoon: instruction in field lab; sorting finds.

Day 4

Morning: short excavation (8-10.30am) at Sima de las Palomas; excursion to Cueva Negra for whoever has never been there before.

Afternoon: seminar on *Cleaning and Scanning the Sima de las Palomas Neanderthal Skeletons* (Jon Ortega); sorting finds in lab.

Day 5

Morning: excavation at Sima de las Palomas; instruction in field techniques, wet-sieving, recording finds, etc.

Afternoon: seminar on *Use-wear Analysis and Stone Tools* (Ignacio Martín); sorting finds in lab.

Day 6

Morning: excavation at Sima de las Palomas; instruction in field techniques, wet-sieving, recording finds, etc.

Afternoon: sorting finds in lab; *Faunal Remains from Sima de las Palomas* (Antonio López, Azucena Avilés and Ángel Buitrago).

Day 7

Free time all day (no morning excavation; no afternoon lab)

Day 8

Morning: brief visit to new Museum of Palaeontology and Human Evolution; excavation at Sima de las Palomas.

Afternoon: sorting finds in lab.

Day 9

Morning: excavation at Sima de las Palomas.

Afternoon: sorting finds in lab; seminar on *The Neanderthals* (Michael Walker)

Day 10

Morning: excavation at Sima de las Palomas.

Afternoon: sorting finds in lab.

Day 11

Morning: excavation at Sima de las Palomas.

Afternoon: seminar on *Pollen Analysis and Quaternary Climate* (José Carrión and Santiago Fernández); sorting finds in lab

Day 12

Morning: excavation at Sima de las Palomas.

Afternoon: sorting finds in lab.

Day 13

Morning: excavation at Sima de las Palomas.

Afternoon: seminar on *Neanderthals in Spain* (María Haber); sorting finds in lab.

Day 14

Morning: excavation at Sima de las Palomas.

Afternoon: workshop on *Flint Knapping* (Mariano López); sorting finds in lab.

Day 15

Excursion to see archaeological sites and museums at Cartagena (no morning excavation, no afternoon lab).

## Day 16

Morning: excavation at Sima de las Palomas.

Afternoon: seminar on *What Ever Happened to the Neanderthals?* (Michael Walker); sorting finds in lab.

## Day 17 (Sunday Aug 6)

Morning: *Open Day* at Sima de las Palomas (free time for those helpers not required on site).

Afternoon: free time (no afternoon lab).

## Day 18

Morning: excavation at Sima de las Palomas.

Afternoon: showing of documentary "*Decoding Neanderthals*"; sorting finds in lab.

## Day 19

Morning: excavation at Sima de las Palomas; Press Conference with mayor of Torre Pacheco.

Afternoon: sorting finds in lab.

## Day 20

Morning: excavation at Sima de las Palomas; Press Conference with mayor of Torre Pacheco.

Afternoon: sorting finds in lab.

## Day 21

Morning: close up excavation and field lab; take down and pack up equipment and finds.

Afternoon: Open Round Table of staff and helpers to evaluate Session 2.

## Day 22 (Friday, Aug 11)

Morning: helpers who are leaving are taken to the airport; equipment and finds are taken to Murcia.

# YOUR ASSIGNMENTS

All our helpers are integrated into the project alongside staff assistants. Most senior site helpers are young university graduates or senior undergraduate students who have field experience at Palaeolithic sites, and most of them will be present for most of the six-week field season at our two sites. Their task includes assisting helpers who come for shorter periods or who have little or no prior experience in palaeolithic excavation.

The physical work of excavation is carried out in the morning. Morning assignments involve excavation, removing excavated material, and sieving it, as well as service tasks at the sites. Some heavy tasks, such as carrying bags of soil, are hard for some older participants, who may choose to carry out lighter tasks such as sieving or service tasks such as starting or stopping the water-pump.

Work assignments are usually given to task groups of between two and six members. These groups contain both senior site helpers and other helpers. Members of task groups are rotated during the morning, or from one morning to the next, so all members get a chance to participate in all aspects of the project if they wish.

Knowledge of basic Spanish is always helpful. Several of my senior site helpers speak English and helpers who come from overseas find all of them welcoming, friendly, helpful and patient. I do try to encourage those helpers who have no Spanish at all to help groups alongside those senior site helpers who can speak some English, wherever this is possible.

Don't feel bashful about trying out a few words of phrase-book Spanish! Much as I should like to be, I cannot be always on hand to answer every question that may occur to a helper, because some of my time is taken up giving instructions in Spanish to my senior site helpers or discussing scientific and technical issues with them or logistical matters that have your well-being as our aim. So please do make every effort, despite any language barrier, to address questions to senior site helpers or ask them for assistance, rather than bottling up your queries or worries to deluge the Principal Investigator (-me!) with them because his explanations can hold up the Project from moving forwards just so as to help one person to look backwards - they can put a brake on the work not just of the one anxious volunteer but of perhaps a dozen other people. So please do try to get to know the staff as well as just the Principal Investigator. Your efforts here will be greatly appreciated and should lead to a responsive social ambience both during working hours and leisure time.

Afternoon assignments involve washing materials found during the morning, arranging them for drying, and preliminary classification of materials which are dry (usually those found the day before). Helpers take part in these activities alongside staff assistants, who help them to recognize the principal categories of material finds, and how to help with their initial sorting and identification, in ways which greatly simplify later laboratory analysis of them.

Tasks do not change much over the duration of our field campaign, although the precise details of the ways in which the tasks are performed differ somewhat between the two sites because of their different topography.

Skills and talents which are useful to the project range from acquaintance with such intellectual disciplines as archaeology, physical anthropology, anatomy, geology, soil science or palaeontology, to such practical activities as draughtsmanship, photography, surveying, working with ropes, and familiarity with petrol-driven water-pumps, portable electricity generators, power drills or jack-hammers. We've incorporated some useful technical tips from helpers with engineering skills to others who go in for home mechanics or have built their own home...

# STAFF

**Our staff are members of the Murcian Association for the Study of Palaeoanthropology and the Quaternary (MUPANTQUAT) and the Murcia University Research Group “Quaternary Palaeoecology, Palaeoanthropology and Technology”; many are coauthors of our recently published articles in major scientific journals about *Cueva Negra* and *Sima de las Palomas*.**

**Michael J. Walker, DPhil.** Field School Director. Director of excavations at *Cueva Negra* and *Sima de las Palomas*. I began field research at the sites in 1990 and I am Principal Investigator and direct the Project overall. I aim to be present with you all during working and instruction hours, often from eight o'clock in the morning to about eight o'clock in the evening, at least. I am a physical anthropologist, palaeoanthropologist and prehistoric archaeologist. I trained in Medicine, Physiology and Prehistoric Archaeology at Oxford University. After being Research Fellow in Archaeology at Oxford's The Queens' College, I lectured at Edinburgh and Sydney Universities before appointment in 1988 as foundation professor of Physical Anthropology at Murcia University which in 2011 named me Emeritus Professor. I chair of the Murcian Association for the Study of Palaeoanthropology and the Quaternary, MUPANTQUAT. In Murcia I have excavated sites of the initial Iron Age, Copper Age, and Mesolithic-Neolithic transition, and conducted fieldwork on Quaternary landscapes. For more details go to the end of **BRIEFING YOU** where you will find **YOUR FIELD SCHOOL DIRECTOR, AS SEEN BY HIMSELF Michael Walker and his curriculum vitae**.

**Mariano V. López-Martínez.** Co-director of excavations at *Cueva Negra* since 2002 and at *Sima de las Palomas* since 2008. Murcia University graduate in History and Geography with specialization in Prehistory, Archaeology and Ancient History, and took the 1-year postgraduate course in Palaeoanthropology in 1994 when he first helped at the *Cueva Negra* and *Sima de las Palomas* excavations. In 2001 he played a major part in preparing the European Commission-sponsored travelling exhibition about our two sites that opened at Vienna's Natural History Museum before being displayed at the Oxford University Natural History Museum and several museums in Spain. He is very much a "hands-on" archaeologist with wide practical experience of field and contract archaeology, directing rescue excavations, and displaying the results. In addition to our Palaeolithic excavations he has conducted work at Mediaeval, Roman and other sites, including excavation of the important Camino del Molino Copper-Age burial chamber at Caravaca, Murcia; see Lomba, J., López-Martínez, M., Ramos F. & Avilés, A., 2009, *Trabajos de Prehistoria* 66 (2) pp. 143-159, ISSN: 0082-5638, eISSN: 1988-3218). In November 2015 he gave a talk on "Cueva Negra de Caravaca. El fuego más antiguo de Europa" at the meeting "I Jornada de Arqueoturismo Tierra de Iberos" at Caravaca de la Cruz, and he published "20 años de excavaciones en la Sima de las Palomas del Cabezo Gordo" (M.López Martínez, M.J.Walker, M.Haber Uriarte) in *Orígenes y Raíces 8* (Sociedad de Estudios Historiológicos y Etnográficos) pp 1-6 (ISSN 2254-5). At our Field School he mainly is in day-to-day charge of excavation, on-site recording, and the inventory and registry of excavated finds. For his coauthorship of publications about *Cueva Negra* and *Sima de las Palomas* go to **SOME RECENT PUBLICATIONS ABOUT WORK AT OUR SITES THAT MAY WELL INTEREST YOU**.

**María Haber-Uriarte, PhD.** Co-director of excavations at *Cueva Negra* and *Sima de las Palomas* since 2010. She is an assistant lecturer at Murcia University's Department of Prehistory and Archaeology. She took her degree in archaeology at Salamanca University (1993) and subsequently studied physical anthropology at Granada University where her doctoral thesis (2003) was on Neanderthals in the Iberian Peninsula. She has wide field experience in contract and rescue archaeology, including excavation and physical anthropological analysis of the important Camino del Molino Copper-Age burial chamber at Caravaca, Murcia (see Avilés, A., Haber, M. & Lomba, J., 2012, pp. 106-108 in *Biodiversidad Humana y Evolución*, edited by Turbón, Fañanás, Rissoch & Rosa, University of Barcelona, ISBN: 9788469563229, 9788469563236). For her coauthorship of publications about *Cueva Negra* and *Sima de las Palomas* go to **SOME RECENT PUBLICATIONS ABOUT WORK AT OUR SITES THAT MAY WELL INTEREST YOU**.

**Ignacio Martín-Lerma, PhD.** He is an assistant lecturer at Murcia University's Department of Prehistory and Archaeology. Trained in archaeology at Murcia University, Madrid's National University for Distance Studies (where he is a member of its Palaeolithic Studies Laboratory), and Madrid's Autonomous University, his doctoral thesis was on experimental and microscopic use-wear analysis of stone artifacts. He has participated in the *Cueva Negra* and *Sima de las Palomas* research and is conducting use-wear analysis of their Palaeolithic stone tools. He has participated in major Palaeolithic excavation projects at *Cueva Antón* in Murcia (Mousterian), *Rambla Perea* in Murcia (Middle-to-Upper Palaeolithic), *Cueva Ambrosio* in Almería (Solutrean), *La Peña de Estebanvela* in Segovia (Magdalenian), *Cerro del Buho* in Murcia (Copper Age) and *Camino del Molino* in Murcia (Copper Age), and has also directed excavations and in 2017 hopes to conduct excavation at an Upper Palaeolithic in the Almadenes Gorge of the River Segura at Cieza in Murcia. Among his recent publications are: Gutiérrez Sáez, C., Llorente Rodríguez, L., **Martín Lerma, I.**, Bashore Acero, C., 2015, La industria ósea del sector 3C, *Cuadernos de Prehistoria y Arqueología de la Universidad Autónoma de Madrid*. 1 Anexo, pp. 23-38 (ISSN 02111608); Zilhao, J., Villaverde, V., Zapata, J., **Martín Lerma, I.**, 2015, *Cueva Antón* (Mula, Murcia), in *100 años de investigaciones arqueológicas en la Universidad de Murcia*, pp. 32-33 (Universidad de Murcia, ISBN 978846066907-4); **Martín Lerma, I.**, Cacho Quesada, C., 2014, Functional Analysis of a Magdalenian site from the Spanish Northern Meseta: a case study of endscrapers from la Peña de Estebanvela (Ayllón, Segovia), in J.Merreiros, N.Bico and J.Gibaja, Eds., *International Conference on Use-Wear Analysis*, Cambridge Scholars Publishing, pp. 249-263 (ISBN 1443868167); Gutiérrez Sáez, C., **Martín Lerma, I.**, Marín de Espinosa, J.A., Lomba Maurandi, J., 2014, Technology and function of the Chalcolithic dagger from Cabezos Viejos (Archena, Murcia, Spain), in J.Merreiros, N.Bico and J.Gibaja, Eds., *International Conference on Use-Wear Analysis*, Cambridge Scholars Publishing, pp. 755-763 (ISBN 1443868167); Gutiérrez Sáez, C., **Martín Lerma, I.**, López Del Estal, A., Bashore Acero, C., 2014, The functionality of Palmela Points as throwing weapons and projectiles: use-wear marks, in J.Merreiros, N.Bico and J.Gibaja, Eds., *International Conference on Use-Wear Analysis*, Cambridge Scholars Publishing, pp. 450-464, (ISBN 1443868167); Gutiérrez Sáez, C., **Martín Lerma, I.**, 2014, Traceology on metal. Use-wear marks on copper-based tools and weapons, in *Use-Wear and Residue Analysis in Archaeology*, "Manuals in Archaeological Method 10", Springer, pp. 171-188 (ISBN 9783319082561). He is coauthor of articles in *Trabajos de Prehistoria, Quaternary International* 272-273, 42-54, 2012, and on the forthcoming article in *Antiquity* on evidence for combustion at *Cueva Negra*, and has presented papers at national or international scientific meetings, talks, seminars and courses given at various universities, including recently in the *International Conference Retouching the Palaeolithic, Becoming Human and the Origins of Bone Tool Technology* (Schloss Herrenhause, Hannover, 21st-23rd October 2015), the *XI Congreso Ibérico de Arqueometría*, the 10th International Symposium on Knappable Materials at Barcelona University, the AWRANA Meeting 2015 at Leiden University, and 5 papers at the XVII World UISPP Congress at Burgos University in 2014. He also has produced 3 archaeological

documentary films ("Un encuentro con el pasado", 2008; "Experimentar para comprender: Tecnología del Paleolítico", 2010; "La vida a través de la muerte: Los enterramientos en la Prehistoria Reciente", 2013).

**Antonio López-Jiménez.** Murcia University Biology graduate. He is undertaking faunal analysis and micromammalian Pleistocene biostratigraphy, biochronology and palaeobiology at *Cueva Negra*. For the past ten years at our Field School he has coordinated preliminary preparation, cleaning and registry of faunal remains at *Cueva Negra* and *Sima de las Palomas*. For his coauthorship of publications about *Cueva Negra* and *Sima de las Palomas* go to **SOME RECENT PUBLICATIONS ABOUT WORK AT OUR SITES THAT MAY WELL INTEREST YOU**.

**Jon Ortega-Rodrigáñez.** Madrid Autonomous University Biology graduate. He is an expert in cleaning and identifying *Sima de las Palomas* Neanderthal skeletal remains. He has taken part in the *Cueva Negra* and *Sima de las Palomas* excavations for the past ten years and assists our helpers both on site and in the lab. For his coauthorship of publications about *Cueva Negra* and *Sima de las Palomas* go to **SOME RECENT PUBLICATIONS ABOUT WORK AT OUR SITES THAT MAY WELL INTEREST YOU**.

**Azucena Avilés-Fernández.** Murcia University Biology graduate with further study of physical anthropology at Granada University, who assists with skeletal analysis of human and faunal remains. She has taken part in the *Cueva Negra* and *Sima de las Palomas* excavations for the past ten years and assists our helpers both on site and in the lab. She has undertaken excavation and physical anthropological analysis at the important Camino del Molino Copper-Age burial chamber at Caravaca, Murcia; see Lomba, J., López-Martínez, M., Ramos, F., Avilés, A., 2009, *Trabajos de Prehistoria* 66 (2) pp. 143-159, ISSN: 0082-5638, eISSN: 1988-3218; Avilés, A., Haber, M., Lomba, J., 2012, pp. 106-108 in *Biodiversidad Humana y Evolución*, edited by Turbón, Fañanás, Rissoch & Rosa, University of Barcelona, ISBN: 9788469563229, 9788469563236). For her coauthorship of publications about *Cueva Negra* and *Sima de las Palomas* go to **SOME RECENT PUBLICATIONS ABOUT WORK AT OUR SITES THAT MAY WELL INTEREST YOU**. She is also among the 73 authors of the 2017 Creative Commons *bioRxiv* paper "The maternal genetic make-up of the Iberian Peninsula between the Neolithic and the Early Bronze Age" by Szécsény-Nagy et al. (*Scientific Reports* doi: 10.1038/s41598-017-15480-9).

**Ángel Tomás Buitrago-López.** Murcia University Biology graduate who assists with skeletal analysis of human and faunal remains. He has taken part in the *Cueva Negra* and *Sima de las Palomas* excavations for the past three years and assists our helpers both on site and in the lab.

**Consuelo Caravaca-Martínez.** Murcia University graduate in History and Archaeology and has a master's degree. She has undertaken supervisory duties at our sites in recent field seasons.

**Norman Fernández-Ruiz.** Murcia University graduate in History and Archaeology. His fine master's thesis presented at Alicante University in 2017 was based on important three-dimensional analysis of finds in a level of *Cueva Negra*. He has undertaken supervisory duties at our sites in recent field seasons.

**Hugo Cano-Fernández.** Murcia University Bioology undergraduate. He has undertaken supervisory duties at our sites in recent field seasons. He has developed a useful handbook for us about the identification of the bones and teeth of Quaternary mammals at our sites.

**Gonzalo Linares-Matás** is a Murcian who in 2017 graduated in Archaeology with First Class Honours at Oxford University where he presented a dissertation based on bone taphonomy at *Cueva Negra*. He is about to embark on a master's course. He has undertaken supervisory duties at our sites in recent field seasons. He founded and is the executive editor of the *International Journal of Student Research in Archaeology* (ISSN 2398-2012).

Our senior site helpers are young university graduates or senior undergraduate students who collaborate with me - some of them have already been named above, and there are other regular staffers who have worked with us for several years. There is roughly one senior site helper for each helper with little experience, so you are never left alone wondering just what you ought to be doing, because there is always someone alongside to help and show just what has to be done and how to do it.

At the Caravaca Ascruz public residential school we are very well looked after by our cooks, and its caretakers and cleaners. At Dolores de Pacheco we are also very well looked after by the caretaker and cleaners of the public school where we stay and sleep, and by the cooks Mariángelos and her husband Ginés at the Centro Cívico nearby where we take our meals.

At *Sima de las Palomas*, until his death in September 2007 I had as my co-director of excavations a geologist and palaeontologist, the late Dr Josep Gibert, who was both my good friend and a distinguished public-service research-scientist at the Instituto Paleontológico "Dr M.Crusafont" de la Diputación de Barcelona at Sabadell, a satellite city of Barcelona.

Several staff associates come to give talks, as well as scientific collaboration, in our Day-by-Day Field School Programme and Team Development Activities. Among them are our *MUPANTQUAT* Committee Member communications expert **Jesús García-Torres** who until 2016 taught at the Murcia Catholic "San Antonio" University who has had wide professional experience in the media, Murcia University Professor of Plant Evolution palaeopaleontologist **Dr José Carrión-García** and his team (which includes **Dr Santiago Fernández-Jiménez** and **Dr Manuel Muñoz**), **Dr Tomás Rodríguez-Estrella** who is Professor of Hydrogeology at the Cartagena Polytechnic University, palaeontologist **Dr Gregorio Romero Sánchez** of the Murcian Regional Government's Heritage Directorate-General, Murcia University analytical chemist **Dr Juan Luis Polo-Camacho**, and the archaeologist **Armando de Lucena** who works at local prehistoric rock-art sites and the Murcian Regional Centre for Rock-Art Interpretation at nearby Moratalla.

We have very many specialists in different disciplines at centres around the world who collaborate with us actively, and possibly one or two may visit our sites during our summer field season and if so they usually share their knowledge and experience with us in talks, seminars or field expertise on site. Some are old hands at our Field School and excavations, or long-standing scientific collaborators. Among them are archaeologist **Ian Herbertson** (currently undertaking a PhD at Reading University in England), Pittsburgh dental anthropologist **Dr Vince Lombardi** (one-time adjunct professor at Harvard University Dental School), British archaeologist and engineer

**John Simpson**, O.B.E., bioarchaeologist **Sara Rhodes** (currently undertaking a PhD at Tübingen University), geoarchaeologist **Dr Diego Angelucci** and his PhD student **Daniela Anesin** who sample sediment at our sites for micromorphological research at Trento University in Italy, Oxford University OSL Dating Laboratory head **Dr Jean-Luc Schwenninger**, physical anthropologist Dr Marco Milella from Zurich University Anthropology Institute, and the distinguished mammalian palaeontologist Dr Jan van der Made (Museo de Ciencias Naturales del Consejo Superior de Investigaciones Científicas, Madrid).

Among eminent scientific collaborators are the distinguished paleoanthropologists Professor Erik Trinkaus (Washington University of St. Louis), who is the leading authority on Neanderthal anatomy, and Professor Bernard Wood of the George Washington University of Washington DC whose publications on early *Homo* in Africa are world-famous. Another distinguished scientist is the palaeogeneticist Dr Svante Pääbo, (Director of the world-famous Max Planck Institute for Evolutionary Anthropology at Leipzig), who has sent members of his team to take samples during our *Sima de las Palomas* excavations. Likewise Dr Michael Richards (now Professor of Anthropology at the University of British Columbia, who until recently held senior appointments at Durham University and the Leipzig institute), an expert on research into stable isotopes that provide useful knowledge about Palaeolithic diets, visited us two years ago with his then PhD student, now Dr Domingo Carlos García-Salazar (Valencia University). Domingo Carlos is undertaking research at the Leipzig institute that is being directed by Dr Amanda Henry whose research team is studying phytoliths in Neanderthal dental calculus, as well as other biological residues, which tell us about plants eaten at *Sima de las Palomas*. Other members of her team, Dr Robert C. Power and Dr Cynthianne Spiteri, have taken samples our sites in 2012 and 2013 for Dr Henry's collaborative research project with us, and Dr Henry herself visited Murcia in 2011.

The eminent palaeoanthropologist Professor Chris Stringer (Natural History Museum London and London University Imperial College) follows our research keenly and he sent his Head of Conservation, Chris Collins, here to give us the benefit of his experience in cleaning fossils. Professor Kate Robson-Brown of Bristol University Archaeology Department and Dr Priscilla Bayle of PACEA Bordeaux University have undertaken microtomography of teeth and small bones, particularly of the *Sima de las Palomas* Neanderthals. We have had considerable advice and help with tomography (CAT scanning) of larger skeletal elements from Professor Christoph Zollikofer and Dr Marcia Ponce de León from Zurich University where they have received us to give help for continuing research on the scans. Dr Francisco Giles-Pacheco and Juan José López-Amador from the El Puerto de Santa María Museum gave us useful advice about suitable (CTS) vibroscalpels for cleaning the skeletons.

Other notable colleagues include thermoluminescence expert Dr Daniel Richter (the Leipzig Max-Planck Institute and Cologne University) and the expert on optically stimulated luminescence sediment dating Dr. Jean-Luc Schwenninger (Oxford University Research Laboratory for Archaeology and the History of Art, RLAHA), as well as the well-known radiocarbon dating specialist at RLAHA, Professor Tom Higham, uranium-series dating expert Dr Alistair Pike (formerly Bristol University, now Southampton University), Dr Jean-Luc Schwenninger (Optical Sediment Luminescence Laboratory at RLAHA), palaeomagnetism specialists Professor Gary Scott (Berkeley Geochronology Center) and Dr Lluís Gibert-Beatas (Barcelona University), cosmogenic nuclide dating expert Dr Régis Braucher (Laboratoire de Nucléides Cosmogéniques LN2C, CEREGE UMR 6635, CNRS, Aix-en-Provence), the specialist in Fourier-transform infra-red spectroscopic analysis of burnt remains Dr Francesco Berna (Simon Fraser University), the specialist in electron spin resonance analysis of burnt remains Dr Anne Skinner of Williams College Boston, and the expert in spectroscopic characterization of rare-earth and crustal elements Dr Alex Andronikov of Arizona University's Planetary and Lunar Laboratory.

Other relevant colleagues and collaborators include physical anthropologists Dr Alejandro Martínez-Pérez-Pérez (Barcelona University), Dr Kornelius Kupczik (Max Planck Institute for Evolutionary Anthropology at Leipzig) and Dr Josefina Zapata-Crespo (Murcia University), Palaeolithic archaeologists Emeritus Professor Derek Roe (Oxford University), Professor João Zilhão (Barcelona University), Emeritus Professor Nicolas Rolland (University of Victoria, Canada), Professor Wil Roebroeks (Leiden University) and Professor Tom Wynn (University of Colorado at Colorado Springs), anthracologist Dr Ernestina Badal (Valencia University), micromammalian palaeontologist Professor Antonio Ruiz-Bustos (Granada University), mammalian palaeontologists Dr Carles Ferrández (Barcelona University), reptile palaeontologist Dr Xaber Murélaga (University of the Basque Country), geomorphologist Dr. Yanni Gunnell (Lyons-2 University), archaeologist Professor Milton Núñez-Gilabert (Oulu University, Finland), archaeologist and physical anthropologist Dr Phillip Habgood (Queensland University), avian palaeontologist Anne Eastham (Cleddau Laboratory for Archaeozoology, Fishguard, Wales), archaeologist Miguel San Nicolás-del Toro (Instituto de Patrimonio Histórico, Comunidad Autónoma de Murcia), palaeoimmunology, and palaeobiochemistry expert Professor Enrique García-Olivares (Granada University).

## FIELD LOGISTICS

### **VERY IMPORTANT ADVICE TO AIR TRAVELLERS**

If you are flying into or out of Murcia Airport you need to bear in mind the following.

June 29<sup>th</sup> (Friday) ARRIVALS: We can pick you up at the airport at almost any hour of the day or evening on June 29<sup>th</sup> (Fri.) but, because the drive to our Caravaca base takes about 90 minutes, if you land late in the evening, say about 9 or 10 pm, we shall not be able to get you to Caravaca base until late at night, when the most we can offer you to eat may be a sandwich or two and a salad, as everyone else will have had a hot dinner at 9 pm. So, please try to take a flight that lands before 8 pm, but if the only one available for you lands later than that we shall do our best to pick you up provided you have informed us well beforehand.

July 20<sup>th</sup> (Friday) DEPARTURES: We cannot take anyone to the airport for flights out of Murcia that have a departure time earlier than 3 pm, so you should not book on a flight that departs earlier than 3 pm. Yes, indeed there are early morning flights out of Murcia, but if you book on one leaving early on July 20<sup>th</sup> you will have to take a private taxi from Caravaca at your own expense, which will cost you at least sixty or seventy euros. So, in order to avoid that expense, we can offer you an alternative solution if you must book on an early morning flight in order to make an international same-day connexion in, say, Madrid, Barcelona, London, etc., which is to book your early morning flight out of Murcia for July 21<sup>st</sup> and stay the night of the 20<sup>th</sup> with us at our Dolores de Pacheco base and either we can take you to the airport which is not far away or you can order a taxi which will be a lot less expensive than it would be from Caravaca, and you will not be charged for the extra night accommodation if you want to do that, but we need to know in advance, and certainly before June 29<sup>th</sup>, in order to be sure there

are enough beds available! After June 29<sup>th</sup> we are too busy excavating at Cueva Negra to be able to attend to deal with administrative matters concerning session 2 at Dolores de Pacheco.

July 20<sup>th</sup> (Friday) ARRIVALS: We can pick you up at the airport from 3 pm onwards and there is no problem about arriving at 9 or 10 pm as the airport is quite near to our Dolores de Pacheco base, though you will have to make do with a sandwich or two at that time of night. If you arrive at the airport in the morning you will have to hang around there in the cafeteria or waiting area until we turn up, which may be as early as at about 2 pm if someone from Session 1 has a flight departing at 3 pm, but otherwise it is unlikely to be earlier than 3 pm. Please let us know the arrival time of your plane well beforehand.

August 10<sup>th</sup> (Friday) DEPARTURES: As for July 20<sup>th</sup>, though because also our staff will be busy transporting excavation equipment and finds to various places during the day we may have to drop you off at the airport in the morning and you will then have to hang around there until whatever time in the afternoon or evening your flight leaves that you may have booked on.

If you would like to spend an pleasant extra night or two before or after any of the sessions, in order to enjoy a relaxing day by the beach after a tiring long journey, or after a gruelling excavation session with us, we recommend an inexpensive friendly 2-star hotel at Los Narejos which is about 2 km directly down a straight road from Murcia San Javier Airport, and therefore a cheap taxi ride; it is the Hotel Los Narejos where bed-and-breakfast costs about 45 euros, and you can also buy lunch or dinner in its dining room. Several of our helpers from other countries have stayed there and been well satisfied. It is about a quarter of a mile or 0.5 km from the beach. Because July and August are high holiday season months, when anything under 50 euros bed-and-breakfast is hard to find at coastal resorts like Los Narejos, you should book well in advance. Here are the details: Hotel Los Narejos, Avenida de la Constitución 67, Los Narejos, 30710 Los Alcázares, Murcia, tel. 34 968 57 56 34. It is quite easy for us to drop you off at this hotel instead of at the airport nearby if you are leaving us, or to pick you up at this hotel instead of at the airport if you are arriving, provided you have told us beforehand the dates of your hotel booking.

## RESEARCH AREA

Both *Cueva Negra* and *Sima de las Palomas* lie in the southeastern Spanish province of *Murcia*. It is a popular Summer tourist area, especially the *Mar Menor* ("Lesser Sea") which is a large coastal lagoon near to *Sima de las Palomas*. *Murcia* is extremely dry and its coastal region becomes very warm from mid-June to mid-September: by noon the temperature is usually 30-40° C (85-105° F.).

The region has a *Mediterranean* scrub vegetation and its aridity means that for the most part its hills and mountains are not covered by dense woodland but, instead, show rocky slopes and cliffs. The majestic hills and peaks emit the heady scented fragrance of thyme, juniper, laurel, fennel, marjoram, camomile and rosemary.

Little is left of the original wildlife, apart from occasional eagles, vultures, and, in the hinterland near *Cueva Negra* wild boar, and occasional wild deer and cats. For the most part, only occasional herds of sheep or goats move across the landscape. All the same, a few less pleasant animals lurk among the rocks, from stinging tarantula spiders and small scorpions to poisonous vipers. If you wear boots when you are not on footpaths, these little creatures will scurry away quickly, so don't worry!

Dramatic visual contrasts in the landscape are provided between the bright rock of steep hillsides and the lush green agricultural crops on valley floors which are oases maintained by irrigation canals from the *River Segura* and its tributaries.

These canals were first dug by *Syrian* engineers after this part of Spain fell under *Muslim* domination in the eighth century A.D., when *Islamic* soldiers crossed the *Gibraltar Strait* from *North Africa* and soon conquered most of Spain. The very name *Murcia* is an old Arabic word, "mursiyah", which means "Place of Waters". It is the name both of the self-governing political region and of its administrative capital which is a city of 400,000 people. It was the capital of an important Muslim emirate or kingdom. (Geographical coordinates for Murcia city are: Latitude 37° 58' 35.5296" or 37.97653574833937; Longitude -1° 5' 35.304" or -1.0931396484375.)

*Murcia* was an important Muslim kingdom until it was reconquered by Christian Spaniards in the thirteenth century. The reconquest is celebrated every year at *Caravaca de la Cruz* by a mock battle between Christian knights and Moorish soldiers. *Caravaca* was the summer capital of the Muslim kings, who retreated there from *Murcia* which is stiflingly hot and humid in the summer. Helpers at *Cueva Negra* can visit their palace and castle at *Caravaca* now also contains a beautiful church which was built to commemorate a vision there of a Holy Cross with two cross-bars (like the Cross of Lorraine in France) that supposedly helped convert the people to Christianity. *Caravaca* is at 500 metres above sea level, and is cooler than is *Murcia* at a mere 50 m above sea level. *Cueva Negra* is just under 15 kilometres from *Caravaca*, and is higher still, at 750 metres above sea level. On the hill above the cave there are the walls and house-foundations of a late prehistoric Iberian (Iron Age) town and of an Iberian and early Roman temple over part of which a small church was later built. Helpers at *Cueva Negra* can visit these. Not far away, at *Mula*, there was an important Iberian town and there is an excellent museum of Iberian finds.

*Murcia* was long famous for its *silk* industry, based on its rich orchards of mulberry trees, although that industry has died out over the past 100 years, to be replaced by fruit orchards and canneries. Murcian peaches are the sweetest in Europe. Murcian tomatoes, lemons, oranges, melons, and fruit and vegetables of all kinds, from avocado pears and quinces, to date palms, asparagus, artichokes, lettuces, grapes, almonds and olives, are trucked up the 900 kilometre-long motorway which links *Murcia* to France, Germany, Scandinavia and Russia. Many reach northern markets long before fruit in other *European Union* countries has even started to ripen. The first tomato crop is picked in *Murcia* at New Year, thanks to a very warm climate which is really an extension of that of *North Africa*.

After dividing at the city of *Murcia* one branch of the motorway goes to Andalusia and the other heads south to link *Murcia* both with its airport at *San Javier* 45 kilometres away and also its sea-port of *Cartagena*, which is a corruption of the name given to it by the Romans of "*Cartago Nova*" meaning "New Carthage". This reminds us that the port was founded by *Carthaginians* from *North Africa* more than two hundred years before Christ, and formed part of the *Hannibal's Punic Empire* before it came under the Roman heel. Long before Rome was important in the world, *Cartagena*'s enclosed natural harbour and its surrounding mountains rich in silver, lead and iron ores, were coveted by the *Carthaginians* who competed with Greece for control of Mediterranean sea-routes, because whereas the Greeks had silver mines for coinage near Athens itself, Tyre and Carthage had none. The Greeks established ports in Catalonia (Ampurias) and France (Marseilles), whereas Carthage maintained control of *Cartagena* until the Roman general Scipio besieged it and thereby also took control of its valuable silver mines.

To-day, *Cartagena* is the main port for the Spanish Navy and is an attractive city of 200,000 people with many remains of the Carthaginian and Roman periods which can be visited. They include part of the Carthaginian city wall built in 300 years before Christ, the Roman theatre, Roman house foundations and streets preserved as museums in the basements of modern buildings, part of the Byzantine city wall of 500 A.D., and much more besides. There is a breathtakingly splendid archaeological museum, a very attractive museum of maritime archaeology. It also has the world's first electrically-driven submarine, made in 1888 by Spanish naval engineer and inventor *Isaac Peral*, which weighs 80 tonnes, has 3 propellers and reached a speed of 7.7 knots. The city and its naval base were heavily fortified in the 18th century under King Carlos III, and his walls and forts dominate the hills and cliffs which enclose the superb natural harbour.

In the hills near *Cartagena* is another cave which was entered by miners, *Cueva Victoria*, where my friend, the late José Gibert excavated fossils in what was an Early Pleistocene hyaena den into which the carnivores brought one or two hominin bones, which are among the oldest in Europe (see "CV-0, an early Pleistocene human phalanx from Cueva Victoria (Cartagena, Spain)". J. Gibert, L. Gibert, F. Ribot, C. Ferrández-Cañadell, F. Sánchez, A. Iglesias, M.J. Walker, in *Journal of Human Evolution*, 2008), even older than those from *Atapuerca Cave* in northern Spain which only go back as far as the end of the Early Pleistocene 780,000 years ago. Helpers at Sima de las Palomas may have opportunities to visit *Cartagena* and perhaps *Cueva Victoria*, or they may prefer to visit the city of *Murcia* instead. The late Dr Josep Gibert also excavated Lower Pleistocene hominin and early Palaeolithic sites at *Orce* in northern Granada.

*Sima de las Palomas* is roughly 45 kilometres from both *Cartagena* and *Murcia*. *Murcia* has a magnificent cathedral with a splendid baroque west front and an enormous tower which offers a fine view of the city. 1994 was the 600th anniversary of the founding of the cathedral. The centres of both *Murcia* and *Cartagena* are narrow pedestrian thoroughfares which are always thronged with people. During Easter Week both cities have enormous religious processions which are often televised throughout Spain.

Both cities have a very wide range of bars and taverns, where the strong dry Murcian red wine from the *Jumilla* vineyards and wineries should be drunk straight from the cask, accompanied by the wide variety of *tapas* or snacks for which Murcian bars are rightly famous. However, every Murcian town is rich in bars, taverns and discotheques, which come alive at night after dinner, which during the Summer means after about eleven o'clock at night. They are still going strong and noisily at five o'clock in the morning. Helpers at *Caravaca* can sample a wide range of them there, and those at *Dolores de Pacheco* can do so at the seaside resorts of *Santiago de la Ribera* and *Los Alcazares*.

Lack of time, alas, means it may not always be possible for helpers to visit *Murcia* city itself. Should you wish to spend some time in the cities of *Murcia* and *Cartagena*, you could do what some other volunteers have done in the past, and come a few days early or stay on for a few days afterwards. Some of you may wish to visit the marvellous *Alhambra* palace at *Granada*, which can be reached by coach from *Murcia* though you will probably need to spend two nights at *Granada* in order to have a full day free to see everything. If you want to do any of these, do please let me know, so that I can offer you useful advice.

Murcians, like other Spaniards, are extraordinarily outgoing, effusive and noisy, especially in Summer. They are fundamentally egalitarian and democratic in outlook, and although most are Roman Catholic, they wear their Catholicism lightly and see its processions, baptisms, first communions and weddings as occasions for exuberant enjoyment and festivity, rather than solemnity. Even during solemn religious processions each penitent give out hundreds of sweets to eager children.

Both the Spanish parliament, the Murcian regional parliament, and the city halls of *Murcia* and *Cartagena*, are all controlled by the conservative *Popular Party*, but it does not have an absolute majority. He inherited an economic disaster from the socialist government that he ousted and the Spanish economy went into recession. Spain belongs to the eurozone but it has inherited massive debts and the government had had to pay high interest to its bond-holders because the European Central Bank is loth to buy government bonds of European Union eurozone countries (the German government will not let it do so). Happily, at the end of 2015 Spain began to emerge from economic recession, but because there is still and a frighteningly high rate of unemployment the outlook is far from rosy.

## PASSPORTS, VISAS AND RECONFIRMING YOUR TICKETS

**CHECK THAT YOUR PASSPORT HAS NOT EXPIRED! IF IT HAS, GET IT RENEWED!** People who are not citizens of a European Union Member State usually need *valid passports*, and may need *visa stamps* in them for visiting Spain and other European Union countries unless their country has reciprocal agreements for visitors to and from the European Union - thus I understand that visas are *NOT* required for US or Canadian visitors because such agreements exist, although citizens of many British Commonwealth nations do still need visas for entering Spain and all other EU countries. If in any doubt, travel agents or the nearest Spanish Consulate-General will advise whether or not a visa is required. Visas are issued at Spanish Consulate-General offices and there is always one attached to the Spanish Embassy in national capitals, and many large cities have one also (listed in the phone book).

United Kingdom and Irish citizens, even though they do not need visa stamps, should still carry their passport with them because these two Member States of the EU neither automatically assign each citizen with an ID card nor have they joined the "Schengen Group" of those EU nations which have abolished border control of travellers between the countries of this group. I believe that EU citizens from "Schengen Group" states need only carry their national ID card to enter Spain which belongs to the "Schengen Group".

Reconfirmation of your return flight is *not usually necessary* nowadays (whatever your travel agent tells you to the contrary), because international return flights on major airlines - and even charter flights - are *almost always reconfirmed automatically by the airline, without you having to contact them again at all*. Many tickets carry the rather confusing advice that reconfirmation should be 72 hours before departure, though you may well be able, in fact, to reconfirm a month before departure (especially on intercontinental flights) and so feel secure that you have got a seat reserved for you. You can often even reconfirm your return flight before you set out on your travels at all, at the desk of the airline in the airport from which you leave home; I myself often do this nowadays.

Some travellers still like to make sure later on. So if you are one of them ***IT IS YOUR RESPONSIBILITY AND YOURS ALONE*** to reconfirm your ticketing – not mine nor that of my staff. You can do it ***MOST EASILY*** like this. If you arrive in Madrid by plane from outside Europe you can reconfirm your international return flight at ***ANY*** airline desk (including that of Iberia Airlines) in ***Madrid-Barajas International Airport BEFORE*** you leave the international section of the airport -- regardless of whether you are going to spend a few days in the city or are simply going straight to the national section of the airport to catch a connecting national ***Iberia Airlines*** flights down to ***Murcia Airport***. The airport at present is at San Javier (***Murcia-San Javier Airport***), about 5 kilometres from Cabezo Gordo and our campaign base at the village of Dolores de Pacheco. However, a new Murcia Airport has been built at Corvera which is about 25 kilometres from Dolores de Pacheco, but it is still not yet open to air traffic, though if it manages to open in 2017 (which is unlikely), replacing the present San Javier airport, you will be met by us there of course.

The reason ***WHY*** you should do that ***straight away*** in ***MADRID*** is that once you get to ***Murcia-San Javier Airport*** you will find that it is possible to reconfirm ***ONLY Iberia Airlines*** international outward flights from Madrid or Barcelona, ***BUT NOT THOSE OF OTHER INTERNATIONAL CARRIERS*** because the ***Iberia Airlines*** desk at ***Murcia-San Javier*** is ***NOT*** connected by computer-link to any company except ***Iberia Airlines***. You can, however, reconfirm local return flights (*i.e.* flights within Spain) out of ***Murcia-San Javier Airport*** at the ***Iberia Airlines*** desk; so if you are addicted to reconfirming your flights you should reconfirm your return flight back to Madrid on ***Iberia Airlines*** on your arrival at ***Murcia-San Javier*** also. If you are coming from ***London*** by ***British Airways***, ***Ryanair***, ***Easyjet*** or other companies, then see to it that ***YOU*** find the receptionist of the flight in question on your arrival in order to reconfirm your return flight with him or her, if you are addicted to reconfirming return flights. ***British Airways*** has joined up in a single company with ***Iberia***; this may affect flight designations in 2017: you should find out.

Again, all this is ***YOUR responsibility***, not mine nor that of my senior site helpers. People are often forgetting to do this on arrival, and then continually pestering us to organize telephone calls for them from ***Caravaca*** or ***Dolores de Pacheco*** to international carriers in Madrid. I and my senior site helpers are busy enough, as it is, running a research project; we are ***NOT*** tour-operators nor a travel agency for wayward or forgetful new helpers, let alone for those who are merely neurotic obsessives.

## ***IMPORTANT MONEY MATTERS***

The Spanish currency is the euro €, which is divided into one hundred cents of a euro. At the time of writing, one euro, 1€, is roughly equal to \$1.19 US or £0.88 UK. Looked at the other way round, very roughly speaking \$1 US buys 0.83€ and £1 UK buys 1.13€. However, currency rates can fluctuate at times of international economic crisis. I recommend most definitely that you bring some banknotes in euros with you - ***say €100 euros at least***.

In Spain you can both get cash or pay for things with ***VISA*** or ***MASTERCARD*** credit cards. Please note, however, that ***AMEX*** cards and ***DINERS CLUB*** cards are often refused (because most retailers or hoteliers won't accept the stiff terms imposed by those two credit-card companies), and, furthermore, my experience of volunteers' difficulties has shown me that bank cash cards (*e.g.* ***ATT***) from your home banks (especially from US banks) ***tend not to work in Spain*** when you try to use them in automatic ATM cash machines here (whatever you may have been told to the contrary back home!) so don't rely on your bank cash card. Therefore you should also bring a ***VISA*** or ***MASTERCARD***, and most particularly you must make sure that it has been ***configured by your home bank for European Union countries***, and most especially for ***Spain***. Don't be slack about insisting on this because I've even had trouble getting my Spanish-issued ***VISA*** card to work in France and my son had trouble with his in the UK! (Yeah, I know you've got to pay interest charges with ***VISA*** and ***MASTERCARD***: That's how the cookie crumbles!).

Over the past four or five years we have found that local banks in the towns where we have our bases ***are refusing to cash traveller's cheques***. This is because they now have to enforce a very restrictive interpretation imposed on them by Spain's government of European Union regulations intended to prevent money-laundering. The Spanish authorities will now only allow banks in Spain to credit pre-existing customers' bank accounts with money paid in to them from non-account-holders' traveller checks -such as the US-dollar traveller checks of our helpers from other countries; the bank account holders here (us) would then have to pay those helpers back in euros from their (our) personal bank accounts, but the money paid into our accounts in that way is treated by Spanish tax authorities as part of our personal income on which we, the account holders, have to pay income tax to the Spanish government, ***so we now refuse to do that for you!*** ***THE BOTTOM LINE IS THAT YOU MUST NOT BRING TRAVELLER'S CHEQUES HERE***. So what to do? The only alternative is to bring as many euro banknotes with you as you think you will need here in the possible event of having problems when using your ***VISA*** or ***MASTERCARD*** in ATM machines. One way that seems to work quite safely is to get a cloth money-belt you can wear under your clothes and bring with you euro banknotes in denominations of 50 or 100 euros.

## ***RENDEZ-VOUS***

For field helpers arriving by plane for both ***Sima de las Palomas*** and ***Cueva Negra***, the rendez-vous is ***Murcia-San Javier Airport at San Javier (MJV)***.

Rendez-vous is on ***Fridays with set-downs and pick-ups mainly between 15.00 hours (3 p.m.) and 22.00 (10 p.m.):***

***Cueva Negra:*** pick up Friiday ***June 29<sup>th</sup>***, set down Friday ***July 20<sup>th</sup> 2018***

***Sima de las Palomas:*** pick up Friday ***July 20<sup>th</sup>***, set down Friday ***August 10<sup>th</sup>, 2018***

Murcia-San Javier (MJV) Airport is a small airport and because it forms part of a complex with the Spanish Air Force Academy for training officer pilots its air space is closed to civil traffic between 8 a.m. and 3 p.m.. This means that international flights in and out take place in the late afternoon or evening, and it also means they land or leave at broadly similar times, give or take an hour, regardless of whether the Winter or the Summer schedule is in force. Internal civil flights between the airport and Madrid by ***Iberia Airlines*** (the Spanish national carrier, or one of its subsidiary companies such as ***AirNostrum***) are mainly in the afternoon or evening though there is one early morning flight to Madrid: none of these internal national flights run on Saturdays or Sundays, however, because they are aimed at internal

businessmen's weekday needs to do the return trip in one day, and not those of international visitors on weekends. Intercontinental travellers from the USA or elsewhere are advised to book an onward *Iberia Airlines* afternoon or evening flight from Madrid Barajas Airport to MJV, and an afternoon or evening one back to Madrid. Just to complicate things a bit more, a new Murcia Airport has been built but is not yet functioning. If it starts operating in July, and the old airport has been closed, then you will be met at the new one, so don't worry.

Because of the aspects outlined above, we find it most convenient to only pick up and set down travellers at MJV Airport at 3-weekly intervals in the afternoon and evening of only **one** particular weekday, which in 2018 is **Friday**. If you arrive earlier on the Friday, you will have to be prepared to wait several hours for us to appear. If you want to leave earlier in the day, you will have to be prepared to hire a taxi (at your own expense) to get you to MJV Airport - and you will also have to be prepared to do this if you choose to arrive or depart on any **other** dates than **June 29<sup>th</sup>, July 20<sup>th</sup> and August 10<sup>th</sup>, 2018**.

**Beware** of British Midland flights advertized as going to "Murcia", when in fact they fly in and out of *Alicante International Airport* and we do **NOT** pick up or set down travellers at *Alicante International Airport* **under any circumstances**, because its heavy volume of air traffic leads to long delays in many flights, especially non-scheduled cheap charter flights from the UK or other EU states, and I am simply not prepared to have my drivers hanging around the airport for hours waiting for late planes to land, let alone to have to keep our cooks up all night keeping dinner warm for my drivers and late arrivals they bring back with them.

On Fridays there are flights between London and Murcia-San Javier Airport (flying time is two-and-a-half-hours; there is a 1-hour time-zone difference between Spain and the UK). **PLEASE NOTE THAT THESE FLIGHTS MAY NOT RUN EVERY DAY OF THE WEEK.** Please consult your travel agent, or the time-table of the airline on the web, about possible up-dates for July and August 2018.

The direct flights between London and Murcia-San Javier (MJV) Airport by either *Ryanair* from London (Stansted) and London (Luton) or *Easyjet* from London (Gatwick) are suitable for our rendez-vous arrangements because they will mean you don't have to hang around for twelve hours (or even find somewhere to stay overnight!) while waiting for us to pick you up. *Easyjet* flies also flies between Bristol and Murcia-San Javier and between Newcastle and Murcia San-Javier. There are even flights from Edinburgh by *Jet2*. You will find the details on the web. Please check the web because some carriers may be eliminating some services in 2018, we have been told.

Remember that each 3-week period will begin on Day 1 (arrival day, Friday) with rendez-vous at Murcia-San Javier National Airport (we start and finish on Fridays because there are not only connecting *Iberia (Air Nostrum)* flights from Madrid and Barcelona on weekdays for intercontinental travellers arriving in Spain from the USA, Australia or elsewhere (there often are no connecting *Iberia (Air Nostrum)* flights on Saturdays and Sundays), but also numerous low budget flights from the UK and some other EU countries. The following low budget airlines fly in to Murcia-San Javier, or have flown recently (the economic crisis has led to a reduction in flights and companies flying to Murcia-San Javier): *Bmibaby* (from Birmingham), *Easy-Jet* (from London-Gatwick and Bristol), *Flybe* (from Birmingham, Exeter, Southampton, and Norwich), *Flyglobespan* (from Edinburgh), *Jet2.com* (from Edinburgh, Blackpool, Leeds-Bradford, and Newcastle), *Virgin Express* (from Brussels), *Ryanair* (Dublin, London-Stansted, London-Luton, Bremen, Glasgow-Prestwick, Liverpool, Nottingham-East Midlands).

**Only if you have told us in advance, AND WE HAVE REPLIED SAYING WE SHALL,** will our drivers pick up late arrivals after 22.00 hours on June 29th at Murcia Airport once the *Iberia/Air Nostrum* plane from Madrid has landed (the reason is because the drive to Caravaca takes 75 minutes and on the first evening of our first session we like all our helpers to have dinner together at our Caravaca base, and certainly no later than 23.00 hours). On the other hand, we can set you down from 15.00 hours onwards, whichever of the afternoon or evening direct flights to London or Madrid you choose. Provided that **beforehand** you have given us your **flight number**, then if your plane is delayed, and arrives late at Murcia, we will wait for you, so don't panic! But if you have **not** given us your flight number beforehand, and your plane arrives late, it is unlikely there will be anybody to meet you at the airport (unless, if you're very lucky, a driver may be waiting for someone else off the same late flight who **had** given us the necessary details beforehand). **IT IS ALSO IMPORTANT TO STRESS THAT WE NEED YOUR FLIGHT DETAILS BEFORE JUNE FIRST 2018, EVEN IF YOU ARE NOT COMING UNTIL JULY 20<sup>th</sup>, BECAUSE AFTER JUNE 29<sup>th</sup> WE DO NOT HAVE REGULAR OR RELIABLE INTERNET ACCESS WHEN WE ARE IN THE FIELD AT CUEVA NEGRA AT CARAVACA BECAUSE THE CAVE IS IN THE COUNTRYSIDE WHERE THERE IS NO INTERNET COVER AND ONLY VERY POOR AND INTERMITTENT CELL PHONE COVER, AND THEREFORE WE MAY WELL FAIL TO RECEIVE EMAIL MESSAGES OR TELEPHONE CALLS SENT BY YOU BETWEEN JUNE 29<sup>th</sup> AND JULY 20<sup>th</sup>: SO NO LATER THAN JUNE 1<sup>st</sup> WE NEED ALL YOUR FLIGHT DETAILS UPTO AUGUST 10<sup>th</sup> IF YOU WANT US TO PICK YOU UP BY US AT MURCIA AIRPORT.** Transport between Murcia Airport and our accomodation bases is free of charge to helpers who arrive for the Friday afternoon-evening rendez-vous WHO HAVE GIVEN US THEIR FLIGHT DETAILS **BEFORE JUNE FIRST 2018**. If you are flying back to Madrid, avoid the early morning flight because we cannot ferry you to Murcia Airport to catch it and you will therefore have to hire a taxi at your own expense.

There are several operators of low-cost flights from the UK to Murcia-San Javier. You should check for up-dating of services on the web or through your travel agent, although we also shall try to keepourselves informed so as to be able to offer advice. Summer flight schedules are usually available by the beginning of April. Train and coach times are usually much the same, though there may be additional services scheduled during the busy Summer holiday months.

Here were *Ryanair* flight times advertized from/to London-Stansted or London-Luton and Murcia advertized for Fridays in 2016 which may be roughly similar in 2018

Airport	Dates, Times	Date, Times
	June 29 <sup>th</sup> , July 20 <sup>th</sup> Aug 10 <sup>th</sup>	Aug 10 <sup>th</sup>
Dep. London-Stansted	17.10 h	
Arr. Murcia-San Javier	20.55 h	
Dep. London-Luton	17.40 h	
Arr. Murcia-San Javier	21.25 h	

Dep. Murcia-San Javier	21.20 h	17.25 h
Arr. London-Stansted	23.05 h	19.10 h
Dep. Murcia-San Javier	21.50 h	
Arr. London-Luton	22.35 h	

Here were **Easyjet** flights advertized from/to London-Gatwick and Murcia on Fridays in 2016, which may be similar in 2017:

Airport	Dates, Times	Dates, Times	Date, Times
	June 29 <sup>th</sup> , July 20 <sup>th</sup> , Aug 10 <sup>th</sup>	June 29 <sup>th</sup> , July 20 <sup>th</sup> , Aug 01 <sup>th</sup>	July 20 <sup>th</sup> only
Dep. London-Gatwick	12.50 h		16.25 h
Arr. Murcia-San Javier	16.25 h		19.30 h
Dep. Murcia-San Javier	17.00 h	20.05 h	
Arr. London-Gatwick	18.35 h	21.40 h	

**British travellers** may like to know that there in recent years there have been also some *British Airways* flights to Madrid from Birmingham and Manchester and to Alicante from London-Gatwick, and that there were also some flights from these airports to Frankfurt where connecting flights onward to Murcia-San Javier Airport can be taken. I do not know what is available in 2018.

**Intercontinental travellers**, please note that if you are flying back from Murcia to London in the afternoon –especially if flying on budget airlines such as *Ryanair* or *Easyjet*, and then on to another destination from London, *you ought to arrange to spend the night in London* because flights from Spain to London are *very, very often delayed* in Summer when air traffic between northern Europe and the Mediterranean holiday coast is always *very heavy indeed* and because scheduled flights are given priority for take-off or landing budget airline flights can easily be delayed by a few hours without warning. You must take into account the likelihood of this occurring so as *not to miss your onward connecting flight* (e.g. to the USA or wherever). It could be very imprudent indeed to think you can arrive at London Gatwick at, say, 19.00 h and be in time to catch a 22.00 h plane from that same airport to the USA - and if you have to change airports and get to Heathrow, allow a good six hours, as you may have to collect your luggage at Gatwick before getting the coach from Gatwick to Heathrow (which takes at least an hour - more if traffic is heavy) and once there you'll have to check it in again before your next flight is closed.

**Iberia Airlines** Please bear in mind that, at Spanish airports, flights are *closed one hour before scheduled take off*. This means that if you are going to change planes in Madrid, even between national flights, let alone for international and intercontinental flights, then when you arrange your flights you must make sure that you allow around *two hours* between your plane's scheduled landing (it might be delayed) and the take-off of your next plane. If you're coming from the USA, it is probably quickest and cheapest to change from a US carrier to *Iberia (Air Nostrum)* at Madrid (*Air Nostrum* is simply a subsidiary company belonging to *Iberia Airlines* and many internal flights in Spain are serviced by this subsidiary), as your US carrier may well include the price of one onward flight within Europe in the cost of your ticket to Madrid.

**Alicante**: Please note that even though there are *British Airways* flights between London-Gatwick and *Alicante International Airports*, **we refuse absolutely to pick up or set down travellers at Alicante Airport, under any circumstances whatsoever**. We refuse to do this because *Alicante International Airport* is both too far from our centres of activity and its air-traffic density is so very great that the frequent long delays in arrival and departure times there could mean that our staff assistants who drive the vehicles might be inconveniently away for unpredictably long periods. Also, there are so many hundreds of flying holidaymakers there at all times of the day and night during the summer, that you could easily miss us and we could easily miss you, whereas *Murcia-San Javier Airport* is very small and quiet, and we've never missed meeting anyone there yet! We appreciate this might disappoint some international travellers, but the smooth running of our project must take precedence over individual convenience of travellers.

If you decide, however, to travel to Alicante Airport, on arrival there do **NOT** try to make your way to our pick-up rendez-vous at Murcia-San Javier Aiport. Instead you **MUST MAKE YOUR OWN WAY** to our **bases at Caravaca or Dolores de Pacheco**, respectively. **You will have to go first to Murcia**. A regular coach service leaves every two hours from Alicante Airport for Murcia city bus station (taking 55 minutes), from 07.15 h to 21.15 h, and the return service leaves Murcia every two hours from 07.00 h to 21.00 h.

**About the buses to Caravaca, to San Javier, and to Los Alcázares** from the Estación de Autobuses (Murcia city bus station) (AND SEE BELOW FOR MORE DETAILS, UNDER TRAVEL OPTIONS BY RAIL OR COACH)

On arrival at Murcia city buststaion, you must find the counter for the service you need (i.e. Caravaca for Cueva Negra; or San Javier or Los Alcázares for Sima de las Palomas), and buy your ticket, which you then show to the bus driver when you board.

On working week-days, buses leave for Caravaca at ten minutes past the hour, every hour from 06.10 h through to 21.10 h (there are fewer buses on public holidays and weekends) and the journey takes roughly an hour-and-a-half. Return buses leave Caravaca for Murcia at ten minutes past the hour, every hour from 06.10 h through to 21.10 h (except that instead of 15.10 h it leaves at 15.30 h).

On working week-days, buses leave for San Javier on the hour every hour from 07.00 h to 21.00 h (there are fewer buses on public holidays and weekends) and take three-quarters of an hour; the return trip leaves at half-past each hour.

On working week-days, buses leave for Los Alcázares at half-past the hour every hour from 08.30 h to 20.30 h and you should get off at the first stop where the road on which you are traveling from Torre Pacheco enters the town of Los Alcázares (there are fewer buses on public holidays and weekends) and the journey takes roughly an hour; return journeys run from 07.20 h to 19.20 h once an hour but with varying departure times (consult us).

**Alicante, again:** If you do decide to travel through *Alicante International Airport*, then on your head be it! You, and you alone, are responsible for getting from there to our field bases. You must go to them *directly*, without going to Murcia-San Javier Airport, (1) because it will be cheaper and much less time-consuming for you, especially if you are going to Caravaca to help at Cueva Negra, and (2) because if your flight were to be delayed and you were to arrive after our rendez-vous pick-up had left Murcia-San Javier Airport, you would find yourself absolutely stranded, at an airport in the middle of nowhere, if you had to get to Caravaca on a Friday night! - and there

would be no way we could help you as we would be a long way away by that time. You would have been better off heading for Murcia city bus station from Alicante in the first place, because even if you were to have missed the last bus up to Caravaca from Murcia, you would nevertheless be in a city with lots of hotels where you could easily find a bed for the night before getting a bus up to Caravaca next morning (Friday).

**Low-budget travellers from the British Isles** might also be interested in low budget flights to **Madrid, Valencia, or Barcelona**, that fly out of other British and European cities. Coaches are much cheaper than trains in Spain and there are many overnight coaches from Madrid or Barcelona which save you the cost of a bed (whereas overnight trains nowadays have disappeared in Spain).

**IT IS MOST IMPORTANT TO REMEMBER THE MURCIA-SAN JAVIER AIRPORT IS BY THE SEA AND THE MURCIAN COAST IS A MAJOR HOLIDAY RESORT AREA, SO HIGH-SEASON FLIGHTS IN THE JULY-AUGUST HOLIDAY PERIOD GET FULLY BOOKED UP SEVERAL WEEKS AHEAD. SO IF YOU ARE COMING YOU SHOULD FINALIZE YOUR TRAVEL ARRANGEMENTS, BY THE END OF APRIL IF YOU WANT TO BE SURE OF GETTING A SEAT THROUGH TO MURCIA-SAN JAVIER. REMEMBER THAT ON-LINE BOOKING WITH COMPANIES LIKE RYANAIR OR EASYJET OFTEN GIVES YOU A VERY CHEAP DEAL IF YOU BOOK A FEW MONTHS BEFOREHAND.**

**IF YOU ARE MAKING ALTERNATIVE TRAVEL ARRANGEMENTS AND WANT US TO TRY TO MEET YOU AT ANY OTHER TIME OR PLACE, IT IS ESSENTIAL THAT BY JUNE 1<sup>st</sup> YOU HAVE INFORMED ME IN WRITING. YOU MUST INFORM ME DIRECTLY BEFORE JUNE 1<sup>st</sup> 2018 BY EMAIL to [mjwalke@gmail.com](mailto:mjwalke@gmail.com)**

Please note that if we meet you at any place, date, or time of day other than the official rendez-vous place, dates, and times you will be expected to pay for our petrol even if we have agreed to come to meet you or set you down, but **whether or not we agree to do so will depend on whether it is convenient for us**, because a major field project has many commitments which tie up our vehicles and staff.

Unless you have received a reply from me personally, that we shall meet you, you **MUST** find your own way to the accommodation base at your own expense. For *Cueva Negra*, our base is the residential Ascruz state-run school (*Colegio Ascruz*) on the edge of the town of Caravaca de la Cruz, and for *Sima de las Palomas* it is the state school at Dolores de Pacheco where we can be contacted via the village Civic Centre where we take our meals at its restaurant.

If you get into difficulties when travelling to us, and cannot arrive at an agreed time or place, try phoning us, so that we aren't hanging around unnecessarily, and can try to help you with an alternative rendez-vous. You can try my cell phone number 620-267104 (34-620-267104 from outside Spain) though when I am in the field this number is very likely to be out of cover (especially at *Cueva Negra*) and you would need to ensure before leaving your country of origin that your own mobile phone is set up so as to be able to dial cheaply within Spain and not via a hideously expensive international phone call that re-routes your call first through your country of origin and back again to Spain!!! If dialling from a public phone box, we recommend you put a one euro (1€) coin into the phone and dial either 968-700844 (the Ascruz school at Caravaca, after 15.00 hours Central European Time (CET) when we have got back from the field; 34-968-700844 from outside Spain ) or 968-173200 or 685-111111 (Dolores de Pacheco Civic Centre, after 15.00 hours Central European Time (CET) when we have got back from the field; 34-968-173200 or 34-685-111111 from outside Spain), depending on which field base you need to get to. Check on the time zone before you phone; 14.00 hours UK time is equivalent to 15.00 hours CET, but if you're phoning from the USA there are several hours of difference!

If you arrive at any place, date, or time of day, other than the rendez-vous place, dates, and times, as specified above, you may well have to make your own way to our base at your own expense. Whether or not we might be able to agree to meet you somewhere to get you to our base will depend on whether it is convenient for us, because a major field project has many commitments which tie up our vehicles and staff. Even if you have contacted us and we have agreed to help you out, you will be expected to pay for our petrol even if we have agreed to come to meet you or set you down.

**Unless you have received a reply from me personally, that we shall meet you, you **MUST** find your way to the accommodation base at your own expense. In that regard, the following information may be helpful.**

**Cueva Negra:** From Murcia Airport to our accommodation base at Caravaca's "Colegio Público "Ascruz" de Educación Especial" (Residential Public School "Ascruz" for Disabled Children), the distance of 120 kilometres means your taxi fare will cost you at least €80 euros a head and maybe a good bit more. It could therefore be very expensive for you if you fly in on a day or at a time other than the scheduled rendez-vous ones.

**Sima de las Palomas:** From Murcia-San Javier Airport to our accommodation is at the village school at Dolores de Pacheco but we eat three times a day at its village "Centro Cívico" (Civic Centre) which is only about 8 kilometres by road from the Airport, and so if you are flying in on a day or at a time other than the scheduled rendez-vous ones, we can probably pick you up at the Airport, provided we have advance information; if we do not, a taxi to our accommodation base from the Airport should cost about €10 euros.

## **TRAVEL OPTIONS BY RAIL OR COACH**

If you plan to arrive by rail or coach on a rendez-vous Friday afternoon, do **NOT** head for Murcia-San Javier Airport **without first consulting me, Michael Walker, directly**, because it will probably be **SIMPLER** for us (and you) to arrange to meet you that day - elsewhere, and at another time- especially if you are coming to *Cueva Negra*: e.g. at *Calasparra* railway station if you're coming by train, or where the coaches from Murcia stop in *Caravaca* itself if you're coming by coach. Under **NO** circumstances will we meet passengers off trains at Murcia city railway station, because there is always such a throng of travellers there that you could easily miss us or we could easily miss you. The distance between *Caravaca* and *Murcia-San Javier Airport*, together with our shortage of cars and drivers, means that unfortunately there is very little room indeed for flexibility in our arrangements to meet people coming to *Cueva Negra* other than at the official Friday rendezvous time and place. We can be more flexible with regard to people coming to *Sima de las Palomas* because our base at *Dolores de Pacheco* is quite near to both the *Murcia-San Javier Airport* and the *Balsicas-San Javier* railway station.

**Cueva Negra:** If you plan on coming to Caravaca by rail from Madrid, take the Madrid-Murcia-Cartagena train to the station of Calasparra. If you have not been informed by me that you will be met by us at *Calasparra* station, then you *must* find a taxi to our accomodation base at Caravaca (20 kilometres away) at your own expense. You need to look very carefully at the train time-table (see below) for trains plying the Madrid-Albacete-Murcia-Cartagena line, because no more than *TWO* of the 4 or 5 daily trains each way, stop at *Calasparra* station and so you must make sure you take one that does.

If you want to come to Caravaca by train from Barcelona, you will have to take a train to Murcia from Barcelona on the Wednesday, spend that night in an hotel at Murcia, and catch an early bus up to Caravaca from Murcia city bus station on the Friday morning (they leave hourly at ten-past the hour and take 90 minutes); it would be simpler and cheaper for you to take an overnight long-distance coach from Barcelona to Murcia city bus station. Your return to Barcelona from Murcia by train from Caravaca would mean catching probably a through train which leaves at about 13.30 h from Murcia railway station, after getting to Murcia city bus station by bus from Caravaca during the morning, or you could simply change to a long-distance coach at the bus station in the city. The railway station and bus station in Murcia are at opposite ends of the city, and a long hot walk with luggage in the July sun!

One small snag, if you insist on prebooking your tickets from outside Spain, is that travel agents (especially in the U.S.A.) may well tell you that they can only sell you tickets between Murcia and *Calasparra* at the full cost of the Murcia-Albacete part of the Cartagena-Murcia-Albacete-Madrid line: this would be very expensive for you and you'd be better off buying your ticket at Murcia station for the Murcia-*Calasparra* leg of your journey.

A better way is to book your tickets yourself *on-line* over the web from the Spanish national railway company *RENFE*, and you can get information in different languages about how to do it at <glinfo@renfe.es> ("gl" here stands for "grandes líneas" or "great lines", i.e. "main lines"; do not read it as "g1" because it is GL not G1 !) It is best to book on-line to be sure of a seat. You are not allowed to stand as a passenger. The economy class single fare between Madrid and Murcia varies from between 30€ and 47€, depending onto just which train you book; the ticket to Balsicas-Mar Menor is about 3-5€ more, whereas the ticket to Calsaparra is about 3-5€ less. (The preferential class single-fare prices are about 55-65€ to Murcia.)

Prices of tickets are slightly less if you buy *on-line* than if you buy at a railway station; furthermore, if you buy a *return ticket* at one go you may be able to get a further discount (perhaps upto 20%). There also may be student reductions provided you have appropriate accreditation documents; don't forget about the possibility of an *Inter-Rail* pass if you want to do further student travelling in Europe.

On the Barcelona-Cartagena railway line, the economy class single fare between Barcelona and Balsicas-Mar Menor (via Murcia, or changing at Murcia) is about 30€ euros (the preferential class fare is about 50€; though you may have to pay twice that if you take a high-speed "*Euromed*" train from Barcelona to Alicante and change there, or if you take a high-speed "*AVE*" from Barcelona to Madrid and then a train down to Murcia and Balsicas-Mar Menor; I have not given those options in the time-table. As yet there are no high-speed trains between Madrid and Murcia but the line is under construction and may be open in a couple of years time.)

If you are booking from outside Spain and you are coming to Balsicas-Mar Menor you may find that you are required to book all the way through to Cartagena even though you get off the train at Balsicas which is half-way between Murcia and Cartagena (the extra cost will be trivial), and if you are coming to Calasparra you may find you have to book all the way through to Murcia even though you are getting off the train at Calasparra half-an-hour before the train reaches Murcia.

If you are coming by train from Madrid to spend some days at *Cueva Negra* followed by some days at *Sima de las Palomas*, then you could book a return ticket to Balsicas-Mar Menor railway station, from which you will be returning to Madrid, but get off at *Calasparra* railway station when you come to join us. *Calasparra* is nearer to Madrid, but you will find it is cheaper to book a return ticket to Balsicas-Mar Menor than to book two single tickets. *UNDER NO CIRCUMSTANCES* will we meet passengers at Murcia city railway station (Murcia "*El Carmen*"), as there is always such a throng of travellers there that you could easily miss us or we could easily miss you. If you are coming by train from Barcelona to dig at both *Cueva Negra* and *Sima de las Palomas* afterwards, you could book a return to Balsicas-Mar Menor-San Javier but get off at Murcia to change for *Calasparra*.

**Cueva Negra:** If you plan on coming to Caravaca by coach you will need to get a coach to Murcia city bus station and then change to the local coach out to Caravaca. From both Madrid and Barcelona there are several daily coaches to Murcia city bus-station; however, if you take a daytime coach - particularly from Barcelona, which is a long journey down to Murcia, or those which leave Madrid in the late afternoon rather than a morning coach - then you will arrive too late in the evening to catch the last *Murcia-Caravaca* coach, and will have to find an hotel for the night in Murcia city. To avoid that expense, you can catch *overnight* coaches to Murcia city on Wednesday from both Madrid and Barcelona, and then an early Friday morning bus from Murcia out to Caravaca. From the Caravaca bus station it is about a kilometre and a half to our accomodation base at the "*Colegio Público "Ascruz" de Educación Especial*" (Residential Public School "*Ascruz*" for Disabled Children). If you want us to pick you up at the Caravaca coach-stop, phone us at the school (dial 968-700844) when you arrive, and, if we are there, we will do so (between 07.30 and 14.30 hours we are *NOT* there, because we are all at *Cueva Negra* excavating). Otherwise you can either take a taxi to the school, or walk if your luggage is a backpack. If walking, ask, first, how to get to the large "*Templete*" monumental fountain (a neo-Classical structure of columns and a cupola). It is beside a set of traffic-lights where you take the right-hand fork, which is the road signposted to Moratalla. Walk up the road for about 300 metres until you see a sign on the left to "*Fuentes del Marqués*" and Colegio Ascruz which, after walking about 800 metres along a country lane, is a large concrete modern building up on a low bluff on your right). There is a short-cut if you're daring enough: once you've left the *Templete* behind you, and have gone about a hundred metres along the road to Moratalla, at the next set of traffic-lights you come to (beside a bar called "*Zaián*"), you can take the left-hand street, and, after about another 200 metres, where the street suddenly bends to the left, you, instead, go straight ahead along a pedestrian walk which passes some houses on your right and then becomes a very wide country footpath between a shady avenue of trees, which you follow for about 600 metres, until you reach a tarmac lane where you turn right and then take the first left up to the school.

**Sima de las Palomas:** If you plan on coming from Madrid or Barcelona by rail to *Dolores de Pacheco*, you must catch the Madrid-Albacete-Murcia-Cartagena or Barcelona-Murcia-Cartagena trains to the station of Balsicas-San Javier which is a compulsory stop for *ALL* trains. In fact one of the Barcelona trains that stops at Balsicas-San Javier starts at the large southern French city of Montpellier. If

you have given us advance notice of your time of arrival, we can probably meet you; if not, you must find a taxi - the distance is about 15 kilometres and may cost you about 15€ euros. **BUT IT IS NOT CERTAIN THE TRAINS FROM BARCELONA TO MURCIA AND /OR CARTAGENA WILL STILL BE RUNNING IN JULY 2018 (SEE BELOW).**

If you plan on coming from Madrid or Barcelona by coach to *Dolores de Pacheco*, you have several options. From both cities there are long-distance coaches to Murcia city bus station. If you take overnight coaches to Murcia city from Madrid or Barcelona on Mondays you can easily get buses that leave in the early hours of Fridays from the Murcia city bus station which will take you Los Alcázares which is about 6 kilometres from *Dolores de Pacheco*, and, provided we have advance information about the place and time of your arrival, we may well be able to pick you up from Los Alcázares. You can always try phoning us at the *Dolores de Pacheco "Centro Cívico"* (dial 968-173020), but remember we are not there between 07.30 and 14.30 as we are at *Sima de las Palomas* excavating. In any case, a taxi should only cost you about 12€ euros from where you leave the coach.

The table below shows the approximate times of trains that were advertized last year on the Madrid-Albacete-Murcia-Cartagena railway line on **Fridays** (the summer time-table for 2018 is not yet available), which does not involve your changing trains anywhere - except for the *first* train in the table. However, some of the trains shown may be taken off, according to rumours, owing to severe economic problems in Spain. Times have been rounded to the nearest 5 minutes (trains are not very punctual). Take very good note that only **two** of them each way stop at Calasparra, whereas they **all** stop at Balsicas-Mar Menor. You should check them first over the web by going to *Renfe* on the web or sending an email to <glinfo@renfe.es>, or at the railway station, or else with a travel agent (note: the times may be different on *other* days of the week, especially at weekends and on public holidays).

**YOU MUST NOT GET OFF, OR GET ON, ANY TRAIN AT MURCIA CITY "EL CARMEN" RAILWAY STATION, BECAUSE WE DO NOT PICK UP OR SET DOWN THERE; THE BIG CITY STATION IS SO BUSY THAT WE CAN ALL TOO EASILY FAIL TO MEET UP WITH ANY PASSENGERS WHO GET OFF THERE.** However, if booking on-line you may nevertheless have to make your bookings to/from Murcia city (Cueva Negra session), or Cartagena (Sima de las Palomas session), if the on-line booking system does not let you book on-line to/from Calasparra (Cueva Negra session), or Balsicas-Mar Menor (Sima de las Palomas session), but all the same you **must** get on/off your train only at Calasparra/Balsicas-Mar Menor railway stations; if you oversleep on the train and get carried downline to Murcia or Cartagena, you will have to make your own way to our bases, probably by hiring a very expensive taxi (you wouldn't be the first to have done that)!!!!

<b>dep. Madrid-Chamartín</b>	<b>dep. Madrid-Atocha</b>	<b>arr. Calasparra</b>	<b>arr. Murcia</b>	<b>arr. Balsicas-Mar Menor</b>
07.10 h	07.25 h	10.50 h	11.44 h ends here, but you can then change to a Murcia-Cartagena train: dep. Murcia 11.50 h	12.20 h
*09.00 h*	*09.15 h*	*does not stop here*	*13.25 h*	13.55 h
*12.35 h*	*12.50 h*	*does not stop here*	*16.45 h*	17.10 h
*16.30 h*	*16.45 h*	*does not stop here*	*20.50 h*	21.15 h
19.00 h	19.20 h	22.30 h	23.20 h	23.55 h
<b>dep. Balsicas-Mar Menor</b>	<b>arr. Murcia</b>	<b>arr. Calasparra</b>	<b>arr. Madrid-Atocha</b>	<b>arr. Madrid-Chamartín</b>
09.05 h	09.35 h	10.25 h	14.00	14.15 h
12.30 h	13.00 h	does not stop here	17.10 h	17.20 h
16.15 h	16.45 h	does not stop here	20.45 h	21.00 h
16.55 h	17.25 h	does not stop here	22.20 h	22.35 h
18.35 h	19.05 h	19.55 h	23.15 h	23.40 h

\* \* If you are coming to *Cueva Negra* and take any of these three trains, then, because we do **not** pick up arrivals at Murcia city railway station, once you get to Murcia city railway station you should take a taxi to Murcia city bus station (*Estación de Autobuses*) and from there take the bus from Murcia to Caravaca. BUT OVER THE YEARS WE HAVE NOTICED THAT SPANISH RAILWAYS HAVE HAD A BAD HABIT OF MAKING CHANGES IN THE TIME-TABLES, AND PARTICULARLY REGARDING JUST WHICH OF THE DAILY TRAINS MAY STOP AT **CALASPARRA**, SO THE ABOVE ARRANGEMENTS WHICH HAVE BEEN ANNOUNCED MIGHT BE CHANGED EVEN YET AGAIN IN SUMMER 2017 – SO CHECK ON-LINE OR WITH YOUR TRAVEL AGENT!

*Madrid-Chamartín* railway station is the Madrid terminus on the northeastern edge of the city, but all trains also stop at *Madrid-Atocha* railway station which is in the heart of Madrid and may be more convenient from some hotels. Return tickets are 20% cheaper than buying a single ticket each way. If you're coming to both *Cueva Negra* and *Sima de las Palomas*, then buy a return ticket to Balsicas but get off at Calasparra, as it will be cheaper for you than buying two single tickets.

Below were the advertized times of trains on the Barcelona(*Sants*)-Valencia-Alicante-Murcia-Cartagena railway line last year on **Fridays** in 2016 showing the stations of interest to us, but you should check on-line or at the station or with a travel agent (note: they may be different on *other* days of the week or during the Summer, especially weekends and public holidays). Times are shown for the *Sants* station at Barcelona. The train times may be similar in summer 2018.

This train takes you directly from Barcelona to Balsicas-Mar Menor and back with no change of trains:

<b>dep. Barcelona-Sants</b>	<b>(arr. Murcia)</b>	<b>arr. Balsicas-Mar Menor</b>
15.00 h	(21.45 h)	22.25 h
<b>dep. Balsicas-Mar Menor</b>	<b>(arr. Murcia)</b>	<b>arr. Barcelona-Sants</b>
13.10 h	(13.45 h)	20.40 h

The following involve **changing trains** at Murcia:

<b>dep. Barcelona-Sants</b>	<b>arr. Murcia</b>	<b>dep. Murcia</b>	<b>arr. Balsicas-Mar Menor</b>
12.00 h	18.50 h	22.00 h	22.25 h
17.00 h	23.45 h	23.50 h	00.05 h

<b>dep. Balsicas-Mar Menor</b>	<b>arr. Murcia</b>	<b>dep. Murcia</b>	<b>arr. Barcelona-Sants</b>
05.40 h	06.05 h	06.30 h	13.40 h
08.00 h	08.35 h	09.30 h	16.35 h

Not shown here – because connections with Murcia are complicated - are the high speed (and very expensive) “Euromed” trains that ply between Barcelona and Alicante or “AVE” trains between Barcelona and Madrid taking only some three hours; for information about these consult a travel agent or go on-line to *Renfe*.

It is also possible to come by train from Montpellier in France via Barcelona to Murcia where you will have to change to get to Balsicas or Calasparra.

There are no direct coaches between Madrid and Caravaca. You have to travel via Murcia city bus station.

There are various companies of coach services but one of the biggest companies in Spain is “ALSA”. Here were advertized times last year of some “ALSA” coaches and buses on Fridays between Madrid and Murcia city bus station, and Barcelona and Murcia city bus station.. Times may be similar in 2017. Many “ALSA” coaches leave from Madrid’s “Estación del Sur” bus station (ES), though some leave from Barajas Airport Terminal 4 (BAT4) and return to it. A one-way ticket costs around 45€. Many “ALSA” coaches leave from Barcelona’s “Estació de Nord” (BN) and return from Murcia both to that bus station and also to Barcelona El Prat Airport Terminal 1 (PT1) though, oddly, none seem to leave from the airport for Murcia. The single fare from Madrid to Murcia is between 30 and 45€, and from Barcelona to Murcia around 50€.

<b>dep. Madrid BAT4</b>	<b>dep. Madrid ES</b>	<b>arr. Murcia</b>
	01.30 h	06.00 h
01.30 h		06.45 h
	07.30 h	12.05 h
07.30 h		12.25 h
	09.30 h	15.00 h
09.30 h		15.05 h
	14.00	19.35 h
14.00 h		19.55 h
	16.00 h	20.35 h
16.00 h		20.55 h
	17.45 h	22.35 h
	23.59 h	04.40 h (next morning)
23.59 h		05.05 h (next morning)

<b>dep. Murcia</b>	<b>arr. Madrid ES</b>	<b>arr. Madrid BAT4</b>
01.30 h	06.30 h	
01.30 h		06.45 h
07.30 h	12.05 h	
07.30 h		12.25 h
09.30 h	15.00 h	
10.30 h	16.30 h	
14.00 h	19.35 h	
14.00 h		19.55 h
16.00 h	20.35 h	
16.00 h		20.55 h
17.45 h	22.35 h	
23.59 h	04.40 h (next morning)	
23.59 h		05.05 (next morning)

There are direct coaches between Madrid and Los Alcázares where we can easily take you or meet you as it is only five kilometres from our Sima de las Palomas base at Dolores de Pacheco, though you can also change buses in Murcia if it is more convenient for you. Here are the direct coach timetables:

<b>dep. Madrid BAT4</b>	<b>dep. Madrid ES</b>	<b>arr. Los Alcázares</b>
08.45 h	09.30 h	16.15 h
	13.30 h	19.40 h

<b>dep. Los Alcázares</b>	<b>arr. Madrid ES</b>	<b>arr. Madrid BAT4</b>
08.20 h	15.00 h	15.55 h

“ALSA” coaches leave from Barcelona’s “Estació de Nord” bus station EN, though a few call at Barcelona “Sants” railway station BS.

<b>dep. Barcelona EN</b>	<b>arr. Murcia</b>
01.00 h	10.30 h
07.00 h	16.00 h
07.15 h	16.00 h
09.00 h	20.00 h
12.00 h	23.15 h
18.00 h	04.35 h (next morning)

18.20 h	04.35 h (next morning)
19.00 h	05.15 h (next morning)
22.0 h	06.30 h (next morning)

dep. Murcia	arr. Barcelona EN	arr. El Prat Terminal 1
00.30 h		09.05 h
00.30 h	09.30 h	
03.15 h	12.30 h	
07.15 h	18.15 h	
11.30 h	23.00 h	
15.15 h		00.00 h (midnight)
19.05 h	05.30 h (next morning)	
19.05 h		05.10 h (next morning)
22.20 h	08.40 h (next morning)	

Some of the coaches from Madrid or Barcelona go only as far as Murcia, whereas others stop at Murcia but then go on either to Cartagena and La Manga or to Los Alcázares or Torre Pacheco (especially those from Madrid), or to the Andalusian cities of Almería, Granada, Málaga, Seville and Algeciras (especially those from Barcelona). Helpers at Cueva Negra will have to get off at Murcia city bus station and change to the bus to Caravaca. Helpers at Sima de las Palomas can get off at Murcia city bus station and change to buses to either San Javier or Los Alcázares, but there are also some coaches that go on to one or other of those two towns and they are also shown, although arrival times are very rough-and-ready as they depend very much on traffic-density on crowded holiday-season roads (in some cases they get to San Javier or Los Alcázares by going not through Murcia but through Elche). The times will doubtless be subject to change and there will certainly be more coaches and more times scheduled during the busy holiday season of July and August. I've not been able to find out about arrival times at San Javier so far, I'm sorry to say.

From Murcia city bus station (*Estación de Autobuses*), Cueva Negra helpers can catch buses to Caravaca, where we can probably meet you at the bus stop provided we know on which bus you are arriving and provided it is after 14.30 h (before then we are excavating at Cueva Negra), which will save you a thirty-minute walk out to the "*Colegio Público "Ascruz" de Educación Especial*" (Residential Public School "Ascruz" for Disabled Children) which is our base and a bit hard to find until you've learnt to find your way around as it lies on the northwestern outskirts of the town: although there is a short cut, you won't get lost if you take the long way round, by asking first for the "*Templete*" monumental fountain and, once there, take the Moratalla road for about 300 metres until you see a sign on the left to "*Fuentes del Marqués*" and Colegio Ascruz which, after going about 800 metres along a country lane, is up on a low bluff on your right). Sima de las Palomas helpers can catch buses either to San Javier or Los Alcázares (each of which is about 6 kms from Dolores de Pacheco) where we may just be able to meet you though ***we would most certainly need advance notice of your time and place of arrival***, otherwise you'll have to find a ***taxis*** to the "*Centro Cívico de Dolores de Pacheco*" – the Civic Centre where we stay at Dolores de Pacheco, because there's no way in the world you're going to want to walk carrying your luggage for 6 kilometres in the searing heat of July and August (it's a lot hotter there than at Caravaca).

#### ***About the buses to Caravaca, to San Javier, and to Los Alcázares*** from the *Estación de Autobuses* (Murcia city bus station):

At Murcia city bus station, find the counter for the service you need (i.e. Caravaca for Cueva Negra; or San Javier or Los Alcázares for Sima de las Palomas), and buy your ticket, which you then show to the bus driver when you board.

On working week-days, private buses ("*Autobuses Costa Cálida, S.L.*") leave for **Caravaca** at ten minutes past the hour, every hour from 06.10 h through to 21.10 h (there are fewer buses on public holidays and weekends) and the journey takes roughly an hour-and-a-half. Return buses leave Caravaca for Murcia at ten minutes past the hour, every hour from 06.10 h through to 21.10 h (except that instead of 15.10 h it leaves at 15.30 h).

On working week-days, the public "*LATBUS*" (no. 70) buses leave for **San Javier** on the hour every hour from 07.00 h to 21.00 h (there are fewer buses on public holidays and weekends) and take three-quarters of an hour; the return trip leaves at half-past each hour. San Javier is *not* the end of the line of the no. 70 bus, as many of these buses go further on to San Pedro del Pinatar, Torre de la Horadada and some as far as Campoamor.

On working week-days, private buses ("*Giménez García y Hermanos, S.A., Autobuses*") leave for **Los Alcázares** at half-past the hour every hour from 08.30 h to 20.30 h and you should get off at the first stop where the road on which you are travelling from Torre Pacheco enters the town of Los Alcázares (there are fewer buses on public holidays and weekends) and the journey takes roughly an hour; return journeys run from 07.20 h to 19.20 h once an hour but with varying departure times (consult us). Some of these buses finally end at the beach resort of **Los Narejos** though there are some that go on to as far away as **La Unión**; *although these pass quite near to our base at Dolores de Pacheco only one bus each working week-day from Murcia to Los Alcázares and La Unión actually passes through our village and can drop you off there, which is the one that leaves Murcia at 20.30 h and reaches Dolores de Pacheco at 21.25 h; likewise the only bus back to Murcia from Dolores de Pacheco calls there at 07.30 h, reaching Murcia at 08.30 h; however, I have been told this service has now been suspended altogether.*

If you're a full-time student, bring an *International Student Card*; it may get you to discounts on trains and long-distance coaches. Young people can buy *Interail* travel passes for Europe but you will probably have to be prepared to pay supplements on most of the Spanish trains that you would want to use - even so, the overall discount may be worth having if you're thinking of visiting other countries whilst in Europe.

## **Seeing Granada and the Alhambra Palace**

From Murcia bus station there are several coaches every day to Granada which take roughly four or five hours each way. To see the breathtakingly beautiful Moorish architecture of the mediaeval Alhambra palace you need to stay overnight in Granada (I recommend the *Hotel Tilos* in the Plaza Birrambla in the heart of the old city) and get up at 6 o'clock to climb the hill to the palace and get a good place in the queue for tickets so that you can join the morning visits and don't end up only with an afternoon ticket that means going back down into the city and then having to trudge back again up the hill in the sizzling early afternoon heat - so you'll need to spend two nights there at least. You could get a coach on the Friday when your stay ends, see the Alhambra on the Saturday, get a coach up to Madrid on Sunday, and fly out of Madrid on the Monday. You could hire a drive-yourself-car which you could prebook to pick up on the Friday at *Murcia-San Javier Airport* and return, say, to *Madrid-Barajas Airport* on the Saturday, and you'll find *Hertz*, *Avis* or *Eurocar* will give you cheaper rates than those they give in Spain provided that you book it from outside Spain *BEFORE* you leave your own country (shift-stick gears are much cheaper to hire than automatics). Coaches for Granada leave Murcia city bus station at 08.30 (fast), 09.00 (slow), 11.30 (fast), 16.00 (both slow and fast coaches) and 22.00 hours (slow) - the 16.00 fast one is very convenient as it gets you there in a fast three-and-a-half hours so you arrive in good time to check in to your hotel and get a good night's sleep before waking early to go up to the Alhambra palace.

## **EARLY AND LATE ARRIVALS; STAYING ON IN SPAIN AFTERWARDS**

I am used to coping with both early arrivals and requests for assistance from helpers who want to visit Murcia, Cartagena, or other places in Spain, after excavating with us. In all of these cases (including late arrivals), it helps me to help you if I have received advance notice of your needs and wishes - preferably by May 1<sup>st</sup> and, in any case *NO LATER* than June 1<sup>st</sup> because once I am looking after you in the field I cease to be immediately contactable by phone, fax or e-mail.

Phone calls after June 29<sup>th</sup> from late arrivals should be made between 15.00 and 24.00 hours Central European Time, from June 29<sup>th</sup>-July 20<sup>th</sup> to 968-700844 (from within Spain) or 34-968-700844 (from countries outside Spain), and for July 20<sup>th</sup> to August 10<sup>th</sup> to 968-73020 or 685-111111 (from within Spain), or 34-968-173020 or 34-685-111111 (from countries outside Spain). You can also try my cell phone though I may well be out of range if I am at Cueva Negra: the number to ring is 620-267104 from inside Spain or 34-620-267104 if you are outside Spain.

Don't despair! In worst case scenarios, I have offered the hospitality of our home to helpers who have arrived early, and we have helped others organize both hotel accomodation after they have excavated with us and guest-house ("pensión") accomodation and personal tutors in the Spanish language! So, the short answer is, "Yes, we will do our best to help your personal requirements", and the long answer is, "We can do that best, if you help us by giving me two or three months' advance notice of what you want to do". Remember, we are in a prime tourist area and planes and accomodation are in great demand during July and August, SO DO YOUR BOOKING EARLY IN THE SPRING.

For **EMERGENCY RAPID CONTACT**, up to about June 15<sup>th</sup> please contact my fax which is 34-868-883963 from outside Spain or 868-883963 inside Spain, or my e-mail which is *walker@um.es*. If there is an **EXTREME EMERGENCY**, and you need urgently to phone me *BEFORE* June 30<sup>th</sup> you can try to reach me (I *cannot* guarantee to be there as I am often travelling in England at the end of June) by telephone *provided you find out from the international operator that the time is between 6 a.m. and midnight CENTRAL EUROPEAN TIME* - so as not to wake up my family during the night. If dialling from a country outside Spain try (home) 34-968-265608, (home) 34-966-769367, or (work) 34-868-884997, or cell phone 34-620-267104. If dialling from anywhere within Spain those numbers become 968-265608, 966-769367, 868-884997 and 620-267104.

## **FUNDING OUR FIELD RESEARCH**

### **CONTRIBUTIONS AND RELATED MATTERS**

For attendance at one full 21-day session your contribution is rated at 50 euros, 50€, per day, for bed, light breakfast, mid-morning sandwich, cooked lunch, cooked supper, laundry, instruction, transport between base camp and site, excursions, transport between Murcia Airport to our base on official pick-up and set-down dates, 2018 membership of MUPANTQUAT (attendance at both sessions entitles you to a reduction to 45€ per day; first-time attendance for less than a full 21-day session is rated at 60€ per a day). A non-returnable deposit is required and because of that you might want to take out holiday insurance in case of last-minute inability to come. The deposits are made to MUPANTQUAT and are rated at 250€ per week for each week of your intended stay, with the full balance payable on arrival.

Deposits **guarantee your reservation** so it is advisable to make them, for whichever session (whether Session 1 or Session 2) **before May 1<sup>st</sup>** in order to avoid disappointment. If no deposit has been made by May 31<sup>st</sup> the place will be reassigned to applicants on the waiting-list.

Deposits, alas, are non-returnable. The reason for that is as follows. Because the Murcian region is a Mediterranean coastal holiday-resort area that is very popular with both Spaniards and other European vacationers, inward-bound and outward-bound flights and trains are heavily booked well in advance of the July-August high summer season. They are often fully booked up by early June. So even if we have someone on the waiting-list when you drop out, that person might not be able to book a flight only a very few weeks before the session begins. This means we might well have to use deposited moneys in order to try to tempt one of our local undergrads to take your place instead of taking a well-paid vacation job in a bar or restaurant beside the packed beaches or at a golf resort, because, in order to have adequate help on site at all times so that we can carry out our excavations efficiently we need always to have on site a basic minimum number of people, below which we cannot work smoothly.

Our annual summer field school and excavations rely on self-funding. As just stated, a major field project has a number of fixed costs that must be met; indeed, one such cost is in maintaining a skeleton staff on hand to conduct the basic physical work of excavation in the event of a short-fall in participants. If intending short-listed helpers who have paid their deposit are unable to come at the last minute, it will very probably be far too late even for airline tickets to be obtained at all by any other possible helpers who had been relegated to a waiting-list, and perhaps too late even for us to contact them in order to ask if they would be willing to come in place of whoever has not been able to. This is why we are not able to return deposits; there are simply too many fixed costs for this to be feasible. Under particularly exceptional circumstances responsible for inability to attend, though, and providing our principal costs were more or less covered, it may just be possible for us to be able occasionally to offer to offset a deposit made in one year against cost of participation by the helper in a following year, though we cannot guarantee to do so.

A few years ago we reserved places for some people who had not sent deposits whom we felt we could trust, but who for medical or other understandable reasons found themselves unable to attend, when it was too late for us to contact other people who might well have liked to have taken their places and paid the due amount. As a result we were struggling financially to make ends meet. So we had to take the hard decision NOT, from then on, to hold any place if the deposit for it has not been received by May 31st; nor can deposits be returned, as by then it is getting too late to find replacements for you – even if they are willing to come, flights may be fully booked already in May (let alone June), because July and August are the summer “high season” and Murcia’s beaches and golf-courses attract dense international tourist traffic. It might therefore be useful to take out insurance against inability to attend; then, in the event of having to make a claim to your insurance company, a statement from us indicating the deposit received and its purpose would be sent *directly to your insurance company* provided you send us the reference number to your claim and your company’s (or its official agent’s) address.

Currency fluctuations can cause problems. In order to minimize these we insist that payments must be made always in € euros, including payment of outstanding balances of your contributions on arrival. We have a Spanish bank account thanks to the creation of our new association MUPANTQUAT into which deposits should be paid in euros by international bank transfer. If you decide that you wish to take part you will be sent details by ordinary postal airmail (because we think it is unsafe to send bank details over internet, whatever some people may say to the contrary).

We do not have credit card facilities. Quite often credit cards issued in countries outside Spain fail to work in Spanish automatic cash machines or automatic teller (ATMs). You must insist at your local bank branch that it validates your cards so that they can work in other countries. Alas, even when the cards have allegedly undergone electronic modification by your home bank to enable them to work outside your own country, they may not work. (I once found my validated Spanish credit card failed to work in neighbouring France!) That is why you should bring at least 100€ in euro bank-notes to guard against having your having no cash here if your card gets swallowed up by an ATM machine that claims it to be invalid and retains it because it thinks it might have been stolen or be a fake. This was to my advantage when my credit card was stolen and thieves tried using it at an ATM machine 100 km away; I had alerted my bank and police, so when they tried using it at an ATM the card was retained within the machine, the bank alarm went off, and the police soon rounded up the thieves!

We cannot accept either bank cheques or travellers’ cheques (not even American Express cheques) because in the past few years tight EU banking regulations demand that nowadays they can only be cleared by banks in EU Member States if intrusive personal details are provided of people who have signed cheques and sent them (such as full names, addresses, ID, and 20-digit international personal bank account information), and travellers’ cheques can no longer be cashed at Spanish banks which will only clear them if they are paid into a named bank account at the branch in question when they are treated for tax purposes in Spain as personal earned income by the holder of that account, so nobody is prepared to receive such money from you!

By no means all countries of the European Union use the euro €, but nevertheless there is a common flat-rate fee for currency conversion within the EU, and there are never any problems. For unfathomable reasons, even though daily newspapers world-wide offer exchange rates, and worldwide currency conversion is available at the click of a mouse, US and Canadian banks seem utterly clueless, and their witless bank clerks often allege to clients that they cannot frontload a debit from an account in order to make a currency purchase of euros by adding the corresponding charge for currency conversion to that debit. This is utter rubbish. The truth is that they either cannot be bothered to find out how to do it, or have been instructed from above not to do it because it allegedly takes up too much of the company’s time. Don’t take no for an answer! Remember, the customer is always right! You can always use the nuclear option of threatening to take your account to another bank! (Curiously, Australian banks rarely give problems of this kind, unlike North American banks.) However, be warned that if the deposit in euros received by us is less than the amount in euros required for the deposit, because your bank has failed to frontload a debit from your account with currency-conversion/transfer costs, then a surcharge of 25€ will be added to the balance outstanding for your contribution payable on arrival, so it is very much to your advantage to hassle the clerks at the branch where you bank back home before you travel!

## **INSURANCE**

All participants must arrange their own health and personal accident insurance cover before leaving home. EU residents should bring the EU form from their country that entitles them to public health care in other EU Member States. For reasons already given above, you should take out holiday-travel insurance, especially against unforeseen needs to cancel your arrangements.

## **WHERE YOUR MONEY GOES TO**

Accommodation and food are included in the overall charge, as is instruction and local transportation by us, including group excursions. A major field project has a number of fixed costs that must be met. One such cost is in maintaining part-time staff. Our basic staff largely consists of about half-a-dozen local undergraduate and graduate students who help in the study of the excavated material throughout the year in my research laboratory at Murcia University. In the field, they help with giving basic instruction, and one or two even bring a private vehicle to give us greater transportational flexibility. Several staffers have long experience of our field

techniques, some of which require special technical skills. Most have neither regular income nor undergraduate or postgraduate student grants. In return for their services, paying for their board and lodging is one of our fixed costs in the field, therefore, and one or two of the most experienced graduates receive a small emolument. Another fixed cost, of course, is the wages of our professional cooks and cleaning staff - wages that are the same whether we be fifteen or thirty at table! Yet another set of irreducible costs is the maintenance of vehicles and maintenance or acquisition of field equipment, and sometimes its replacement after seasons of wear and tear. Recently, our *MUPANTQUAT* association which since 2012 runs the excavations and Field School has invested considerable money in acquiring new equipment, notably, 12 new geological sieves, a new field microscope, a strong safe cabinet for the safe-keeping of the Sima de las Palomas Neanderthal skeletons, and a compressor and vibroscalpels for cleaning them.

## **WHY DEPOSITS ARE NON-REFUNDABLE**

Our annual summer field school and excavations rely heavily on self-funding. As just stated, a major field project has a number of fixed costs that must be met; indeed, one such cost is in maintaining a skeleton staff on hand to conduct the basic physical work of excavation in the event of a short-fall in participants.

If intending short-listed helpers who have paid their deposit are unable to come at the last minute, it will very probably be far too late even for airline tickets to be obtained at all by any other possible helpers who had been relegated to a waiting-list, and perhaps too late even for us to contact them in order to ask if they would be willing to come in place of whoever has not been able to.

This is why we are not able to return deposits; there are simply too many fixed costs for this to be feasible. Under particularly exceptional circumstances responsible for inability to attend, though, and providing our principal costs were more or less covered, it may just be possible for us to be able occasionally to offer to offset a deposit made in one year against cost of participation by the helper in a following year, though we cannot guarantee to do so.

## **OTHER SOURCES OF INCOME**

Self-funding is necessary for our summer field school and excavations to take place every year. Why?

Well, in the first place, Murcia University does not make money available to us for research, because, like most Spanish universities, it receives public funds that are ear-marked exclusively for teaching purposes. Some financial assistance for research is occasionally forthcoming from Spain's national Ministry of Education and Science, for which research groups have to compete at national or regional level, and sometimes help comes from the private sector or individuals.

In universities, research would come to a standstill were it not for the enthusiasm and self-sacrifice of unemployed young graduates, as there are very, very few grants for graduate or undergraduate students to help them live from day to day. It goes without saying that staffing at universities is quite inadequate for their research endeavour (technical back-up staff is utterly inadequate), and this is because staffing is determined by what Education regards as necessary to instruct undergraduates, whereas Science and Technology will not usually pay for research staff at universities, only at scientific research institutes. The official unemployment rate in Spain is around 20% but many "employed" people are on contracts that may only last for six weeks or so at a time, throughout the entire Spanish economy.

Even when official research grants are awarded to university research groups, there are several strings attached, as we have found after having had some. First of all, unemployed graduate students are debarred from receiving any support from them, because official grants can only be spent (with obligatory detailed accounting) by salaried employees at public institutions. Secondly, in order to acquire such a grant, usually at least four or five such employees must propose a project, but the flip-side is that any grant awarded will be divided up in equal proportions between them, rather assigned to the overall needs of the project; this means that those who are actively involved in the project, rather than those "sleepers" whose signatures were needed to put up the proposal, get a lower proportion of money to spend on the project than the project itself needs in order to come to fruition. Thirdly, there are severe limits imposed by the Spanish bureaucracy on the proportion of the overall grant that may be assigned to living expenses or travelling expenses, because the bureaucrats want to see receipts for material purchases that give "added value" to the stock-inventory of the university department that is officially in receipt of the grant, because they hold that the main purpose of official grants is, first and foremost, to upgrade the physical infrastructure required for a department's research.

Those three sets of problems lead to major short-falls for field research, which is labour-intensive rather than needing expensive laboratory equipment, and involves maintenance and travelling costs of many people. This is why field research projects rely on support from individual helpers.

Alas, we had no public grant for 2008 whatsoever and although we received one in 2009 there was no state aid available in 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017 or 2018 owing to the severe economic crisis here in Spain and there will be none in 2017. Just to let you know what official support has been received in the past, here are some brief details. The real grants received are 87.5% of the amounts shown below because Murcia University administrators retain 12.5% (one-eighth) of each grant for putative "administrative overheads". In November 2002, the Spanish Government's Ministry of Science and Technology announced the award to me and 6 institutional colleagues to continue work at *Sima de las Palomas* and *Cueva Negra* of Major Research Grant BOS2002-02375 of 50,000 euros for the triennium 2003/2004/2005. In October 2005 it made available a small grant for 2006 of 6,000 euros (CGL2005-02410/BTE). Most of this money had to be spent on infrastructure at the university departments to which the official signatories of the project belong, as they are mainly university lecturers or professors or public service researchers, who spend little time with us in the field, alas. Nevertheless, this was an extremely gratifying recognition of our research endeavour over the years. It was the third such governmental award we received. At the end of 1999, the Spanish Government announced the award of Major Research Grant PB98-0405 to us for the triennium 2000/2001/2002, though unfortunately the total sum of money awarded was a mere 24,000 euros altogether

(barely \$9,000 a year). The first such award we received for our project was for the 3-year period 1994/1995/1996. The *Murcian Regional Government* has also made small grants for 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003 and 2004. These annual grants have ranged from 3,000 to 10,000 euros. In September 2007 we were extremely lucky to obtain a 30,000-euro grant from the *Regional Government* which allowed us to buy much new equipment for our 2008 field season, including -for site-surveying- an expensive *TopCon* "Total Station" and a portable computer for its use, new platforms and scaffolding for the tower in Sima de las Palomas, many new books and monographs, etc.; all the money had to be spent by mid-December 2007. In 2009 we received a grant of about 25,000 euros and once again all of the money had to be spent by the end of the year; unfortunately the scaffolding tower required further considerable expense in order to bring it into line with updated safety requirements, and we also had to acquire a new water pump and another safe for guarding the Neanderthal remains, whilst dating at overseas centres also involved further expense.

From 1995 to 2001 volunteers who belong to *The Earthwatch Institute* helped in our field research. Their help and support was greatly appreciated, though it has to be said that the experience for each of them was more expensive than the charges we are making now - this was because the *Institute* was charging each one around eighteen-hundred dollars per 14 days per person, of which our project received less than one thousand, the rest going to the *Institute's* overheads. By cutting out the intermediary and extending to 21 days each of our sessions, we are able to offer you a far better deal. (I seem to recall that the organization also insisted on receiving non-returnable deposits from intending volunteers.)

(The *Spanish Government* and *British Council* have also paid for joint Anglo-Spanish exchanges of scientists in 1993-4 and 1996-7 in connexion with the project; these were principally with *Oxford University*. Much scientific research is paid for by arrangements with other institutions. Thus, as mentioned earlier, a U.K. Government *NERC* grant to Oxford's *Research Laboratory for Archaeology and the History of Art* has supported some dating at Cueva Negra, whilst other dating there has been done at the Laboratory's own expense. Other institutions have also done specialized work for us for free, though a list of these would be boring here.)

## LOOKING AFTER YOU ACCOMODATION

Cueva Negra helpers will be accommodated throughout in *Caravaca de la Cruz* at the "Colegio Público "Ascruz" de Educación Especial" (Residential Public School "Ascruz" for Disabled Children). The children are away on holiday when we use the school. There are hot and cold showers and conventional sanitation, in separate men's and women's facilities. Meals are provided in a dining room. There is a common room and also a large well-lit workshop where we wash and sort our finds. There are bunks in separate men's and women's dormitories. A separate room may be made available for a couple, depending on how many people we are altogether and how many dormitories we need. You need only bring towel, sheets and pillowslip. You must bring soap or shower-gel and shampoo. Our cooks-cum-housekeepers take men's dirty clothes one day alternating with women's clothes another day, for washing separately in the large industrial washing-machine at the school, which can only work with full loads; once washed, the clothes are hung out on the washing-line to dry, before being ready for you again. There is an iron if you want to use one. All of us have to make our own beds and help keep dormitories tidy, and keep toilets clean by using the lavatory brushes. A professional cleaning staff sweeps and mops the floors and bathrooms.

Sima de las Palomas helpers will be accommodated throughout in the village of Dolores de Pacheco, where we take three meals a day at the restaurant of the "Centro Cívico" (Civic Centre) which has its own cooks. 400 metres away, we sleep in bunks in separate men's and women's dormitories, converted temporarily for us from class-rooms in the roomy village school which has showers with hot and cold water. We use large class-rooms for washing and sorting finds. A separate room may be made available for a couple should this be requested in advance. We use the village swimming pool and its shower block with hot and cold showers, which is half-way between the Civic Centre and the school. You need bring only towel, sheets and pillowslip. You must bring soap or shower-gel and shampoo. We collect men's dirty clothes one day, alternating with women's clothes another day, for washing separately in a large industrial washing-machine and drier at a nearby establishment, which can only work with full loads. All of us have to make our own beds and help keep dormitories tidy, and keep toilets clean by using the lavatory brushes. A professional cleaning staff sweeps and mops the floors and bathrooms.

## FOOD

All meals you take are included in the charge. This way we pay for the food and cooks whose responsibility it is to organize the catering in accordance with their experience and skills. The standard of catering is high. The Spanish cooks at both the Caravaca "Ascruz" Residential School and the Dolores de Pacheco Civic Centre are of the highest calibre.

**We CANNOT offer either "Vegan" menus or kosher or halal cooking.** Helpers may **NOT** use the kitchens to cook for themselves. Special diets **CANNOT** be provided, **and that goes for vegetarians too**, although those non-rigid vegetarians who eat fish, shell-fish, milk, cheese, yoghurt, and eggs, or who have no objection to sauces or soups based on strained meat or chicken broths, will find they will easily get enough to eat if they simply avoid eating pieces of actual meat; eggs or cheese can readily be supplied for them if they feel hungry -- **"Vegans" and all others who adhere rigid to particular dietary restrictions CANNOT BE CATERED FOR.**

Murcian lunches and dinners are invariably accompanied by communal platters of mixed salad, and there is no shortage of fresh fruit. Because our word "salad" simply means "salted", and salted is the meaning of the Spanish word "ensalada", it is no surprise that in Spain the platters are obviously served prepared with salt, olive-oil and vinegar or lemon-juice, and everyone digs in with his/her fork into the communal platters (it is considered the height of bad manners in Spain to remove some of it onto your own plate). Lettuce with tomato cannot by itself be a "salad" without violating the meaning of the word! Diabetics, or people who require low fat or low sodium diets will have to juggle with these options for themselves, bearing in mind that vegetable oil (olive oil) is used far more in Mediterranean cooking than unhealthy animal fats. **Special diets CANNOT be offered, however.**

It should be remembered that meals are of typical Spanish food, and eaten at typical Spanish hours which are much later than those in northern Europe or North America. Breakfasts are light and taken early: coffee, bread rolls or toast, cereals, fruit juice. A mid-morning sandwich is taken to the site together with appropriate cold water. Luncheon is usually after 15.15 hours and is a copious cooked meal. Dinner is no earlier than 21.00 hours and is another copious cooked meal. Wine, beer, soft drinks, and water are provided with lunch and dinner. Tap water is safe to drink, but bottled water is also available. We all usually sit down at table as one man to main meals which are an opportunity for chitchat and relaxing.

Spanish cooking contains two ingredients that are not to everybody's taste, but which simply cannot be eliminated, namely, olive oil and garlic. For people who have no problems with those, the meals are delicious and very filling. Typical dishes range from delicious barbecued yearling lamb chops, pork chops, steak, fried chicken, fish, stews based on potatoes, chickpeas, lentils or beans, stir-fried vegetable dishes, and rice dishes based either on chicken and rabbit or on chicken and shellfish.

Soups, hors d'oeuvres, pastas, and omelettes - especially the potato and onion omelette known as "tortilla española" - are often served as first courses at lunch. A local Murcian speciality is a meat pie baked in mouth-watering flaked pastry ("pastel de carne").

Murcia is renowned in southern Spain for its gastronomy. It has a staggeringly wide range of taverns and restaurants for eating out. You can either eat out on the basis of drinks and *tapas* (snacks) or you can have slap-up sit-down meals. Depending on the venue, you can reckon on paying anywhere from €4 euros to €40 euros. Often the cheapest places offer food and wine every bit as good as the most expensive. That is where our Spanish project volunteers and senior site helpers - especially our students - can assist other helpers, especially those from other countries,, because they go to places which are within their modest means! Our excursions often take in typical bars and eating places, allowing us to sample local food and wine.

Although olive oil and garlic are fundamental ingredients of Murcian cooking, it is not heavily spiced by and large, although some dishes traditionally contain cloves, chili peppers, or other spices. Usually, however, hot peppers are offered on small dishes, together with olives, for people who wish to accompany their meals with those.

People from northern Europe or North America often feel that Spanish cooking has much stronger flavours than they are used to at home. It is a very healthy low cholesterol and high fibre diet -- which in itself is enough to make your bowels looser than you might be accustomed to. These aspects, together with hard work in great heat, can sometimes make people feel queasy and uncomfortable - not just foreigners, because Spaniards, too, get funny tummy troubles in summer. The solution is to come armed with a standby of a kilogram of your favourite, high-calorie, concentrated nibbles, and to drink still fruit juice rather than fizzy drinks or cheap Spanish spirits. By contrast, most proprietary pharmaceutical preparations (such as "Enterovioform" pills) are of questionable pharmacological worth. If you need medication, I will make sure you take something which is medically appropriate; I am a British medical graduate and for many years was a medical practitioner in the Australian state of New South Wales.

## **PHYSICAL CONDITIONING/MEDICAL ADVICE**

Although no great physical fitness is necessary, the project is not suitable for severely physically or mentally disabled, lame, deaf, or poor-sighted people, nor for people who are very overweight, suffer from advanced degenerative joint disease, or from haemophilia, cardiovascular or heart ailments, or suffer great discomfort or extreme sunburn in hot weather. There are daily uphill walks of about 15 minutes up to the sites from where our vehicles have to stop. This may have to be repeated during the morning in order to carry out service tasks.

Physical demands on you may involve any or all of the following: walking and scrambling, kneeling and scraping, digging with mattock or pick, bending and sieving, pushing wheelbarrows, carrying loads, sitting. None of these is likely to last for longer than a couple of hours at a stretch on any one day, since you can be switched from one task to another if you feel uncomfortable. Probably the heaviest tasks involve heavy digging and carrying 10 kilogram bags of soil downhill at *Sima de las Palomas* when the sun's heat is severe.

It is *ESSENTIAL* that you inform me of any health problems before you come so that they can be taken account of fully.

For the walk up to *Cueva Negra*, you only really need stout shoes or joggers, although walking boots are useful for field excursions and walking off the footpaths; once inside *Cueva Negra*, however, you must bring footwear to change into which has no pattern on the sole, such as flat-soled sneakers, plimsolls, pumps, slippers or sandals, because otherwise hideous footprints are left behind in the soil which spoil our photographic records. At *Sima de las Palomas* conditions are very different, and firm boots with a heel should be worn at all times, both because of the rocky nature of the hillslope and the demands of working on scaffolding.

When we are wet-sieving, the Project has several pairs of rubber boots available for those people who, like me, don't like getting their other footwear soaked and muddy. In fact, wearing muddy footwear is forbidden inside *Cueva Negra*, because wet mud and damp footprints show up starkly against the dry soil and spoil the photographs.

Shorts, sunhats and gardening or work gloves are appropriate wear, along with sunglasses and your preferred suntan lotions or creams. There will be opportunities for swimming also, so remember to pack swimming togs.

As a British medical graduate and registered medical practitioner in New South Wales (Australia), I strongly recommend all intending volunteers to ensure their anti-tetanus vaccination is upto date, and that, if they are asthmatic, diabetic, or suffer from allergic disorders, they bring with them their customary medications. Those with back or knee problems should bring with them appropriate corsets, girdles or elastic athletic supports.

People who suffer from vertigo in high places, or from claustrophobia in enclosed ones, are recommended to come to *Cueva Negra* in preference to *Sima de las Palomas* though even at *Sima de las Palomas* they can be given tasks on the hillside which avoid exposing them to conditions that otherwise might precipitate attacks inside the shaft or on the scaffolding tower.

There are efficient public hospitals both at Caravaca (Hospital del Noroeste) and not far from Dolores de Pacheco (Hospital de Los Arcos at Santiago de la Ribera), in each case about 15 minutes drive from our sites. The city of Murcia has 3 large public hospitals, about an hour's drive from our sites. If a medical emergency arises it should usually be possible to deal with it efficiently.

Helpers should find out whether their home country has reciprocal health agreements for automatic free treatment at Spanish public hospitals. Most European Union countries do, **but you nevertheless have to fill out a form before you leave your home E.U. Member State which allows you to be given the card you must bring here entitling you to public treatment in other EU countries on the same basis as their own nationals.** If your home country is outside the EU and therefore has no reciprocal arrangement with it, then Spanish public hospitals will demand accounts to be settled on discharge by patients, who may then present the official receipts afterwards to their own health insurance companies for possible reimbursement on their return home. Be sure to find out *precisely how* your private health insurance company requires receipts you present to be made out by the purveyor of services involving your hospital, medical, dental or pharmaceutical expenditure, lest it reject them when you return home.

Helpers who prefer private health treatment in Spain will usually have to pay immediately in cash for treatment, and present the official receipts afterwards to their own health insurance companies for possible reimbursement on their return home. There are, however, some private hospitals and doctors who work with private health insurance schemes which have reciprocal arrangements with those in some other countries (thus, British BUPA members could ask in Britain if there are reciprocal arrangements with BUPA's affiliated company in Spain).

The Project is not responsible for paying hospital, medical, dental or pharmaceutical bills of helpers. Before you come, you should have made your own arrangements for health, injury or disability insurance in connexion with illness or accidents which might be sustained during your participation in the Field School.

*Health conditions around the world are constantly changing, so we recommend that you consult your local public health department or, in the United States, the Centers for Disease Control in Atlanta at (404) 639-2572 for the latest health information for travellers.*

## **FIELD COMMUNICATIONS, PHONE, INTERNET**

Internet access is available at both our field bases though it can be erratic for reasons beyond our control; nevertheless, we usually get buy! Our field bases usually have cell phone cover though Dolores de Pacheco is in a coastal holiday area where there is often saturation of the phone system in July and August which sometimes means that telephone calls from elsewhere do not always get through. At our excavation sites, however, there is usually neither internet cover nor reliable cell phone cover.

You can be reached by mail. It is advisable for letters to be REGISTERED and marked AIRMAIL and URGENT in order to ensure fast delivery, which may still mean up to 5 consecutive working days from the U.K. to Spain, or more from outside Europe.

Addresses and phone numbers of our accommodation bases are given below. Please advise friends and relatives to make phone calls only between 15.00 and 24.00 hours Central European Time (if in doubt about European time, check with the international operator):  
*June 29<sup>th</sup>– July 20<sup>th</sup>, 2018: Cueva Negra*

**Colegio Público "Ascruz" de Educación Especial  
Camino Mayrena 13 (El Copo)  
30400 CARAVACA DE LA CRUZ  
Murcia**

Spain

**Telephone: from outside Spain dial 34-968-700844, -708151, within Spain 34-968-700844, -708151**

*July 20<sup>th</sup> - August 10<sup>th</sup>, 2018: Sima de las Palomas*

**Centro Cívico  
30739 DOLORES DE PACHECO  
Torre Pacheco  
Murcia**

Spain

**Telephone: from outside Spain dial 34-968-173020 or 34-685-111111, within Spain 968-173020 or 685-111111**

## **FIELD SUPPLIES**

You **must bring** sheets, pillowslip and towel, as well as soap and shower gel and shampoo. The warm nights mean you do not need blankets or insulated sleeping-bags. Sheet sleeping-bags (Youth Hostel type or similar) are fine, however. Recommended clothes are shorts, sunhat, sunglasses, and work or gardening gloves. Swimming togs can be used at the pool, especially at Dolores de Pacheco. Firm boots are useful for field excursions and essential for fieldwork at *Sima de las Palomas*. Inside *Cueva Negra*, it is essential to wear flat-soled footwear which has no pattern on the sole whatsoever, such as flat-soled sneakers, plimsolls, pumps, slippers or sandals. I recommend volunteers to bring a small haversack to carry their personal daily bits and pieces to the site. Your clothes can be brought out in a backpack, grip, or suitcase.

*Lost luggage is a recurrent problem for travellers, whether taking short domestic flights or journeys around the globe. We recommend that you take a carry-on bag with a set of field clothes - and shoes - plus any personal essentials so that you will not be uncomfortable or incapacitated if your baggage takes several days to catch up with you.*

# READING SUGGESTIONS

## NON-FICTION

Here are some reader-friendly, well-illustrated, easy-to-handle general books by reputable scientists that I like:

The Complete World of Human Evolution by Chris Stringer and Peter Andrews (2005, London, Thames and Hudson; this probably has a different US publisher, and there is also a Spanish edition published by Akal) (Chris is professor at London University's Imperial College and director of Palaeontology at the London Natural History Museum);  
The First Humans edited by G.Burenhult (1993, University of Queensland Press - there is a different US publisher of the United Nations-sponsored series to which this volume belongs, but I don't know who it is).

Absolute novices who feel human evolution might be a daunting subject to tackle, especially middle-aged readers approaching it for the first time in their life, might do worse than thumb through the brief *Early Man* by Paul Jordan (1999, Sutton Pocket Histories) before reading anything else.

I always recommend my undergraduates to get back to basics, and read the brief and well-illustrated  
The Old Stone Age by the late François Bordes (1968, London, Weidenfeld & Nicolson) and also  
The Palaeolithic Age by the late John Wymer (1982, London, Croom-Helm), both of which should be in university or museum libraries and possibly in major public libraries.

Two magnificently illustrated coffee-table books certainly should not be missed are:

The Last Neanderthal by Ian Tattersall (1995, New York, Macmillan) and  
From Lucy to Language by Don Johanson (1996, New York, Simon and Schuster).

I wrote Palaeolithic Pioneers, Behaviour, Abilities, and Activity of Early Homo in European Landscapes around the Western Mediterranean Basin ~1.3-0.05 Ma (Archaeopress, Oxford, 2017) – a long title for a short book! - because few books deal well with Early and Middle Pleistocene human evolution in Europe before the Neanderthals. Usually it is relegated to a short section in books that give a worldwide account of human evolution, and among the better ones is Reconstructing Human Origins: A Modern Synthesis by Glenn C.Conroy (1998, New York, W.W.Norton, 1998). Whereas I prefer to take up an intermediate stance, a problem common to most books is that they tend to favour extreme one-size-fits-all theoretical explanations, either appealing, on the one hand, to "multiregional" Pleistocene human evolution in the case of the weighty Palaeoanthropology by Michigan University professor Milford H.Wolpoff (1999, New York, McGraw-Hill), or, on the other, to dogmatically "cladogenetical" Pleistocene human evolution in the cases of The Human Career, Human Biological and Cultural Origins by Stanford University professor Richard Klein (London and Chicago, Chicago University Press, 3<sup>rd</sup> edition, 2009; a redeeming feature here is the combination of human skeletal evolution with Palaeolithic archaeology) and of The Origin of Modern Humans by journalist Roger Lewin (1993, New York, Scientific American Library) and Principles of human evolution also y Roger Lewin (1998, Oxford, Blackwell Science). For early stone tool-making I recommend Stone Tools in Human Evolution: Behavioral Differences among Technological Primates by John Shea (2016, Cambridge University Press) and our brief Early Evolution of Human Memory: Great Apes, Tool-Making and Cognition (H.M.Manrique & M.J. Walker, 2017 Palgrave-Macmillan/Springer-Nature, New York), and I quite like both Landscape of the Mind: Human Evolution and the Archaeology of Thought by John Hoffecker (New York, Columbia University Press, 2011), and the thoughtful Timewalkers: The Prehistory of Global Colonization by Southampton University professor Clive Gamble (1993, Stroud, Alan Sutton) which takes an interesting approach to biology, though it is short on drawings and illustrations. A quite short but most authoritative book is The Evolution of Homo erectus: Comparative Anatomical Studies of an Extinct Species by SUNY Binghamton professor G.Philip Rightmire (1990, Cambridge University Press).

First-year undergraduate textbooks on physical anthropology for beginners are, alas, far too general and far, far too cursory with regard to human evolution in Eurasia between 1,500,000 and 15,000 years ago, though among better textbooks for beginners are: The Human Lineage by Matt Cartmill and Fred H. Smith (2009, Wiley-Blackwell, New York).

Exploring Biological Anthropology: The Essentials by Craig Stanford, John S.Allen and Susan C.Antón (2009, Upper Saddle River, New Jersey, Pearson Prentice-Hall)

How Humans Evolved by Robert Boyd and Joan B. Silk (2010, New York, W.W. Norton)

Introduction to Physical Anthropology by Robert Jurmain, Lynn Kilgore, Wenda Trevathan and Russell L.Ciochon (2013-2014, Wadsworth Publishing, "Cengage Learning")

Here are some other quite short books that could interest you:

Catching Fire: How Cooking Made Us Human by Richard Wrangham (2009, London,Profile; New York, Bantam)

The Palaeolithic Origins of Human Burial by Paul Pettitt (2010, London, Routledge)

How to Think like a Neanderthal by Fred Coolidge and Tom Wynn (2012, Oxford University Press)

A Brain for All Seasons: Homo erectus and Abrupt Climate Change by William H.Calvin (2002, London and Chicago, University of Chicago Press)

Genetics and the Search for Modern Human Origins by John Relethford (2001, Chichester and New York, Wiley-Liss)

There are several books that home in on Neanderthal folk and here are some easy reads by reputable authors:

In Search of the Neanderthals by Chris Stringer and Clive Gamble (1993, London, Thames and Hudson)

Neanderthal Man by Myra Shackley (1980, London, Duckworth)

Neanderthal Man: In Search of Lost Genes by Svante Pääbo (2014, New York, Basic Books)

Wild Men: Yeti, Sasquatch and the Neanderthal Enigma by Myra Shackley (1983, London, Thames & Hudson)

The Humans Who Went Extinct. Why Neanderthals Died Out and We Survived by Clive Finlayson (2009, Oxford University Press)

How To Think Like A Neandertal by Thomas Wynn and Frederick Coolidge (2012, Oxford University Press)

Neanderthal by Paul Jordan (1999 and 2001, Stroud, Alan Sutton),

The Neandertal Enigma by James Shreeve (1995, New York, William Morrow)

The Neanderthals Rediscovered by Dimitra Papagianni and Michael A.Morse (2013, London, Thames & Hudson)

Slightly more challenging but quite short are:

The Rise of Homo sapiens: The Evolution of Modern Thinking by Frederick Coolidge and Thomas Wynn (2009, Chichester and New York, John Wiley)

Cognitive Archaeology and Human Evolution, edited by Sophie Archambault de Beaune, Frederick Coolidge and Thomas Wynn (2009 Cambridge University Press)

The Foundations of Cognitive Archaeology by Marc A. Abramiuk (2012, London and Cambridge Mass., MIT Press)

Cognitive Models in Palaeolithic Archaeology edited by Frederick Coolidge and Thomas Wynn (2016, Oxford University Press);

Somewhat longer and in my opinion rather dated is:

Human Evolution, Language and Mind, A Psychological and Archaeological Inquiry by William Noble and iain Davidson (1996, Cambridge University Press)

Longer still, but well worth the effort of reading, is

The Evolution of the Human Head by Harvard University professor Daniel E.Lieberman (2011 The Belknap Press of Harvard University Press).

And of course there is our weighty (unreadable) The People of Palomas. The Neandertals from the Sima de las Palomas del Cabezo Gordo, Southeastern Spain, edited by Erik Trinkaus and Michael J. Walker (2017, Texas A&M University Press, College Station, Texas).

The past twenty years have seen some excellent new books for specialist students majoring in Prehistoric Archaeology, Human Palaeontology and Physical Anthropology, and for graduates in the subjects. A useful short picture book with explanatory text is Handbook of Palaeolithic Typology Vol. 1 Lower and Middle Palaeolithic of Europe by André Debenath and Harold L.Dibble (1994, Philadelphia, University of Pennsylvania University Museum). Most important is the authoritative The Neanderthal Legacy by Cambridge's Professor Sir Paul Mellars (1996, Princeton, Princeton University Press). The Palaeolithic Societies of Europe by Clive Gamble (1999, Cambridge University Press) is interesting but somewhat heavy going - it presumes readers already have a reasonable grasp of European Palaeolithic archaeology and typology and makes few concessions to those who lack them. Advanced students will find some articles relevant to SE Spanish Early Pleistocene archaeology in The Cutting Edge: New Approaches to the Archaeology of Human Origins, edited by Kathy Schick and Nicholas Toth (2009, Gosport IN, The Stone Age Institute, and Bloomington IN, Indiana University, The Stone Age Institute Press, Stone Age Institute Publication Series Number 3).

The past twenty years have witnessed a flood of edited volumes, particularly about Neanderthals and how anatomically modern humans after about 45,000 years ago in Europe are to be regarded in relation to them by physical anthropologists and Palaeolithic archaeologists. I have most of these books in my private library, but it would be invidious to mention just one or two of them, particularly because our Field School excavations do not deal with times later than about 45,000 years ago nor with anatomically modern humans, let alone Upper Palaeolithic archaeological artifacts. All the same, there are a couple of books you might be interested in looking at, namely, The Nature of Paleolithic Art by R.Dale Guthrie (2005, Chicago and london, University of Chicago press), and Rock Art of the Spanish Levant by Antonio Beltrán (1982, Cambridge University Press) – a Session 1 excursion will visit some sites shown in Beltrán's book.

## FICTION

Very distinguished writers have written about Neanderthals in fictional form. Among them are H.G.Wells (of *War of the Worlds* and *Time Machine* fame) whose 1921 short story "The Grisly Folk" can be found in any good public library , republished in his *Selected Sort Stories* (Harmondsworth, Penguin Books, 1958). You should also be able to find there William Golding's novel *The Inheritors* (London, Faber & Faber, 1955) - Golding won a Nobel Prize for Literature and his most famous novel is *Lord of the Flies* (about schoolboys on a desert island). The eminent Quaternary palaeontologist Björn Kurtén also tried his hand at an excellent novel called *The Dance of the Tiger* (1980) which you may be lucky enough to find in the library. Isaac Asimov also had a go, with his short story "The Ugly Little Boy" which you can find in his book *The Best Fiction of Isaac Asimov* (1958, London, Grafton) and your library most likely has it too. Other well-known novels include J.H.Rosny-Aîné's *The Quest for Fire* (1982, Harmondsworth, Penguin - originally published way back in 1911 in French) - which also was made into an excellent film that your local video shop no doubt can get you - and Jean Auel's *The Clan of the Cave Bear* (1980, Toronto & New York, Bantam Books) which was also made into a (not so good) film; Jean Auel subsequently published another novel, *The Mammoth Hunters*. Finally, there is the Spielberg film of John Darnton's novel *Neanderthal* (1996, London: Hutchinson and New York, Random House) about which the less said the better!

## NEANDERTHAL VIDEOS

Research at our two sites has stimulated public interest, reflected in several documentary films, which include

"Decoding Neandertals" shown by PBS-Nova in USA and elsewhere on January 13 2013, produced by the London-absed company Arrow Productions (<http://www.youtube.com/watch?v=3nH1fqd0Ryo>; [http://www.youtube.com/watch?v=R00ZT\\_1JU1g](http://www.youtube.com/watch?v=R00ZT_1JU1g); <http://video.pbs.org/video/2323758207>);

"Neandertaler – Warum haben wir ihn überlebt?" shown in Germany on 24 and 25 May 2012, and (dubbed) in France, and elsewhere, on the European Arte television channel, produced by the Berlin-based company X-enius AVE Gesellschaft (<http://videos.arte.tv/de/videos/x-enius-7367218.html>; <http://mirror.dokujunkies.org/?r=8281&download=Neandertaler.-.Warum.Haben.Wir.Ihn.überlebt%20.F.GERMAN.DOKU.WS.dTV.SAMPLEFiX.XViD-GEO>) Mirrojunkies is pay-to-view; the last three letters refer to whoever has uploaded the video, and I have chosen GEO though there are many alternative uploaders.

"Arqueomanía: Dossieres sobre Evolución Humana" (especially in parts 1 and 4 of this 4-part series shown on October 6, 113, 20, 27 2013 by TVE (Spanish national television), produced by former government minister Manuel Pimentel's Arqueomanía production company; also in documentary made by the same company "El Paso del Estrecho de Gibraltar" show by TVE on July 28 2013;

"Lo que nos une a los neandertales" shown on TVE (Spanish national television) produced by the Barcelona team of channel "Tres14", June 4, 2011 (<http://www.rtve.es/television/20110921/une-neandertales/463099.shtml>);

"Cueva Negra", an animated educational documentary that gained an award at the Spanish festival of short films at Málaga in 2013, produced by the Murcian regional government's Fundación Integra, with various public showing in the Murcian region in 2012 and 2013 (we have a copy that will be shown during Session 1 at Cueva Negra);

"Piedra sobre piedra", shown on ten occasions via Hispasat (the Spanish government TVE satellite television service to Latin America), made in 2004 by the Madrid production company Cuarto Creciente ([www.cuartocreciente.es/piedra-sobre-piedra](http://www.cuartocreciente.es/piedra-sobre-piedra)) "Neanderthal" is a full-length video and not too appalling – I bought a copy in the UK in February 2001 for thirteen pounds 99 pence at an "HMV" high-street store in London. It was made by the Visual Corporation Ltd in 2000 for television broadcasting in 2001 in the UK via Wall-To-Wall Television Ltd. If the video is still available, you may be able to find out more at <<http://itel.co.uk/neanderthal>>

## YOUR FIELD SCHOOL DIRECTOR, AS SEEN BY HIMSELF

### Michael Walker and his curriculum vitae

#### MY WORK

I was appointed foundation Professor of Physical Anthropology since 1988 at Murcia University, Spain, where I set up the Sub-Department of Physical Anthropology ("Área de Conocimiento de Antropología Física") in the Department of Zoology and Physical Anthropology in the Biology Faculty. I had to teach in Spanish, which I coped with, more or less. I have taught undergraduate course units on both Biological Anthropology and in Human Evolution, as well as postgraduate courses on The Origins of Modern Humans and on Human Ecology, Today and Yesterday, and in addition I supervise graduate students undertaking research, as well as directing research at *Cueva Negra del Estrecho del Río Quípar* and *Sima de las Palomas del Cabezo Gordo*. I have been designated Honorific Emeritus Professor by Murcia University. I ceased to teach formal course units in June 2013 and now my time is taken up with research, the Murcia University research group on "Quaternary Palaeoecology, Palaeoanthropology and Technology" and the Murcian Association for the Study of Palaeoanthropology and the Quaternary (MUPANTQUAT).

#### MY LIFE

I was born at Colchester in England in 1941. This was appropriate for an archaeologist, because, even before Julius Caesar reached England, Colchester was the capital of the prehistoric Celtic King Cunobelinus, or Cymbeline as Shakespeare called him, though English children know him even better from the nursery rhyme as "Old King Cole was a Merry Old Soul... ". King Cunobelinus was almost alone among prehistoric British rulers in being important enough to mint his own coins. A century later, in A.D. 40 the Roman Emperor Caesar Augustus set up the first capital of his new British colony at Colchester, or Camulodunum as it was known in Latin. However, the Celtic Queen Boudicca (or Boadicea) ransacked it, and a new, safer capital was established on the River Thames at London in A.D. 61.

During World War 2, my father was away from home, being an officer in the Royal Air Force, so my mother took me away from German bombs dropping over Colchester, to her family's home in Yorkshire. After his demobilization in 1948, my father, also a Yorkshireman, came back from Germany to join us.

As a boy in Yorkshire, I studied Maths, Physics, Chemistry, Biology, Latin, Greek, French and German at the Bradford Grammar School in Yorkshire, where the great archaeologist Sir Mortimer Wheeler had studied long before me. The composer Delius had been at my school, as had the famous historian Sir Alan Bullock.

My hobbies were archaeology (I founded an Archaeological Society at the school), rowing, squash, mountaineering, spelaeology, hiking and Scouting (I was a Queen's Scout). I kept up several of them for many years afterwards - up to leaving Sydney in 1988, I was in charge of all Venture Scouts in an inner-city Scout District and also helped both on Scout-Leader training-teams and Scout spelaeology training-teams.

I went up to Oxford University to University College (the poet Shelley was expelled from it!) where I took degrees in Animal Physiology (1963) and Medicine and Surgery (1967). I was awarded Oxford University's Near Eastern Archaeological Essay Prize, its Faculty of Medicine's Ophthalmology Prize, and the British Association for the Advancement of Science's Endeavour Prize for a published physiological review of muscular contractility. I spent a while beside the Thames in London's St. Thomas' Hospital Medical School (where Florence Nightingale founded professional nursing after the Crimean War).

While I was in London, I met my future wife, María Teresa Pina Velasco, a Spaniard from Murcia who was working in Bond Street in haute couture. We were married since 1968 until my wife's sad death from cancer in 1998. I have 3 admirable grown-up sons and four grand-children. I live in a flat in Murcia and have a beach-house at La Torre de la Horadada 15 kilometres from *Sima de las Palomas*.

#### MY PROFESSIONAL AND RESEARCH CAREER

In 1968 I took the (first ever) "Distinction" in what was then Oxford University's Postgraduate Diploma in Prehistoric Archaeology (now grandly renamed Master of Studies in Prehistoric Archaeology), studying under the Palaeolithic expert Professor Derek Roe, who published with the late Mary Leakey the monumental 1995 volume on the Olduvai Gorge stone tools, in the Cambridge University Press *Olduvai Gorge* (vol. 5) series of monographs. I then went on to take my DPhil from Oxford for a thesis on the prehistory and physical anthropology of southeast Spain which was supervised by the eminent scholar Professor John Evans who was Director London University's prestigious Institute of Archaeology at that time (now called University College London Institute of Archaeology).

From 1967 to 1969 I was Randall MacIver Research Fellow in Archaeology at The Queen's College at Oxford University. In 1969 I became university lecturer in Human Anatomy at the Edinburgh University Medical School in Scotland. Although I liked Edinburgh and was on full tenure, but I left in 1973 and emigrated to Australia, where I was first university lecturer, again on full tenure, and later senior lecturer, in Anthropology in the Arts Faculty at Sydney University. As well as being a British citizen by birth, I am also an Australian citizen, and for many years ran a part-time general practice in Sydney, especially for Spanish-speaking patients from Spain and South America.

From Sydney, I carried out research in Indonesia and continued to do field-work in southeastern Spain with colleagues at Murcia University. Much of this field-work was financed by Australian Government Research Grants Scheme and or by the National Geographic Society of the USA.. In 1986 the Spanish Government financed me as a Visiting Professor for 12 months in the Department of Anthropology and Genetics in the Science Faculty at Madrid's Autonomous University. While I was there, the Spanish Government brought in a change to the law, in order to enable foreigners to become *tenured* university teachers in Spain, which had been forbidden under General's Franco dictatorship (1939-1975). There had been foreigners before the Spanish Civil War (1936-1939). I was the *first* non-Spaniard to be given a any *permanent Full Professorial-level position* since the Civil War. By a strange quirk of history, the *last* foreigner to hold one had also been a prehistorian, namely, the Austrian scientist Hugo von Obermaier, who left Madrid University after the Spanish Civil War broke out and retired to the Catholic university at Freiburg in Switzerland until his death in 1946.

So, in 1988, I came back to Europe to set up the Sub-Department of Physical Anthropology (Área de Antropología Física) in the Biology Faculty at Murcia University, under a Spanish Government programme ("PROPIO") designed to pump new blood and ideas into collaborating universities. In 1989 I was elected a Fellow of the Society of Antiquaries of London. I returned to Oxford as its official Senior Visiting Research Fellow in Archaeology during 1993 and 1994 from time to time, when I was also Visiting Fellow at St. Cross College. I ran official scientific exchanges, sponsored by the Spanish and British Governments (*Anglo-Spanish Joint Actions HB1992-104B and HB1995-0002B*) together with Derek Roe, Oxford University's Professor of Palaeolithic Archaeology and Director of its Baden-Powell Quaternary Research Centre.

I was also Senior Researcher responsible for the 3-year Spanish Governmental DGICYT Research Project *PB92-0971* and in 1993 was the same for the 1-year Murcia Regional Government Research Project *PSH93-52*, at my two sites of *Cueva Negra* and *Sima de las Palomas*. At the end of 1999, a new Spanish Government *Major Research Grant PB98-0405* was awarded to help with the *Sima de las Palomas* and *Cueva Negra* research in the 3-year period 2000-2001-2002, and a further similar three-year grant was made, *BOS2002-02375*, for the triennium 2003-2004-2006. In 2005 it made available a small grant for 2006 (CGL2005-02410/BTE). In 2007 the Murcian Regional Government's research funding body, *Fundación Séneca*, awarded a grant of 30,000 euros for research at *Cueva Negra* and *Sima de las Palomas* (05584/ARQ/07); the same body awarded me 900 euros in 2006 to present a communication at the XV Congress of the International Union of Prehistoric and Protohistoric Sciences at Lisbon. In 2009 we received a grant of about 25,000 euros for archaeological research at our sites from funds released by the Murcian regional government for archaeological excavations administered by Murcia University. Alas, since 2009 no further public money has been made available for archaeology in Murcia, but our recently formed *Murcian Association for the Study of Palaeoanthropology and the Quaternary, MUPANTQUAT*, and our Field School activities are helping to keep the fieldwork going forward.

The 1999 official recognition by *PB98-045* undoubtedly helped us to acquire new international contacts and collaboration, as well as maintaining pre-existing ones, and most particularly favoured our obtaining the royal patronage of King Juan Carlos I of Spain who graciously accepted Honorary Chairmanship for the (December 6-19, 2000) *International Colloquium and Workshop "The Iberian Peninsula and Human Evolution", A Symposium in Honour of Professor Phillip V. Tobias, F.R.S.* which I organized at Murcia. The late Professor Tobias, who was 75 in 2000, flew to Murcia from South Africa where he was Emeritus Professor of the Witwatersrand University at Johannesburg and directed its Palaeoanthropology Research Group. We had known each other since 1974 and he stayed at my house and visited our Murcian sites.

I directed the scientific content of a travelling European Union-cofunded public exhibition about our sites and research at them, called "**Archaic Europeans and Neanderthals: Project HOMO, Hominins, Technology and Environment in the Middle and early Upper Pleistocene**", which was about our work at *Cueva Negra* and *Sima de las Palomas*, and travelled around the European Union, because it was winner of the European Commission's "Culture 2000" Programme (2000-0820CLTCA1A) so that the Commission paid for half (€150,000 euros) of its cost, the other half coming from the participating institutions that have agreed to display it, namely Murcia's Museo de la Ciencia y del Agua (Science and Water Resources Museum), the Austrian national Museum of Natural History at Vienna (where the exhibition opened in October 2001), the Palaeontological Museum of Barcelona at Sabadell, the Oxford University Museum of Natural History, Logroño Museum, San Sebastián's Science Museum, and other places in Spain.

In February 2000, the Rector (*i.e.* President or Vice-Chancellor) of Murcia University and Mayor of Torre Pacheco signed an agreement to study whether it was feasible to establish a museum and residential field-study centre near Dolores de Pacheco beside *Sima de las Palomas* del Cabezo Gordo. The Torre Pacheco Town Council was enthusiastic about developing the site and its environment and has received from the European Union a modest development grant with a view to preserving the hillside around the site. In February 2007 the Murcian Regional government made available eight million euros, later increased to ten, for building the regional **Museum of Palaeontology and Human Evolution** near Sima de las Palomas in Torre Pacheco municipality and the foundation stone was laid finally in September 2010; building started in 2011 and although the structure was built in 2012 it awaits being fitted out so that the exhibition halls and laboratories can be up and running – with luck in 2017. Meanwhile, in 2016 Torre Pacheco town council has ceded to MUPANTQUAT a spanking new laboratory in its brand-new building that houses both its municipal police department and a library and reading room facility for students, as well as a lecture theatre or meeting room, and we hope to be working in it during our forthcoming 2017 field season at Sima de las Palomas.

My principal academic interests include prehistoric communities, their habitat, and their evolution, with special reference to the palaeoanthropology, prehistoric archaeology and human palaeoecology of the Old World, and in particular the Iberian Peninsula. I am interested in the application to these matters of strategies, methods, and techniques of the natural sciences via investigations into (and attempts to refute) working hypotheses about remains from the past, in endeavours to define appropriate models for its interpretation.

My teaching at both undergraduate and postgraduate levels has reflected those interests: palaeoeconomic and palaeoecological interpretations of human evolution and Quaternary prehistory; human evolution and biological anthropology in their Pleistocene and Holocene environmental setting; Quaternary environmental studies; human and mammalian osteology and osteometry; multivariate statistical analysis; characterization analyses of materials; field programmes of excavation at Pleistocene and Holocene sites. At Murcia University I had to teach in Spanish. I have also published papers in Catalan and French, and can read German and Italian tolerably.

Southeastern Spain is a Mediterranean region with spectacularly abundant palaeoanthropological, palaeoecological, palaeoeconomic, and prehistoric remains from both the Holocene and the Pleistocene. At present I am carrying out fieldwork at two important Murcian sites that straddle the period 250,000-50,000 years ago: *Cueva Negra* and *Sima de las Palomas*. Both provide hominin remains of early *Homo sapiens neanderthalensis*, together with Middle Palaeolithic artifacts and extinct fauna.

Although my own research projects take up most of my time, I have also collaborated with research into Lower Pleistocene hominin remains *Orce*, in Granada, and *Cueva Victoria*, near Cartagena in Murcia, in DGICYT Project PB-91-0044, under the leadership of my dear friend, the late Dr. Josep Gibert. We have presented at the 1995 *International Conference on Human Palaeontology*, held at Orce, a published study, together with other colleagues, of early hominin humeri from the Venta Micena site at Orce; this eventually appeared in the scientific journal *Human Evolution* at the end of 1999. I was on the Scientific Committee of the Conference and gave two papers on my work at *Sima de las Palomas* and *Cueva Negra*, as well as guiding an excursion of international scientists around *Sima de las Palomas*. I also collaborate with a Pleistocene project in the Sierra de Quibas in Murcia, under the leadership of Dr. Miguel Ángel Mancheño, where Late or Middle Pleistocene fauna occurs.

I have also participated in the Murcian Regional Government Project PSH91-31, led by Professor Jorge Eiroa of Murcia University's Prehistory and Archaeology Department, as second principal researcher, undertaking osteological analysis of Copper-Age skeletons from northwestern Murcian sites of *Bagil*, excavated by Professor Eiroa, and *Cueva de los Alcores*. Furthermore, I have collaborated with Murcian Regional Government archaeologist Miguel San Nicolás in other analyses of human skeletons from caves he has excavated, including *Cueva de El Milano* and *Cueva de Pajásola*, and in 1995 we published together a 60-page chapter in a volume edited by the late Dr. Bill Waldren (who also studied under Dr. Roe at Oxford) which is called *Ritual, Rites and Religion in Prehistory* (Oxford: Tempus Reparatum, 1995). At Pajásola a former research student and colleague, Dr. Josefina Zapata did good work, identifying, consolidating and cleaning the hundreds of jumbled human bones, and her doctoral thesis on a major study of a late Roman cemetery population at *Mazarrón* on the southern Murcian coast is in press with *British Archaeological Reports International Series (BAR)*.

When I was at Sydney University I supervised the doctoral theses of Phillip Habgood, who undertook a multivariate statistical analysis of Middle and early Upper Pleistocene hominin skulls which is in press with *British Archaeological Reports International Series (BAR)*, and of American Cheryl Swanson who undertook a similar study on Australian Aboriginal skulls, and I was co-supervisor of Dimitri Anson's thesis which involved characterization studies of Lapita pottery from the Bismarck Archipelago. For over 20 years I was involved in the examination of doctoral candidates at several universities.

In the Biology Faculty at Murcia University a modern, well-equipped Anthropology Research Laboratory and a spacious Teaching Laboratory were equipped, thanks to a special Spanish government grant to complement my appointment as foundation professor, with osteometrical equipment, a Leica MZ-12 "zoom" binocular microscope, a binocular petrographic Zeiss "Jenapol" microscope with photographic accessories, a low-power binocular Olympus microscope with extension arms and photographic accessories, student microscopes, and four microcomputers with digitizer, plotter, printers, scanners, etc., an oven for drying materials, racks and shelving for bone collections, and a growing library of upto date monographs. A Tata 7-seater 4-wheel drive vehicle was acquired in November 2005 by the Physical Anthropology Subdepartment for fieldwork, thanks to a special grant from Murcia University for infrastructure. The Faculty Library has also been expanded with textbooks, monographs and a dozen international journals of Physical Anthropology and Quaternary studies.

Thanks to the generosity of Torre Pacheco town council, with which *MUPANTQUAT* has signed an agreement of collaboration, we can now use a new laboratory that in 2016 has been assigned for Sima de las Palomas research in a spanking new building that houses the municipal police department, a library facility for high-school students, and a large meeting room. We hope to be working in the new lab during our forthcoming 2017 field season at Sima de las Palomas. Our *MUPANTQUAT* association has invested considerable money in acquiring new equipment: a water pump, 12 new geological sieves, a field microscope, a strong safe cabinet for preserving the Sima de las Palomas Neanderthal skeletons, and a compressor and vibroscalpels to clean them with.

Our research enjoys a close relationship with scientists in various Murcia University departments, especially the Prehistory and Archaeology Department, the Department of Analytical Chemistry, the Botany Department, the Department of Geology and Soil Science, and the Veterinary Faculty's Veterinary Hospital CAT scanning unit. Comprising physical anthropologists, archaeologists, geologists and analytical chemists, an official university Research Group on "Quaternary technology, anthropology and ecology" was established at Murcia University, under my direction from 1992 to 2013, which had both local colleagues and external collaborators (officially-recognized as such by Murcia University) who are attached to other institutions (Barcelona University; Cartagena Polytechnic University; Instituto de Patrimonio Histórico of the Murcian regional administration, etc.). This Research Group merged on January 1<sup>st</sup> 2013 with another Murcia University Research Group concerned with palaeopalynology and palaeoenvironmental studies directed by Dr José Carrión García, Professor of Evolutionary Botany. The new entity is called the "Quaternary Palaeoecology, Palaeoanthropology and Technology" Research Group. Dr Carrión is an editor of *Quaternary Science Reviews* and editor-in-chief of the *Review of Paleobotany and Palynology*; he heads the new group officially, though within it the two former groups have each retained de facto autonomy and elect their own separate coordinators for their respective spheres of research interests and activities; Dr María Haber Uriarte who co-directs with me the excavations at *Cueva Negra* and *Sima de las Palomas* is the coordinator of the Palaeoanthropology & Technology section.

I am also interested in developing interpretations of Southeastern Spanish palaeodemography in the Mesolithic, Neolithic, Copper and Early Bronze Ages, which take into consideration palaeoeconomic and palaeoenvironmental aspects of settlement. Reconsideration of the evidence suggests population and settlement densities far below the levels which are inferred by some prehistorians whose monographs have received wide circulation in recent years. Palaeoanthropological findings, as well as archaeological evidence, suggest an extremely sparse population indeed between 8,000 and 4,000 years ago in this region, which many prehistorians have considered as one of prehistoric Europe's dynamic growth regions from a standpoint of cultural evolution. I have written a chapter in Spanish for a volume that I am being prepared about the rock paintings of the Murcian Region which includes a reconsideration of my excavations at the Barranco de los Grajos which I carried out 40 years ago.

#### MEMBERSHIP OF SOCIETIES AND ASSOCIATIONS

Fellowship:

Society of Antiquaries of London

Royal Anthropological Institute of Great Britain  
 Society of Antiquaries of Scotland  
*Emeritus membership:*  
 American Association of Physical Anthropologists  
*Membership:*  
 Prehistoric Society of Great Britain  
 European Society for the Study of Human Evolution  
 Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age (Hugo Obermaier-Gesellschaft für Erforschung des Eiszeitalters und der Steinzeit e.V.)  
 Sociedad Española de Antropología Biológica  
 European Association of Archaeologists  
 European Anthropological Association  
 Asociación Española para el Estudio del Cuaternario  
 British Cave Research Association.  
 Sociedad Española de Paleontología  
 Palaeoanthropology Society  
 Lithics Studies Society  
 Murcian Association for the Study of Palaeoanthropology and the Quaternary  
*Life membership:*  
 Oxford Union Society

## PUBLICATIONS, PRESENTATIONS

### FORTHCOMING

**MS with Oxbow Books editor, Claire Litt, final editorial preparation for publication in 2018**, educational, popular science book: **M.J.Walker** (coordinator): *How the Earliest Cave-Folk of South-East Spain were Dug Up: A journey full of archaeological and anthropological surprises. A book put together by the team excavating under the direction of Michael J. Walker at the sites of Cueva Negra del Estrecho del Río Quípar (the Black Cave of the River Quípar gorge) near Caravaca de la Cruz, Murcia, Spain, and Sima de las Palomas del Cabezo Gordo (Dove Hole on Cabezo Gordo hill) near Torre Pacheco, Murcia, Spain.* (Oxbow Books, Oxford, U.K.).

**MS in final editorial preparation for publication in 2018 by MUPANTQUAT** (Murcian Association for the Study of Palaeoanthropology and the Quaternary), educational, popular science book: **M.J.Walker**, J.García-Torres, M.Haber Uriarte, A.López-Jiménez, M.V.López-Martínez, I.Martín Lerma, J.Ortega-Rodrígáñez, T.Rodríguez-Estrella: *Cómo se excavan los más antiguos yacimientos humanos del sudeste español, un viaje lleno de sorpresas arqueológicas y antropológicas* (Libro compilado por el equipo técnico dirigido por Michael J. Walker de excavación en los yacimientos de la Cueva Negra del Estrecho del Río Quípar en Caravaca de la Cruz, Murcia, España, y la Sima de las Palomas del Cabezo Gordo en Torre Pacheco, Murcia, España).

**MS submitted for publication to Historical Biology:** A.López Jiménez, M. Haber Uriarte, M. López Martínez, **M.J.Walker**, "Small-mammal indicators of biochronology at Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, SE Spain)" (ISSN 15635236).

**MS invited review submitted for publication to Quaternary Science Reviews:** **M.J.Walker**, J.S.Carrón, "Background to Neanderthal presence in Western Mediterranean Europe" (ISSN: 0277-3791).

**MS submitted to Journal of Archaeological Method and Theory,** **M.J.Walker** "Keeping in mind the work in hand. Theorizing about Palaeolithic origins from neuroscientific perspectives on the evolution of human memory."

**MS in preparation for Antiquity:** **M.J.Walker**, M.V.López-Martínez, M.Haber-Uriarte, J.Ortega-Rodrígáñez: "Neanderthal attention to the dead at Sima de las Palomas del Cabezo Gordo (Murcia, Spain)".

## PUBLICATIONS IN PRINT

### A. BOOKS

- 2017: E.Trinkaus (eds) and **M.J.Walker** (eds), *The People of Palomas: Neandertals from the Sima de las Palomas, Cabezo Gordo, Southeastern Spain* (Texas A&M University Press; USA; ISBN 9781623494803).
- 2017 **M.J.Walker**, *Palaeolithic Pioneers, Behaviour, Abilities, and Activity of Early Homo in European Landscapes around the Western Mediterranean Basin ~1.3-0.05 Ma* (Archaeopress, Oxford; ISBN 9781784916206. e-book ISBN 9781784916213).
- 2017 H.M.Manrique, **M.J.Walker**, *Early Evolution of Human Memory: Great Apes, Tool-Making and Cognition* (Palgrave-Macmillan/Springer-Nature, New York, ISBN 9783319644462, e-book ISBN 9783319644479).
- 2013 **M.J.Walker**: Guest Editor, Rethinking Palaeolithic Chronologies in Europe and the Circum-Mediterranean Region, of *Quaternary International* volume 294 part 2 (ISSN-1040-6182)
- 2001 **M.J.Walker**: pp. 1-56 and 116-128; **M.J.Walker**, A.Legaz López, M.López Martínez, pp. 59-115, *Europeos Arcaicos y Neanderthales. Proyecto HOMO, Homínidos, Tecnología y Medio Ambiente en el Pleistoceno Medio y Superior Inicial*. (Exhibition Catalogue). Murcia, Museo de la Ciencia y del Agua del Excmº Aytº de Murcia, 128 pp. (ISBN 848927990X)
- 1999 **M.J.Walker**: Guest Editor of monographic issue devoted to Iberian Peninsula palaeoanthropology of *Human Evolution* volume 14 parts 1-2 (ISSN 0393-9375). Florence, Angelo Pontecorbo Editore, 160 pp.
- 1992 J.Gibert, D.Campillo, E.García-Olivares, A.Malgosa, B.Martínez, P.Palmqvist, F.Sánchez, **M.J.Walker** (eds): *Presencia humana de Granada y Murcia: Proyecto Cueva Victoria-Orce (1988-1992)*. Orce, Ayuntamiento de Orce, Museo de Prehistoria y Paleontología "J.Gibert", (with collaboration from the Caixa de Catalunya and the Excmº Diputació de Barcelona), 503 pp. (depósito legal GR-1277-1992; ISBN 8460444090)
- 1988 **M.J.Walker**: *Ensayo de caracterización de poblaciones del Sureste español, 3.000 a 1.500 a.J.C.* Murcia, Universidad de Murcia, 160 pp. (revised Spanish edition, translated by the author) (ISBN 8476840861)
- 1985 **M.J.Walker**: *Characterising local southeastern Spanish populations of 3,000-1,500 B.C.* Oxford, British Archaeological Reports, "BAR International Series", S-263, 128 pp (ISBN 0860543358)

### B-1 ARTICLES IN SIGNIFICANT JOURNALS (FOR SPANISH JOURNALS, SEE NEXT SECTION B-2)

- Full texts in print. \* pdf available on request.
- \*2016 **M.J.Walker**, D.Anesin, D.E.Angelucci, A.Avilés-Fernández, F.Berna, A.T.Buitrago-López, Y.Fernández-Jalvo, M.Haber-Uriarte, A.López-Jiménez, M.López-Martínez, I.Martín-Lerma, J.Ortega-Rodrígáñez, S.E.Rhodes, D.Richter, T.Rodríguez-Estrella, J-L.Schwenninger, A.R.Skinner: "Combustion at the late Early Pleistocene Palaeolithic site of Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain)". *Antiquity* 90: 571-589 (ISSN: 0003-598X).
  - \*2016 S.E. Rhodes, **M.J.Walker**, A.López-Jiménez, M.López-Martínez, M.Haber-Uriarte, Y.Fernández-Jalvo, M.Chazan, Fire in the Early Palaeolithic: Evidence of small mammal burning at Cueva Negra del Estrecho del Río Quípar, Murcia, Spain, *Journal of Archaeological Science Reports* 9: 427-436 (ISSN 2352409X )
  - \*2016 **M.J.Walker**, D.Anesin, D.E.Angelucci, A.Avilés-Fernández, F.Berna, A.T.Buitrago-López, J.S.Carrón, A.Eastham, S.Fernández-Jiménez, J.García-Torres, M.Haber-Uriarte, A.López-Jiménez, M.V.López-Martínez, I.Martín-Lerma, J.Ortega-Rodrígáñez, I.Polo-Camacho, S.E.Rhodes, D.Richter, T.Rodríguez-Estrella, G.Romero-Sánchez, M.San-Nicolás-del-Toro, J-L.Schwenninger, A.R.Skinner, J.van-der-Made, W.Zack. A view from a cave: Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, southeastern Spain). Reflections on fire, technological diversity, environmental exploitation, and palaeoanthropological approaches. *Human Evolution* 31: 1-67 (ISSN 0393-9375).
  - \*2013 W.Zack, A.Andronikov, T.Rodríguez-Estrella, M.López-Martínez, M.Haber-Uriarte, V.Holliday, D.Lauretta, **M.J.Walker**: "Stone procurement and transport at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Murcia, SE Spain)" *Quartär, Internationales Jahrbuch zur Eiszeitalter- und Steinzeitforschung, International Yearbook for Ice Age and Stone Age Research* 60: 7-28 (ISSN: 0375-7471)

- \*2013 D.Angelucci, D.Anesin, M.López-Martínez, M.Haber-Uriarte, T.Rodríguez-Estrella, **M.J.Walker**: Rethinking stratigraphy and site formation of the Pleistocene deposit at Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Spain). *Quaternary Science Reviews* 89, 195-199 (ISSN: 0277-3791)
- \*2013 D.C.Salazar-García, R.C.Power, A.Sanchis Serra, V.Villaverde, **M.J.Walker**, A.G.Henry: "Neanderthal diets in central and southeastern Mediterranean Iberia" *Quaternary International* 318, 3-18 (ISSN: 1040-6182)
- \*2013 **M.J.Walker**, M.V.López Martínez, J.S.Carrión-García, T.Rodríguez-Estrella, M.San-Nicolás-del-Toro, J-L.Schwenninger, A.López-Jiménez, J.Ortega-Rodríguez, M.Haber-Uriarte, J-L.Polo-Camacho, J.García-Torres, M.Campillo-Boj, A.Avilés-Fernández, W.Zack: "Cueva Negra del Estrecho del Río Quípar (Murcia, Spain): A late Early Pleistocene hominin site with an "Acheulo-Levalloiso-Mousteroid" Palaeolithic assemblage" *Quaternary International* 294: 135-159 (ISSN 1040-6182)
- \*2012 **M.J.Walker**, M.López Martínez, J.Ortega-Rodríguez, M.Haber-Uriarte, A.López-Jiménez, A.Avilés-Fernández, J.L.Polo Camacho, M.Campillo-Boj, J.García-Torres, J.S.Carrión-García, M.San Nicolás-del Toro, T.Rodríguez-Estrella: "The excavation of the buried articulated Neanderthal skeletons at Sima de las Palomas (Murcia, SE Spain)" *Quaternary International* 259: 7-21 (ISSN: 1040-6182)
- \*2011 **M.J.Walker**, J.Ortega, K.Parmová, M.López, E.Trinkaus: "Morphology, body proportions, and postcranial hypertrophy of a female Neandertal from the Sima de las Palomas, southeastern Spain" *Proceedings of the National Academy of Sciences USA* 108 (25): 10087-10091 (ISSN 1091-6490)
- \*2011 **M.J.Walker**, J.Ortega Rodríguez, M.López Martínez, K. Parmová, E. Trinkaus: "Neandertal postcranial remains from the Sima de las Palomas del Cabezo Gordo, Murcia, southeastern Spain," *American Journal of Physical Anthropology* 144: 505-515 (ISSN 0002-9483)
- \*2010 **M.J.Walker**, J.Zapata, A.V.Lombardi, E.Trinkaus, "New evidence of dental pathology in 40,000 year old Neandertals" *Journal of Dental Research* 90: 428-432 (ISSN 0022-0345)
- \*2010 **M.J.Walker**, A.V.Lombardi, J.Zapata, E.Trinkaus: "Neandertal mandibles from the Sima de las Palomas del Cabezo Gordo, Murcia, southeastern Spain" *American Journal of Physical Anthropology* 142: 261-272 (ISSN 0002-9483)
- 2009 **M.J.Walker** "Review of: Lithic technology: measures of production, use and curation, William Andrefsky, Jr., ed, Cambridge University Press, 2008" *The Antiquaries Journal* 89: 427-429 (ISSN: 1938-2367)
- \*2008 **M.J.Walker**, J.Gibert, M.López Martínez, A.V.Lombardi, A.Pérez-Pérez, J.Zapata, J.Ortega, T.Higham, A.Pike, J-L.Schwenninger, J.Zilhão, E.Trinkaus: "Late Neandertals in Southeastern Spain: Sima de las Palomas del Cabezo Gordo, Murcia, Spain" *Proceedings of the National Academy of Sciences USA*, 105 (52): 20631-20636 (ISSN 1091-6490)
- \*2008 J. Gibert, L. Gibert, F. Ribot, C. Ferrández-Canadell, F. Sánchez, A. Iglesias, **M.J. Walker**: "CV-0, an early Pleistocene human phalanx from Cueva Victoria (Cartagena, Spain)" *Journal of Human Evolution* 54: 150-157 (ISSN 0047-2484)
- \*2006 **M.J.Walker**, T.Rodríguez Estrella, J.S.Carrión García, M.A.Mancheño Jiménez, J-L.Schwenninger, M.López Martínez, A.López Jiménez, M.San Nicolás del Toro, M.D.Hills, T.Walking: "Cueva Negra del Estrecho del Río Quípar (Murcia, Southeast Spain): An Acheulian and Levalloiso-Mousteroid assemblage of Palaeolithic artifacts excavated in a Middle Pleistocene faunal context with hominin skeletal remains." *Eurasian Prehistory* 4 (1-2): 3-43, 2006 (Cambridge, Mass., EE.UU., Harvard University, Peabody Museum, American School of Prehistoric Research, ISSN 1730-8518, ISBN 8391641597)
- 2006 ("major review") **M.J.Walker**: "Human evolution, biology, and early European stone age art" *Review of Archaeology* 27: 38-53 (ISSN 1050-4877)
- 2005 ("major review") **M.J.Walker**: "Hominin tar babies, Palaeolithic chewing gum, Middle Pleistocene gloop, and dissipative systems" *Review of Archaeology* 26(1): 1-25 (ISSN 1050-4877)
- 2003 ("major review") **M.J.Walker**: "The quest for our human ancestors" *Review of Archaeology* 24 (1): 20-38 (ISSN 1050-4877)
- \*2003 J.S.Carrión, E.I.Yil, **M.J.Walker**, A.J.Legaz, C.Chain, A.López: "Glacial refugia of temperate, Mediterranean and Ibero-North African flora in south-eastern Spain: new evidence from cave pollen at two Neanderthal man sites." *Global Ecology and Biogeography* 12: 119-129 (ISSN 1466-8238)
- 1999 ("major review") J.S.Carrión, M.Munuera, C.Navarro, F.Burjachs, M.Dupré, **M.J.Walker**: "Palaeoecological potential of pollen records in caves: the case of Mediterranean Spain." *Quaternary Science Reviews* 18 (6): 67-78 (ISSN: 0277-3791)
- 1999 **M.J. Walker**, J.Gibert, F.Sánchez, A.V.Lombardi, I.Serrano, A.Gómez, A.Eastham, F.Ribot, A.Arribas, A.Cuenca, L.Gibert, S.Albaladejo, J.A.Andreu: "Excavations at new sites of early man in Murcia, Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar de la Encarnación" *Human Evolution* 14 (1-2): 99-123 (ISSN 0393-9375)
- 1999 F.Sánchez, J.Gibert, A.Malgosa, F.Ribot, L.Gibert, **M.J.Walker**: "Insights into the evolution of child growth from Lower Pleistocene humeri at Venta Micena (Orce, Granada province, Spain)" *Human Evolution* 14 (1-2): 63-82. (ISSN 0393-9375)
- 1999 J.Gibert, D.Campillo, V.Eisenmann, E.García-Olivares, A.Malgosa, D.A.Roe, **M.J.Walker**, C.Borja, F.Sánchez, F.Ribot, L.Gibert, S.Albadalejo, A.Iglesias, C.Ferrández, E.Maestro: "Spanish late Pliocene and early Pleistocene hominid, palaeolithic and faunal finds from Orce (Granada) and Cueva Victoria (Murcia)" *Human evolution* 14 (1-2): 29-46 (ISSN 0393-9375)
- 1999 J.Gibert, D.Campillo, E.García-Olivares, **M.J.Walker**, C.Ferrández, C.Borja, A.Malgosa, F.Sánchez, F.Ribot, L.Gibert, S.Albadalejo, A.Iglesias, P.Gibert: "Contribution à l'étude des premiers peuplements de l'Europe occidentale: l'apport des recherches sur le Plio-Pliostocène d'Orce et Cueva Victoria (Espagne)" *Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz* 46: 39-62 (ISSN 0076-2741)
- \*1998 **M.J. Walker**, J. Gibert, F. Sánchez, A.V. Lombardi, I. Serrano, A. Eastham, F. Ribot, A. Arribas, A. Cuenca, J-A. Sánchez-Cabeza, J. García-Orellana, L. Gibert, S. Albaladejo, J.A. Andreu: "Two SE Spanish middle palaeolithic remains: Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar (Murcia province)" *Internet Archaeology* issue 5, Autumn/Winter, 1998 [http://intarch.ac.uk/journal/issue5/walker\\_index.html](http://intarch.ac.uk/journal/issue5/walker_index.html) (ISSN 1363-5387)
- 1994 J.Gibert, **M.J.Walker**, A.Malgosa, F.Sánchez, P.J.Pomery, D.Hunter, A.Arribas, A.Maillo: "Hominids in Spain: ice age Neanderthals from Cabezo Gordo" *Research & exploration* 19 (1): 120-123.
- 1992 **M.J.Walker**: "Megaliths and mega-myths" *Review of Archaeology* 13 (1): 11-24 (ISSN 1050-4877)
- 1992 **M.J.Walker**: "Megaliths and mega-myths" *Review of Archaeology* 13 (1): 11-24 (ISSN 1050-4877)
- 1991 D.Rivera Núñez, **M.J.Walker**: "Grape remains and direct radiocarbon dating: a disconcerting experience from El Prado, Murcia, Spain" *Antiquity* 65 (249): 905-908.
- 1989 D.Rivera Núñez, **M.J.Walker**: "A review of palaeobotanical findings of early *Vitis* in the Mediterranean and of the origins of cultivated grape-vines, with special reference to new pointers to prehistoric exploitation in the Western Mediterranean" *Review of Palaeobotany and Palynology* 61: 205-237 (ISSN 0034-6667)
- 1989 **M.J.Walker**: "Turmoil in Spain's universities" *Nature* 340 (6233): 423.
- 1988 T.Murray, **M.J.Walker**: "Like WHAT? A practical question of analogical inference and archaeological meaningfulness" *Journal of Anthropological Archaeology* 7: 248-287 (ISSN 0278-4165)
- 1986 P.Habgood, **M.J.Walker**: "Analyse en composantes principales et classification hiérarchique de crânes du Pléistocène Supérieur" *L'Anthropologie* 90 (3): 555-566 (ISSN 0003-5521).
- 1985 **M.J.Walker**: "El Prado and the southeastern Spanish chalcolithic", *National Geographic Society Research Reports* 20: 799-834 (ISSN 0077-4626)
- 1985 **M.J.Walker**: "The Argaric revised" *Quarterly Review of Archaeology* 6 (4): 3-8 (ISSN 1050-4877)
- 1983 **M.J.Walker**: "Laying a mega-myth: dolmens and drovers in prehistoric SE Spain" *World Archaeology* 15 (1): 37-50 (ISSN 0043-8243)
- 1982 **M.J.Walker**: "CA reply", *Current Anthropology*, 23 (5): 515-516 (ISSN 0011-3204)
- 1982 **M.J.Walker**: "CA reply", *Current Anthropology*, 23 (6): 692-693 (ISSN 0011-3204)
- 1980 A.Cuenca Payá, **M.J.Walker**: "A possible hominid fossil from Alicante, Spain?" *Current Anthropology* 21 (5): 795-800 (ISSN 0011-3204)
- 1979 **M.J.Walker**: "From hunter-gatherers to pastoralists: rock-paintings and neolithic origins in southeastern Spain", *National Geographic Society Research Reports* 11: 511-545 (ISSN 0077-4626)
- 1978 **M.J.Walker**: "Archaeological investigations at El Castillico, near El Sabinar, Murcia, Spain", *National Geographic Society Research Reports* 10: 573-591 (ISSN 0077-4626)
- 1978 J.M.Bowler, E.Stockton, **M.J.Walker**: "Quaternary stratigraphy of the Darling River near Tilpa, N.S.W.", *Transactions of the Royal Society of Victoria* 90 (1-2): 79-88 (ISSN 0035-9211)
- 1977 Santos S., **M.J.Walker**: "Romano-Indian rouletted pottery in Indonesia", *Mankind (Proceedings of the Anthropological Society of New South Wales)* 11: 39-45 (ISSN 1035-0811)
- 1977 Santos S., **M.J.Walker**: "Romano-Indian rouletted pottery in Indonesia", *Asian Perspectives* 20: 228-235 (ISSN 0742-5457)
- 1973 **M.J.Walker**: "Statistics and archaeology, a reply to Johnson", *American Anthropologist* 75: 916-918 (ISSN 0002-7294)
- 1973 **M.J.Walker**: "t-Tests on prehistoric and modern charred grain measurements" *Science and Archaeology* 10: 11-32 (ISSN 0586-9668)
- 1972 **M.J.Walker**: "Cave-dwellers and cave artists of the neothermal period in southeastern Spain" *Transactions of the Cave Research Group of Great Britain* 14: 1-22 (ISSN 0069-1305)
- 1971 **M.J.Walker**: "Spanish Levantine rock art", *Man (Journal of the Royal Anthropological Institute of Great Britain)*, 6 (n.s.): 553-589 (ISSN 1467-9655)
- 1970 **M.J.Walker**: "An analysis of British petroglyphs" *Science and Archaeology* 2-3: 30-62; 4: 26-29 (ISSN 0586-9668)
- 1969 **M.J.Walker**: "The naturalistic animal art of eastern Spain" *Transactions of the Cave Research Group of Great Britain* 11: 121-132 (ISSN 0069-1305)
- 1965 **M.J.Walker**: "The mechanism of muscular contraction" *The Advancement of Science* 21: 132-140 (ISSN. 0001-866X) ("Endeavour" Prize-Winning paper in 1963 of the British Association for the Advancement of Science)

**B-2 ARTICLES: ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS; MINOR ARTICLES OR EARLY ARTICLES IN ENGLISH**  
Full texts in print. \* pdf available on request.

- 2014 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, "The Cueva Negra del Estrecho del Río Quípar: a 0.8 Ma site with human and Palaeolithic remains in SE Spain," *Popular Archaeology* 15 06052014 July 2014 (e-journal, revista electrónica).
- 2014 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, "The Sima de las Palomas del Cabezo Gordo: Neanderthal burials from 50,000 years ago in SE Spain," *Popular Archaeology* 15 06052014 July 2014 (e-journal, revista electrónica).
- \*2011 **M.Walker**, M.López Martínez, M.Haber Uriarte, A.López Jiménez, J.Ortega Rodrígáñez, A.Avilés Fernández, M.Campillo Boj: "Dos yacimientos del Hombre fósil en Murcia: La Cueva Negra del Río Quípar en Caravaca de la Cruz y la Sima de las Palomas del Cabezo Gordo en Torre Pacheco. Segunda Parte. La Sima de las Palomas del Cabezo Gordo" *Acta Científica y Tecnológica* 19: 15-23 (ISSN 1575-7951)
- \*2011 **M.Walker**, M.López Martínez, M.Haber Uriarte, A.López Jiménez, J.Ortega Rodrígáñez, A.Avilés Fernández, M.Campillo Boj: "Dos yacimientos del Hombre fósil en Murcia: La Cueva Negra del Río Quípar en Caravaca de la Cruz y la Sima de las Palomas del Cabezo Gordo en Torre Pacheco. Primera Parte" *Acta Científica y Tecnológica* 18: 14-20 (ISSN 1575-7951)
- \*2011 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, J.Ortega Rodrígáñez: "La Sima de las Palomas del Cabezo Gordo en Torre Pacheco: Excavación e Investigación en 2011" *Verdolay. Revista del Museo Arqueológico de Murcia* 13: 31-41 (special issue: "Actas de los Encuentros sobre Arqueología y Paleontología, Museo Arqueológico de Murcia 21 a 25 noviembre 2011", ISSN: 1130-9776)
- \*2011 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, A.López Jiménez: "La Cueva Negra del Estrecho del Río Quípar en La Encarnación de Caravaca de la Cruz, Murcia, España: Excavación e Investigación en 2011." *Verdolay. Revista del Museo Arqueológico de Murcia* 13: 43-55 (special issue: "Actas de los Encuentros sobre Arqueología y Paleontología, Museo Arqueológico de Murcia 21 a 25 de noviembre de 2011", ISSN: 1130-9776)
- \*2010 (early on-line edition) **M.Walker**, M.López Martínez, M.Haber Uriarte, A.López Jiménez, J.Ortega Rodrígáñez, A. Avilés Fernández, M.Campillo Boj: "Dos yacimientos del Hombre fósil en Murcia: La Cueva Negra del Río Quípar en Caravaca de la Cruz y la Sima de las Palomas del Cabezo Gordo en Torre Pacheco" (Asociación Española de Científicos, Madrid) <http://www.aecientificos.es> then select Artículos de Interés Científico, or go directly to <http://www.aecientificos.es/escaparate/verpagina.cgi?idpagina=20630480&refcompra=> (This on-line versión has colour illustrations, whereas these are in b&w in *Acta Científica y Tecnológica*.)
- 2010 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, A.López Jiménez, J.Ortega Rodrígáñez, K.Parmová, A.Fernández Avilés, M.Campillo Boj: "La Cueva Negra del Estrecho del Río Quípar en Caravaca de la Cruz y la Sima de las Palomas del Cabezo Gordo en Torre Pacheco: Dos ventanas sobre la vida y la muerte del Hombre Fósil en Murcia" *Eubacteria* 24: 2-14 (ISSN1697-0071).
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- 2006 **M.J.Walker**, J.Gibert Clols, M.López Martínez, A.López Jiménez: "La Sima de las Palomas del Cabezo Gordo en Dolores de Pacheco, Torre Pacheco: campaña de 1999", *Memorias de Arqueología* 14: 63-78 (Murcia, Comunidad Autónoma de Murcia, Consejería de Educación y Cultura, Dirección General de Cultura, Servicio de Patrimonio Histórico; ISBN 847564354X)
- 2005 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo en Dolores de Pacheco, Torre Pacheco; campaña de 1998" *Memorias de Arqueología* 13: 11-18 (Murcia, Comunidad Autónoma de Murcia, Consejería de Turismo y Cultura, Dirección General de Cultura, Servicios de Patrimonio Histórico; ISBN 8475642942)
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- 2004 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo (Dolores de Pacheco, Torre Pacheco, Murcia); campaña de 1997" *Memorias de Arqueología* 12: 37-44 (Murcia, Comunidad Autónoma de Murcia, Consejería de Turismo y Cultura, Dirección General de Cultura, Servicios de Patrimonio Histórico; ISBN 8475640559)
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- 2002 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo (Dolores de Pacheco, Torre Pacheco, Murcia); campaña de 1996" *Memorias de Arqueología* 11: 19-33 (Murcia, Comunidad Autónoma de Murcia, Consejería de Turismo y Cultura, Dirección General de Cultura, Servicios de Patrimonio Histórico; depósito legal MU-1.948-2002; ISBN 8475640559)
- 2002 **M.J.Walker**: "La Cueva Negra del Estrecho del Quípar (La Encarnación, Caravaca de la Cruz, Murcia): campaña del 1996" *Memorias de Arqueología* 11: 35-44 (Murcia, Comunidad Autónoma de Murcia, Consejería de Turismo y Cultura, Dirección General de Cultura, Servicios de Patrimonio Histórico; depósito legal MU-1.948-2002; ISBN 8475640559)
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- PRESENTATIONS AT MEETINGS**
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- \*2014 **M.J.Walker**, "Palaeoneurophysiology and cognitive evolution in Pleistocene *Homo*: Biological and palaeoanthropological perspectives on the role of "haptic" working memory in the evolution of long-term procedural memory" at meeting *What Made Us Human*" at Fondazione Ettore Majorana e Centro di Cultura Scientifica, Erice, Italy, October 15-18, 2014 (October 15th, 2014).
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- 2014 **M.J.Walker** (presenter), M.López-Martínez, M.Haner-Uriarte, D.E.Angelucci, D.Anesin, J-L.Schwenninger, F.Berna, S.E.Rhodes, D.Richter, Y.Fernández Jalvo, A.Skinner: "Evidence of fire at the late Early Pleistocene Palaeolithic and hominin site of Cueva Negra del Estrecho del Río Quípar (Caravaca, Murcia, SE Spain)", in XVII Congress of the International Union of Prehistoric and Protohistoric Sciences, Burgos, September 1-7, 2014, at Burgos University, Spain, invited talk in Session B53-The Archaeology of Early Fire Use (September 2<sup>nd</sup>). Publication: In preparation; see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2014)
- 2014 **M.J.Walker** (presenter), M.V.López-Martínez, M.Haber-Uriarte, J.Ortega-Rodríguez (poster\*) "Neanderthal attention to the dead at Sima de las Palomas del Cabezo Gordo (Murcia, Spain)" XVII Congress of the International Union of Prehistoric and Protohistoric Sciences, Burgos, September 1-7, 2014, at Burgos University, Spain, invited poster in Session A21a- Neanderthals On Their Own Terms: New Perspectives For The Study Of Middle Palaeolithic Behaviour (September 5<sup>th</sup>). Publication: In preparation; see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2014) (THE POSTER IS SHOWN IN THIS BRIEFING YOU 2018).
- \*2014 S.E.Rhodes (presenter), **M.J.Walker**, M.López-Martínez, M.Haber-Uriarte y A.López-Jiménez (poster) "Cultivated fire in the Early Paleolithic: evidence of small mammal incidental burning at Cueva Negra, Southeast Spain". International Council on ArchaeoZoology ICAZ meeting held in conjunction with the International Palaeontological Congress, Buenos Aires, August 2014. (THE POSTER IS SHOWN IN THIS BRIEFING YOU 2018).
- 2014 S.E.Rhodes (presenter), **M.J.Walker**, M.López-Martínez, M.Haber-Uriarte, A.López-Jiménez: (poster, A) "Evidence for cultivated fire during the late Early Paleolithic in southeastern Spain: preliminary results from a micromammal taphonomic approach", 23<sup>rd</sup> Annual Meeting of the Palaeoanthropology Society, Calgary, Canada, April 8-9, 2014, held in conjunction with the Annual Meeting of the American Association of Physical Anthropologists.
- 2014 **M.J.Walker** (presenter), W.Zack, A.Andronikov, D.Lauretta, T.Rodríguez-Estrella, M.Lopez Martínez, M.Haber Uriarte and V.Holliday: "Stone procurement and transport at the late Early Pleistocene site of Cueva Negra del Estrecho del Río Quípar (Murcia, SE Spain)", invited lecture, 55<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age 55 Jahrestagung Hugo Obermaier-Gesellschaft für Erforschung des Eiszeitalters und der Steinzeit e.V., April 22-24, 2014, Landesmuseum Braunschweig, Germany. Publication: (FT) B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS (2013).
- 2014 **M.J.Walker**, as "Benjamin Meaker Visiting Professor" at Bristol University gave the following invited presentations in the Bristol University Archaeology and Anthropology Research Seminar Series:
- "Archaeological excavations at Sima de las Palomas del Cabezo Gordo (Murcia, SE Spain) and palaeoanthropological research into its 50,000 year-old Neanderthal remains", Public Lecture, Peet Lecture Theatre, School of Geography, Bristol University, June 6<sup>th</sup>, 2014
  - and an invited Bristol University Institute of Advanced Studies Research Student Seminar on
  - "Cognitive evolution in Pleistocene Homo: Biological and palaeoanthropological perspectives on the role of "haptic" working memory in the evolution of long-term procedural memory", Department of Archaeology, Bristol University June 4<sup>th</sup> 2014.
- 2014 **M.J.Walker** gave the talk "Pre-Neanderthals and Neanderthals: 25 years of research at Cueva Negra del Estrecho del Río Quípar and Sima de las Palomas del Cabezo Gordo (Murcia, Spain)"
- at the invitation of Reading University Archaeology Department on June 9<sup>th</sup> 2014,
  - at the invitation of York University Archaeology Department on June 11<sup>th</sup> 2014,
  - at the invitation of University College Institute of Archaeology on June 12<sup>th</sup> 2014,
  - at the invitation of Oxford University Institute of Archaeology "Quaternary Studies Seminar Series" on June 18<sup>th</sup>, 2014.
- 2014 **M.J.Walker** gave the lecture, at the invitation of the Excmº.Aytº. de Torre Pacheco at its Centro de Artes Escénicas CAES: "¿Cómo era la familia neandertal de la Sima de las Palomas?" on June 22<sup>nd</sup> 2014.
- 2014 S.E.Rhodes (presenter), **M.J.Walker**, M.López-Martínez, M.Haber-Uriarte, A.López-Jiménez: poster "Evidence for cultivated fire during the late Early Paleolithic in southeastern Spain: preliminary results from a micromammal taphonomic approach", 23<sup>rd</sup> Annual Meeting of the Palaeoanthropology Society, Calgary, Canada, April 8-9, 2014, held in conjunction with the Annual Meeting of the American Association of Physical Anthropologists.
- 2014 S.E.Rhodes (presenter), **M.J.Walker**, M.López-Martínez, M.Haber-Uriarte, A.López-Jiménez: poster "Evidence for cultivated fire during the late Early Paleolithic in southeastern Spain: preliminary results from a micromammal taphonomic approach." International Council on ArchaeoZoology ICAZ held in conjunction with the International Palaeontological Congress, Buenos Aires, August 2014.
- 2013 **M.J.Walker** (presenter), J.Ortega Rodríguez, K.Parmová, C.P.E.Zollikofer, M.S.Ponce de León, E.Trinkaus: "The Neanderthal skeletons from Sima de las Palomas, Murcia, SE Spain" April 3<sup>rd</sup> 2013 in 55<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age 55 Jahrestagung Hugo Obermaier-Gesellschaft für Erforschung des Eiszeitalters und der Steinzeit e.V. April 2-6, 2013, at the Naturhistorisches Museum Wien (Vienna, Austria) NP (Unlike the poster, next item, no abstract was published because the invitation to give the talk was made by the President of the Society, barely a month before the meeting, after the poster had been submitted and accepted, and there was not enough time to include an abstract of the talk in the volume of Abstracts which was already with the printers when the invitation was made).
- 2013 **M.J.Walker** (presenter), A.Agut Giménez, M.Soler, C.P.E. Zollikofer, J.Ortega Rodríguez: "The Sima de las Palomas Neanderthal skeletons: First steps towards "virtual" reconstruction", poster\* at 55<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age Jahrestagung Hugo Obermaier-Gesellschaft für Erforschung des Eiszeitalters und der Steinzeit e.V. April 2-6, 2013, at the Naturhistorisches Museum Wien (Vienna, Austria). Publication: poster\* (A): see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2013)
- 2013 D.C.Salazar-García, R.C.Power, A.Sanchis, V.Villaverde, **M.J. Walker**, A.G.Henry: "Integrating multiple lines of Neanderthal dietary evidence. A case study from southeastern Iberia", poster at 3<sup>rd</sup> Annual Meeting of the European Society for the Study of Human Evolution, September 20-22, 2013, at the University of Vienna, Austria. Publication: (A) see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2013)
- 2013 S.E.Rhodes (presenter), **M.J.Walker**, M.López-Martínez, M.Haber-Uriarte, A.T.Buitrago-López, G.Dewar: "Analysis of *Hystrix* specimens recovered from Sima de las Palomas, Murcia, Spain: identification and paleoenvironmental revision", poster\* at the 41<sup>st</sup> Annual Meeting of the Canadian Association for Physical Anthropology, October 17-20 2013, at the Scarborough Campus, University of Toronto, Ontario, Canada. Publication: poster\* (A) see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2013)
- 2013 **M.J.Walker**: "La evolución del cerebro y de la cognición en *Homo*" April 17 2013, invited seminar delivered in the Predepartmental Medical Unit Seminar Series at the Health Sciences Faculty, Universidad Jaume I de Castellón NP
- 2013 **M.J.Walker**: "La familia del Hombre de Neandertal: El hallazgo espectacular de esqueletos en conexión anatómica de niño, mujer y varón de hace 50.000 años en la Sima de las Palomas del Cabezo Gordo en Murcia" March 15 2013 in VIII Jornadas de Formación Para Residentes De Pediatría De La Asociación Española De Pediatría, 13-15 marzo, 2013, Hotel Nelva, Murcia (organized by Asociación Española de Pediatría AEP and Departamento de Pediatría de la Facultad de Medicina de la Universidad de Murcia) NP
- 2013 **M.J.Walker**: "La muerte y el Hombre de Neandertal: La Sima de las Palomas del Cabezo Gordo, un enterramiento hace 50.000 años en Murcia"" March 5 2013 in La Muerte En Las Diferentes Culturas, seminar series at the Hospital Universitario Reina Sofía, Murcia NP

- 2013 **M.J.Walker** "La importancia de la Cueva Negra en la Evolución Humana en Murcia" January 24 2013 in MUPANTQUAT Colloquium accompanying public projection of animated film "Cueva Negra", Museo Arqueológico de Murcia, Murcia (organized by the Murcian Association for the Study of Palaeoanthropology and the Quaternary MUPANTQUAT and Fundación Integra) NP
- 2012 **M.J.Walker** "El fuego hace 800.000 años en la Cueva Negra" December 19 2012, in MUPANTQUAT Colloquium accompanying public projection of animated film "Cueva Negra", Teatro Thuillier Municipal, Caravaca de la Cruz, Murcia (organized by the Murcian Association for the Study of Palaeoanthropology and the Quaternary MUPANTQUAT and Fundación Integra) NP
- 2012 **M.J.Walker** (presenter), J.Ortega Rodrígáñez, A.Agut Giménez, M.Soler Laguía, C.P.E.Zollikofer, M.S.Ponce de León: "The Sima de las Palomas Neanderthal skeletons: First steps towards "virtual" reconstruction", poster\* presented at the 2<sup>nd</sup> Annual Meeting of the European Society for the Study of Human Evolution, September 21-23, 2012, at the Université Montesquieu-Bordeaux IV and Musée d'Aquitaine, Bordeaux (France). Publication: poster\* (A) see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2012)
- 2012 **M.J.Walker**: "Fossil Man in SE Spain: Neanderthals and pre-Neanderthals in Murcia" April 10 2012, in 54<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age 54 Jahrestagung Hugo Obermaier-Gesellschaft für Erforschung des Eiszeitalters und der Steinzeit e.V. Toulouse April 10<sup>th</sup>-14<sup>th</sup>, 2012, at the Muséum d'Histoire Naturelle et Université de Toulouse, Toulouse (France). Publication: (A) see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2012)
- 2012 R.C.Power (presenter), **M.J.Walker**, D.C.Salazar-García, A.G.Henry: "Neandertal plant food consumption and environmental use at Sima de las Palomas, southeastern Iberia" April 11<sup>th</sup> 2012 in 54<sup>th</sup> Annual Meeting of the Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age 54 Jahrestagung Hugo Obermaier-Gesellschaft für Erforschung des Eiszeitalters und der Steinzeit e.V. Toulouse April 10<sup>th</sup>-14<sup>th</sup>, 2012, at the Muséum d'Histoire Naturelle et Université de Toulouse, Toulouse (France). Publication: (A) see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2012)
- 2012 **M.J.Walker**: "Los neandertales y sus ancestros en Murcia" May 8 2012, in El Hombre Y Su Entorno Científico-Cultural, Curso de la Fundación de Estudios Médicos FEM-UMU, Molina de Segura, Murcia NP
- 2012 R.C.Power (presenter), **M.J.Walker**, D.C.Salazar García, A.G.Henry "Neandertal plant food consumption and environmental use at Sima de las Palomas, Southeastern Iberia" poster presented at the Paleoanthropology Society Annual Meeting at Memphis, Tennessee, USA, April 16-17, 2012 NP
- 2011 **M.J.Walker**: "New Neanderthal skeletons and pre-Neanderthal remains from Murcia, S.E. Spain" in official session on Neanderthals In The Iberian Peninsula, June 4 2011, in the XVII Congreso de la Sociedad Española de Antropología Física held at the University of Barcelona, June 2<sup>nd</sup>-5<sup>th</sup> 2011. Publication: (FT\*) see C. CONTRIBUTIONS IN BOOKS OR ACTS OF MEETINGS (2012)
- 2011 **M.J.Walker**: "Nuevos esqueletos de neandertales y restos preneandertales excavados en Murcia: La Sima de las Palomas del Cabezo Gordo y Cueva Negra del Estrecho del Río Quípar", April 28 2011, invited lectura delivered in the Aula Magna de la Sede de la Universidad de Cádiz at Jerez de la Frontera (organized by Ateneo de Jerez and Departamento de Prehistoria, Universidad de Cádiz) NP
- 2011 **M.J.Walker**: "The Sima de las Palomas del Cabezo Gordo and the Cueva Negra del Estrecho del Río Quípar, Murcia, Spain", September 6 2011, in Postgraduate Seminar Series of the Anthropological Institute, University of Zürich, Zürich (Switzerland) NP
- 2011 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, A.López Jiménez: "La Cueva Negra del Estrecho del Río Quípar en La Encarnación de Caravaca de la Cruz, Murcia, España: Excavación e Investigación en 2011" November 21 2011, in Encuentros Sobre Arqueología Y Paleontología, at the Museo Arqueológico de Murcia 21 a 25 de noviembre de 2011 (organized by Consejería de Cultura de la Comunidad Autónoma de la Región de Murcia). Publication: (FT\*) see B. ARTICLES: B-2.ARTICLES IN SPANISH-LANGUAGE JOURNALS etc. (2011)
- 2011 **M.J.Walker**, M.López Martínez, M.Haber Uriarte, J.Ortega Rodrígáñez: "La Sima de las Palomas del Cabezo Gordo en Torre Pacheco: Excavación e Investigación en 2011" November 21 2011, in Encuentros Sobre Arqueología Y Paleontología, at the Museo Arqueológico de Murcia 21 a 25 de noviembre de 2011 (organized by Consejería de Cultura de la Comunidad Autónoma de la Región de Murcia). Publication: (FT\*) see B. ARTICLES: B-2.ARTICLES IN SPANISH-LANGUAGE JOURNALS etc. (2011)
- 2010 **M.J.Walker**, M.López-Martínez, J.S.Carrión-García, T.Rodríguez-Estrella, M.San-Nicolás-del-Toro, J.L.Schwenninger, A.López-Jiménez, J.Ortega-Rodrígáñez, M.Haber-Uriarte, J.L.Polo-Camacho, J.García-Torres, M.Campillo-Boj, A.Avilés-Fernández: "Cueva Negra del Estrecho del Río Quípar (Murcia, Spain): A late Early Pleistocene hominin site with an "Acheulo-Levalloiso-Mousteroid" Palaeolithic assemblage", September 2 2010, in official Regular Session, organized by **M.J.Walker** and T.F.G.Higham, on Rethinking Palaeolithic Chronologies In Europe And The Circum-Mediterranean Region, of the 16<sup>th</sup> Annual Meeting of the European Association of Archaeologists, The Hague, September 1-5 2010 at the Rijkskonservatorium, The Hague. Publication: (FT\*) see: B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS (2013)
- 2009 **M.J.Walker**, M.López Martínez, J.Ortega-Rodrígáñez, M.Haber-Uriarte, A.López-Jiménez, A.Avilés-Fernández, J.LPolo Camacho, M.Campillo-Boj, J.García-Torres, J.S.Carrión-García, M.San Nicolas-del-Toro, T.Rodríguez-Estrella: "The buried late Neanderthal skeletons at Sima de las Palomas (Murcia, SE Spain)" September 18 2009, of the 15th Annual Meeting of the European Association of Archaeologists at Riva del Garda, Trento, Italy, 15-20 September, 2009, in the official Regular Session, organized by L..Longo et al. on Up-dating The Reasoning On Middle To Upper Palaeolithic Biological And Cultural Shift In Eurasia, of the 15th Annual Meeting of the European Association of Archaeologists at Riva del Garda, Trento, Italy, 15-20 September, 2009. Publication: (FT\*) see: B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS (2012)
- 2009 **M.J.Walker**, J.Ortega Rodrigáñez, J.Maki, E.Trinkaus (presenter): "Inferred body proportions of two southern European Neandertals, Palomas 92 and 96" poster\* presented at the 78<sup>th</sup> Congress of the American Association of Physical Anthropologists, Chicago, March 31-April 4, 2009. Publication: poster\* (A) B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS (2010)
- 2009 **M.J.Walker**: "Two decades of field research at the hominin sites in Murcia, Spain, of Cueva Negra del Estrecho del Río Quípar and Sima de las Palomas del Cabezo Gordo" January 15 2009, in January-June 2009 lecture programme of the Society of Antiquaries of London (Burlington House, Piccadilly, London) NP
- 2009 **M.J.Walker**: "La Sima de las Palomas del Cabezo Gordo y la Cueva Negra del Estrecho del Río Quípar", April 24 2009, in Jornadas de Evolución Humana, 200 Aniversario de Charles Darwin 24 y 25 de abril de 2009 at the Centro de Medio Ambiente de la Caja de Ahorros del Mediterráneo, CEMACAM, Tore Gui, Murcia. Publication: (FT\*) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2009)
- 2009 **M.J.Walker**: "Evolución Humana", November 12 2009, in Seminar series Darwin Con Nosotros (October 22 – November 21, 2009) at the Museo de la Ciencia y del Agua, Murcia. Publication: (FT\*) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2010)
- 2009 **M.J.Walker**: "La Sima de las Palomas del Cabezo Gordo y la Cueva Negra del Estrecho del Río Quípar", May 4 2009, in El Paisaje De La Evolución En La Región de Murcia. Homenaje A Darwin En El 200 Aniversario De Su Nacimiento, VI Ciclo de Conferencias del Museo de Siyasa, delivered in the Aula Cultural de la Caja de Ahorros del Mediterráneo, Cieza, Murcia. NP
- 2009 **M.J.Walker**: "La Sima de las Palomas del Cabezo Gordo en Torre Pacheco y la Cueva Negra del Estrecho del Río Quípar en Caravaca de la Cruz: Dos ventanas sobre la vida y la muerte del Hombre Fósil en Murcia", November 16 2009, lecture invited by the División de Antropología Social, Departamento de Economía Agroambiental, IC, EGI y Antropología Social, Universidad Miguel Hernández, delivered in the Aula Magna, Universidad Miguel Hernández, Elche, Alicante NP
- 2008 **M.J.Walker**: "La Sima de las Palomas del Cabezo Gordo y la Cueva Negra del Estrecho del Río Quípar", November 11 2008, one of 5 invited public lectures accompanying the exhibition Secretos Que Esconden Las Rocas., Fósiles En La Región de Murcia, at the Museo Arqueológico de Murcia (October 16th 2008-January 4 2009, organized by the Consejería de Cultura de la Comunidad Autónoma de la Región de Murcia NP
- 2008 **M.J.Walker**; "El Hombre de Neanderthal de la Sima de las Palomas en el Cabezo Gordo" May 21 2008 in I Seminario Mar Menor Y Espacios Naturales De Su Entorno, 20 al 25 de mayo de 2008, organized by Fundación Clúster para la Protección y Conservación del Mar Menor, de la Comunidad Autónoma de la Región de Murcia, delivered in the Aula Cultural de CajaMurcia, San Pedro del Pinatar, Murcia NP
- 2008 **M.J.Walker**: "Conferencia inaugural: Los yacimientos neandertalenses de la Sima de las Palomas y Cueva Negra", November 7 2008 in Segundo Curso de Paleontología Humana Y Geología Del Cuaternario, La Llegada Del Hombre A Europa, Homenaje Al Dr. José Gibert, El Registro Paleontológico, Geológico Y Arqueológico De La Cuenca De Guadix-Baza. 7,8 y 9 de noviembre de 2008, organized by Ayuntamiento de Orce and Fundación Josep Gibert, delivered in the Palacio de los Segura, Orce, Granada NP
- 2007 **M.J.Walker**: "Field research at Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar, Murcia, Spain" April 18 2007 in Max-Planck Institut für Evolutionäre Anthropologie Seminars, Max-Planck Institut für Evolutionäre Anthropologie, Leipzig, Germany NP
- 2006 **M.J.Walker**: "The demise of the 'Mysteries': Cognitive ability of mid-Middle Pleistocene hominins at the Lower-to-Middle Palaeolithic transition in western Europe" September 8<sup>th</sup> 2006 in XV Congress of the International Union for Prehistoric and Protohistoric Sciences Global State of the Art, Lisbon, 4-9 September 2006, Colloquium 13 The Earliest Inhabitants In Europe, held at the University of Lisbon, Lisbon, Portugal. Publications: (FT\*) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. 2009 (de Beaune et al; 2006); also (A) see C. CONTRIBUTIONS (2006)
- 2006 **M.J.Walker**: "La evolución singular del ciclo vital del género *Homo*" September 19 2006 in El Reloj Biológico del Envejecimiento, Universidad Internacional del Mar de la Universidad de Murcia September 18-22 2006, held at Centro de Recursos y Profesores, San Pedro del Pinatar, Murcia NP

- 2006 **M.J.Walker**: "El arte rupestre prehistórico, la evolución climática en el Holoceno, y los cambios culturales: Una perspectiva desde Murcia" July 24th 2006 in Sueños, Sentimientos y Emociones Del Hombre A Través De Sus Manifestaciones Artísticas Y Rupestres, Universidad Internacional del Mar de la Universidad de Murcia July 24-28 2006, held at Centro Regional de Interpretación de Arte Rupestre, Moratalla, Murcia. Publication: (FT\*) page proofs corrected and returned, in press
- 2006 **M.J.Walker**: ""Hombre de Flores y Hombre de Neanderthal: Nuestros últimos 'primos hermanos' fósiles"" February 17 2006 in Jornadas de Geología, organized by Diputación de Castellón and Generalitat de Valencia Conselleria de Educació, delivered at Planetario de Castellón, Castellón de la Plana NP
- 2006 **M.J.Walker**: "Investigaciones paleoantropológicas en la Cueva Negra del Estrecho del Río Quípar y la Sima de las Palomas del Cabezo Gordo, Murcia: Dos estaciones del Pleistoceno Medio y Superior antiguo con restos de homínidos y del Paleolítico" February 20 2006 in Seminar Series of Departamento de Antropología Física de la Universidad de Barcelona, Facultad de Biología, Universidad de Barcelona, Barcelona NP
- 2005 **M.J.Walker**: "Excavations at the early Middle Pleistocene site of Cueva Negra del Estrecho del Río Quípar and the early Upper Pleistocene site of Sima de las Palomas del Cabezo Gordo, in Murcia, Spain: Two sites with hominin and Palaeolithic remains" November 17 2005 in Oxford University Institute of Archaeology "Quaternary Seminar Series", Oxford University Institute of Archaeology, Oxford NP
- 2005 **M.J.Walker**, M.López Martínez: "La Cueva Negra del Estrecho del Quípar (La Encarnación, Caravaca de la Cruz, Murcia: campaña de 2004" in XVI Jornadas de Patrimonio Histórico. Intervenciones en el Patrimonio Arquitectónico, Arqueológico y Etnográfico de la Región de Murcia October 17-27 2005, held at ETS Ingeniería Agronómica, Universidad Politécnica de Cartagena, Campus Alfonso XIII, Cartagena, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2005)
- 2005 **M.J.Walker**, J.Gibert Clols: "Resultados principales de la excavación arqueológica de 2004 en la Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia)" in XVI Jornadas de Patrimonio Histórico. Intervenciones en el Patrimonio Arquitectónico, Arqueológico y Etnográfico de la Región de Murcia October 17-27 2005, held at ETS Ingeniería Agronómica, Universidad Politécnica de Cartagena, Campus Alfonso XIII, Cartagena, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2005)
- 2005 **M.J.Walker**: "Hombre de Flores y Hombre de Neanderthal: Nuestros últimos 'primos hermanos' fósiles" March 8 2005, invited lecture in Conferencias de Antropología, organized for Fundación CajaMurcia chaired by Prof.J.Lorite of Murcia University, delivered in the Aula Cultural de CajaMurcia, Murcia NP
- 2004 **M.J.Walker**: "El Hombre de Neanderthal en Murcia, La Sima de las Palomas y la Cueva Negra" March 29th 2004 in Seminario Público sobre "Neandertales" organized by Prof.J.Lomba of Murcia University, held at Facultad de Letras, Universidad de Murcia, Murcia NP
- 2004 **M.J.Walker**: "El Hombre de Neanderthal en Murcia" April 2004, lecture invited by Círculo de Profesores de Lorca, Instituto de Bachillerato Mixto 1 "J.Ibáñez Martín", Lorca, Murcia NP
- 2004 **M.J.Walker**, J.Gibert Clols, M.López Martínez: "Actuaciones en yacimientos del Paleolítico Medio durante 2003: La Cueva Negra del Estrecho del Río Quípar y la Sima de las Palomas del Cabezo Gordo" in XV Jornadas de Patrimonio Histórico y Arqueología de la Región de Murcia November 24-Dec.2 2004, Museo Arqueológico de Murcia, Murcia Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (2004)
- 2003 **M.J.Walker**: "El Hombre de Neanderthal en Murcia/Neanderthal gizakia Murtzian" October 28 2003, inaugural invited lecture for the Exhibition "Europeos Arcaicos Y Neandethales/Europar Arkaikoak Eta Neanderthalak" at Miramon Kutxa Espacio de la Ciencia/Miramont Zientziaren Kutxagunea-Museo de la Ciencia de la Caja de Ahorros de Guipúzcoa, San Sebastián/Donostia NP
- 2003 **M.J.Walker**, M.López Martínez: "La Cueva Negra del Estrecho del Quípar (La Encarnación, Caravaca de la Cruz, Murcia): campaña de excavaciones y avance de investigaciones en 2002" in XIV Jornadas de Patrimonio Histórico y Arqueología de la Región de Murcia November 17-21 2003, at Colegio Oficial de Arquitectos, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2003)
- 2003 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo (Dolores de Pacheco, Torre Pacheco, Murcia): campaña de excavaciones y avance de investigaciones en 2002" in XIV Jornadas de Patrimonio Histórico y Arqueología de la Región de Murcia November 17-21 2003, at Colegio Oficial de Arquitectos, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2003)
- 2002 **M.J.Walker**: "El 'Problema Neanderthal' y la Genética de la Evolución Humana", February 22 2002, in lecture series accompanying the exhibition "Proyecto HOMO: Homínidos, Tecnología Y Medio Ambiente En El Pleistoceno Medio Y Superior Inicial" at Museo de la Ciencia y del Agua, Murcia. **M.J.Walker**: "El 'Problema Neanderthal' y la Genética de la Evolución Humana" NP
- 2002 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo (Dolores de Pacheco, Torre Pacheco, Murcia): campaña del 2001" in XIII Jornadas de Patrimonio Histórico y Arqueología Regional November 5-8 2002 at Centro Cultural "Las Claras" de CajaMurcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2002)
- 2002 **M.J.Walker**, M.López Martínez, "La Cueva Negra del Estrecho del Quípar (La Encarnación, Caravaca de la Cruz, Murcia): campaña del 2001" in XIII Jornadas de Patrimonio Histórico y Arqueología Regional November 5-8 2002, at Centro Cultural "Las Claras" de CajaMurcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2002)
- 2001 **M.J.Walker**: "Neanderthals and Pre-Neanderthals in Southern Iberia", November 13 2001, in Seminar Series of Oxford University Department of Biological Anthroplogy and Oxford University School of Archaeology, delivered at the "Pauling Centre for the Human Sciences", Oxford University NP
- 2001 **M.J.Walker**: "Excavations and Palaeoanthropological Research at Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Rio Quípar (Murcia, South-East Spain)", October 23<sup>rd</sup> 2001, inaugural lecture accompanying the Exhibition Älterer Europäer Und Neandertaler, Projekt MENSCH. Mensch, Technologie Und Umwelt In Der Jüngeren Eiszeit, at the Naturhistorischesmuseum Wien (Vienna, Austria) NP
- 2001 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo (Dolores de Pacheco, Torre Pacheco, Murcia): campaña del 2000" in XII Jornadas de Patrimonio Histórico y Arqueología Regional, May 22-25 2001 at Centro Cultural "Las Claras" de CajaMurcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2001)
- 2001 **M.J.Walker**, J.I.Serrano Izquierdo: "La Cueva Negra del Estrecho del Quípar (La Encarnación, Caravaca de la Cruz, Murcia): campaña del 2000" in XII Jornadas de Patrimonio Histórico y Arqueología Regional, May 22-25 2001 at Centro Cultural "Las Claras" de CajaMurcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2001)
- 2001 **M.J.Walker**: "Neanderthals and their landscapes: Aspects of research at Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar in the context of middle palaeolithic and Neanderthal sites in the Segura drainage basin and adjacent areas of SE Spain" in XIV Congress of the International Union of Prehistoric and Protohistoric Sciences September 2-8 2001 Colloquium of Commission 27, at the Université de Liège, Liège. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2004, N.J.Conard, ed, *Settlement Dynamics...*)
- 2001 **M.J.Walker**: "Two Neanderthal Man sites from Murcia, S.E. Spain" in XIV Congress of the International Union of Prehistoric and Protohistoric Sciences September 2-8 2001 General Session On Human Origins And The Lower Palaeolithic, at the Université de Liège, Liège. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2004, M.Toussaint et al, eds, *Premiers Hommes...*)
- 2001 **M.J.Walker**: "Sobre la coevolución de la morfología, la paleoetología humana, del lenguaje y de la conciencia humana durante el Pleistoceno" in XIV Reunión Bienal de la Real Sociedad Española de Historia Natural, September 18-21 2001, at the University of Murcia, Murcia. NP
- 2001 **M.J.Walker**, A.Legaz López, "Estudio de micromamíferos del Pleistoceno de Cueva Negra (Caravaca de la Cruz, Murcia)" in XIV Reunión Bienal de la Real Sociedad Española de Historia Natural, September 18-21 2001, at the University of Murcia, Murcia. NP
- 2000 **M.J.Walker**: "El Hombre de Neanderthal en Murcia: La Cueva Negra del Estrecho del Quípar y la Sima de las Palomas del Cabezo Gordo" in Coloquio-Taller Internacional: La Península Ibérica Y La Evolución Humana. Un Simposio En Honor Del Prof. Dr. Phillip V. Tobias, F.R.S., Murcia, December 6-10 2000, at the University of Murcia, Murcia NP
- 2000 **M.J.Walker**: poster presentation "The Search for Neanderthals" (Earthwatch Institute field research project), April 15-16 2000, Earthwatch Millennium Conference at Oxford University Examination Schools, Oxford NP
- 2000 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo, Torre Pacheco: Campaña de 1.999" in XI Jornadas de Arqueología Regional (Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2006); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2000)
- 2000 **M.J.Walker**, J.I.Serrano Izquierdo: "La Cueva Negra del Estrecho de La Encarnación, Caravaca de la Cruz, Murcia): Campaña de 1.999" in XI Jornadas de Arqueología Regional, held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2006); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (2000)
- 1999 **M.J.Walker**, J.I.Serrano Izquierdo: "La Cueva Negra del Estrecho de La Encarnación, Caravaca de la Cruz, Murcia): Campaña de 1.998" in X Jornadas de Arqueología Regional May 11-14 1999, held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia) Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2005); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999)

- 1999 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo, Torre Pacheco: Campaña de 1.998" in X Jornadas de Arqueología Regional May 11-14 1999 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2005); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999)
- 1998 **M.J.Walker**, J.I.Serrano Izquierdo: "La Cueva Negra del Estrecho de La Encarnación, Caravaca de la Cruz, Murcia): Campaña de 1.997" in IX Jornadas de Arqueología Regional May 5-8 1998 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publication: (FT) see ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2004)
- 1998 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo, Torre Pacheco: Campaña de 1.997" in IX Jornadas de Arqueología Regional May 5-8 1998 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publication: (FT) see ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2004)
- 1997 **M.J.Walker**, J.Gibert Clols: "Dos yacimientos murcianos con restos neandertalenses: La Sima de las Palomas del Cabezo Gordo y la Cueva Negra del Estrecho del Quípar de La Encarnación" in XXIX Congreso Nacional de Arqueología, Cartagena, October 28-31 1997 held at the Museo Arqueológico Municipal, Cartagena and Universidad Politécnica de Cartagena. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999)
- 1997 **M.J.Walker**: "The Search for Neanderthals" poster presentation at Earthwatch Institute Conference, September 1997, Harvard University Science Center, Cambridge, Mass., USA
- 1997 **M.J.Walker**: "La Cueva Negra del Estrecho de La Encarnación, Caravaca de la Cruz, Murcia): Campaña de 1.996" in VIII Jornadas de Arqueología Regional May 13-16 1997 held at the Museo Arqueológico Municipal "Ementerio Cuadrado", Mula, and Colegio Oficial de Arquitectos, Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2002)
- 1997 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo, Torre Pacheco: Campaña de 1.996" in VIII Jornadas de Arqueología Regional May 13-16 1997 held at the Museo Arqueológico Municipal "Ementerio Cuadrado", Mula, and Colegio Oficial de Arquitectos, Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2002)
- 1996 **M.J.Walker**: "Two new Neanderthal sites in S.E. Spain: Sima de las Palomas and Cueva Negra de La Encarnación" in Oxford University "Donald Baden Powell" Quaternary Research Centre Seminar Series, November 20 1996, at Oxford University "Donald Baden Powell" Quaternary Research Centre NP
- 1996 **M.J.Walker**: "El problema del Neanderthal y del hombre moderno" in La Evolución Humana Y La Paleoantropología, September 23 -27 1996, Universidad del Mar de la Universidad de Murcia, held at Dolores de Pacheco, Murcia. NP
- 1996 **M.J.Walker**: "El problema del Neanderthal y del hombre moderno" in La Evolución Humana Y La Paleoantropología, September 23 -27 1996, Universidad del Mar de la Universidad de Murcia, held at Dolores de Pacheco, Murcia. NP
- 1996 **M.J.Walker**: "Los homínidos del Pleistoceno Medio de Java" in La Evolución Humana Y La Paleoantropología, September 23 -27 1996, Universidad del Mar de la Universidad de Murcia, held at Dolores de Pacheco, Murcia. NP
- 1996 **M.J.Walker**: "Dos estaciones murcianas con restos neandertalenses: la Sima de las Palomas del Cabezo Gordo y la Cueva Negra del Estrecho del río Quípar de La Encarnación" in La Evolución Humana Y La Paleoantropología, September 23 -27 1996, Universidad del Mar de la Universidad de Murcia, held at Dolores de Pacheco, Murcia. NP
- 1996 **M.J.Walker**: "En búsqueda del hombre fósil: Los yacimientos del hombre de Neanderthal de la Sima de las Palomas del Cabezo Gordo y la Cueva Negra de La Encarnación" in Semana Cultural de Cartagena, September 18 1996, Lecture series held at the Centro Cultural del Excmº Ayuntamiento de Cartagena, Cartagena, Murcia. NP
- 1996 **M.J.Walker**: "Ex Africa semper aliquid novum" in La Evolución Humana, Homenaje al Profesor Phillip V. Tobias, F.R.S., May 6-8 1996, at the International Symposium held at the Universidad de las Islas Baleares, Palma de Mallorca, Spain. NP
- 1996 **M.J.Walker**: "La Cueva Negra del Estrecho de La Encarnación, Caravaca de la Cruz, Murcia): Campaña de 1.995" in VII Jornadas de Arqueología Regional May 14-17 1996 held at the Museo Arqueológico Municipal, Lorca, and Colegio Oficial de Arquitectos, Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2002)
- 1996 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo, Torre Pacheco: Campaña de 1.995" in VII Jornadas de Arqueología Regional May 14-17 1996 held at the Museo Arqueológico Municipal, Lorca, and Colegio Oficial de Arquitectos, Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (2002)
- 1996 **M.J.Walker**: "The Search for Neanderthals" in Earthwatch Europe Conference, 1996 held at the Oxford University Museum of Natural History, Oxford. NP
- 1995 **M.J.Walker**, J.Gibert Clols: "New finds of hominids and Mousterian tools at the Murcian sites of Sima de las Palomas del Cabezo Gordo and Cueva Negra de La Encarnación" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999); see also (A) C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1995 **M.J.Walker**, J.Gibert, F.Sánchez, A.V.Lombardi, I.Serrano, A.Gómez, F.Ribot, L.Gibert (presenter), A.Cuenca, S.Albadalejo, J.A.Andreu: "Sedimentologic study of Sima de las Palomas del Cabezo Gordo and Cueva Negra del Estrecho del Río Quípar de La Encarnación (Murcia, Spain): Two hominid sites from the Middle and Upper Pleistocene" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999)
- 1995 J.A.Pérez-Claros, P.Palmqvist (presenter), J.Gibert, B.Martínez, **M.J.Walker**: "Morphometric study of a human diaphysis from Orce, by means of canonical discriminant functions of Fourier series harmonic descriptors of diaphyseal cross-sectional outlines" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1995 **M.J.Walker**, J.I.Serrano: "Sima de las Palomas: the artefacts" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1995 **M.J.Walker**, J.Gibert, F.Ribot (presenter): "Estudio del temporal humano, CG-12, del yacimiento del Cabezo Gordo, Murcia (España)" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1995)
- 1995 **M.J.Walker**, J.Gibert, L.Gibert S.Albaladejo, F.Plana: "Geología de la Sima de las Palomas del Cabezo Gordo (Murcia)" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1995)
- 1995 F.Sánchez, **M.J.Walker**, J.Gibert: in "Las maníbulas del Cabezo Gordo (Murcia)" International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999); see also (A) C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1995 **M.J.Walker**: "New middle and upper palaeolithiuc finds from Orce, Granada, Spain" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. J.L.Santamaría, A.Bouquet, C.Aller, P.García-Prieto, Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1995)
- 1995 J.Gibert (presenter), A.Malgosa, F.Sánchez, F.Ribot, **M.J.Walker**: "Humeral fragments attributable to *Homo* sp. from Lower Pleistocene sites at Venta Micena (Orce, Spain)" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada, September 4-8 1995 (Palacio de los Segura, Orce, Granada) Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1999)
- 1995 **M.J.Walker**, A.Gómez, I.Serrano, "New Neanderthal finds from Murcia: Cueva Negra del Estrecho de La Encarnación" in International Congress Of Human Palaeontology: Hominids And Their Environment In The European Middle Pleistocene, Orce, Granada, September 4-8 1995 held at the Palacio de los Segura, Orce, Granada. Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1995)
- 1995 **M.J.Walker**: "La disposición de los muertos y la dispersión de los muertos en el Sureste preargárico" in La Arqueología De La Muerte, September 16 1995, Universidad del Mar de la Universidad de Murcia held at the Aula de Cultura, Torre Pacheco, Murcia. NP
- 1995 **M.J.Walker**, J.I.Serrano Izquierdo, A.Gómez Domíngues: "El hombre de Neanderthal de la Cueva Negra de La Encarnación", Public Lecture invited by Excmº Ayuntamiento de Caravaca de la Cruz, October 5 1995 held at the Casa de Cultura, Caravaca de la Cruz, Murcia. NP
- 1995 **M.J.Walker**: "Nuevos restos de homínidos del Pleistoceno de Murcia" in Seminar Series of la Unitat d'Antropològia de la Facultat de Ciències de la Universitat Autònoma de Barcelona, April 26 1995 held at the Facultat de Ciències, Universitat Autònoma de Barcelona, Barcelona. NP
- 1995 **M.J.Walker**: "Nuevos restos de homínidos de la Sima de las Palomas y la Cueva Negra (Murcia)" in Seminar Series del Departament d'Antropològia de la Facultat de Biologia de la Universitat de Barcelona, April 27 1995 held at the Facultat de Biologia, Universitat de Barcelona, Barcelona. NP

- 1995 **M.J.Walker**, J.Gibert Clols: "La Sima de las Palomas del Cabezo Gordo, Torre Pacheco: Campaña de 1.994" in VI Jornadas de Arqueología Regional April 24-27 1995 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1999); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1995 **M.J.Walker**, A.Gómez Domínguez: "La Cueva Negra del Estrecho de La Encarnación, Caravaca de la Cruz, Murcia): Campaña de 1.994" in VI Jornadas de Arqueología Regional April 24-27 1995 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1999); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1995 **M.J.Walker**: "El hombre fósil en Murcia: El yacimiento de la Sima de las Palomas del Cabezo Gordo" Public lecture invited by Excmº. Ayuntamiento de Torre Pacheco, March 6 1995 held at the Aula de Cultura, Torre Pacheco, Murcia. NP
- 1994 **M.J.Walker**: "In search of the Neanderthals" in Global Networks, Closing The Knowledge Gap, Earthwatch Annual Conference, October 6-8 1994 held at the American Academy of Arts and Sciences, Cambridge, Massachusetts, USA. NP
- 1994 **M.J.Walker**, J.Gibert Clols: "Sima de las Palomas and Cueva Negra: New hominid finds from Murcia, SE Spain" in Joint Seminar Series on Human Origins of the University of Liverpool Department of Anatomy and Department of Archaeology, November 17 1994 held at the Department of Anatomy, University of Liverpool. NP
- 1994 **M.J.Walker**, J.Gibert Clols: "New hominid finds from SE Spain" in Seminar Series of the Institute of Archaeology, University College London, November 15 1994 held at the Institute of Archaeology, University College London. NP
- 1994 **M.J.Walker**, J.Gibert Clols: "Cabezo Gordo and Cueva Negra: New Neanderthal and pre-Neanderthal finds from SE Spain" in Department of Palaeontology Seminar Series of The Natural History Museum, November 15 1994 (The Natural History Museum, London) NP
- 1994 **M.J.Walker**: "New hominid finds from Cabezo Gordo and Cueva Negra, Murcia, S.E. Spain" in Oxford University Donald Baden-Powell Quaternary Research Centre Seminar Series, October 17 1994 held at the Oxford University Donald Baden-Powell Quaternary Research Centre, Oxford. NP
- 1994 **M.J.Walker**: "Middle and Upper Pleistocene Hominids in SE Spain: Cabezo Gordo and Cueva Negra" in Oxford University Department of Biological Anthropology Seminar Series, October 31 1994 (Oxford University Department of Biological Anthropology, Oxford) NP
- 1994 **M.J.Walker**, J.Gibert Clols: "In search of Neanderthals in S.E. Spanish caves" a Public Lecture at St. Anne's College, University of Oxford, sponsored by Earthwatch Europe and the Oxford University Cave Club, November 16 1994, delivered at St. Anne's College, Oxford. NP
- 1994 A.Cuenca Payá (presenter), **M.J.Walker**: "Terrazas fluviales en la zona bética de la Comunidad Valenciana" in El Cuaternario Del País Valenciano (organized by Asociación Española para el Estudio del Cuaternario) October 1994 held at the Universidad de Valencia, Valencia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1994 **M.J.Walker**: "Cueva Negra del Estrecho de La Encarnación (Caravaca de la Cruz, Murcia): campaña de 1993" in V Jornadas de Arqueología Regional, May 10-12 1994 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1999); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1994)
- 1994 J.Gibert Clols, **M.J.Walker**: "Cabezo Gordo (Balsicas, Torre Pacheco, Murcia): campaña de 1993" in V Jornadas de Arqueología Regional, May 10-12 1994 held at the Dirección General de Cultura, Consejería de Cultura y Educación de la Comunidad Autónoma de la Región de Murcia, Murcia. Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1999); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1994)
- 1993 **M.J.Walker**: "Neolithic Spain was pre-Indo-European: radiocarbon distribution maps give the lie to neolithic 'Indo-European colonists'" in Anthropology And Genetics, August 23-27 1993 held at the Centro de El Escorial de los Cursos de Verano de la Universidad Complutense de Madrid. NP
- 1993 **M.J.Walker**, M.San Nicolás del Toro: "Disposal of the dead and dispersal of the living in pre-Argaric S.E. Spain. Abrigo 2 de El Milano and a revision of the dynamics of cultural change: 'Little Big Men' and No Growth in population?" in Ritual, Rites And Religion In Prehistory, IIIrd Deià International Conference Of Prehistory, September 25-30 1993 held at the Deià Archaeological Museum and Research Centre, Deià, Mallorca. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1995)
- 1993 **M.J.Walker**: "Nuevos datos sobre el musterense y Pleistoceno Superior en la Región de Murcia" in Simposio Projecte Orce-Cova Victoria i Cabezo Gordo, May 19 1993 (at Universitat Autònoma de Barcelona, Bellaterra, Barcelona and Parc Tecnològic, Cerdanya, Barcelona) NP
- 1993 **M.J.Walker**, J.Zapata Crespo: "Salud y enfermedad en época romana: la necrópolis del Puerto de Mazarrón, Murcia" in II Congreso Nacional de Paleopatología, October 7-10, 1993 held at the Facultad de Medicina, Universidad de Valencia, Valencia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1996)
- 1993 **M.J.Walker**: "El desarrollo de la Paleopatología en la Comunidad Autónoma de la Región de Murcia" (invited contribution to a Round Table on The State of Palaeopathological Research in Spain) in II Congreso Nacional de Paleopatología, October 7-10, 1993 held at the Facultad de Medicina, Universidad de Valencia, Valencia. NP
- 1992 **M.J.Walker**: "A fossilized human incisor from Cueva Negra (Caravaca, Murcia, Spain)" in Third International Congress of Human Palaeontology, Jerusalem, August 29-September 5 1992 held at the Hebrew University, Jerusalem. NP
- 1992 F.Sánchez, J.Gibert, A.Malgosa, **M.J.Walker**, with A.Arribas: "Mousterian hominid remains from Cabezo Gordo (Torre Pacheco, Murcia, Spain)" in Third International Congress of Human Palaeontology, Jerusalem, August 29-September 5 1992 held at the Hebrew University, Jerusalem. NP
- 1992 J.Gibert, **M.J.Walker**: "New hominid remains and Mousterian artefacts from Murcia, S.E. Spain: Cabezo Gordo (Torre Pacheco) and Cueva Negra de La Encarnación (Caravaca)" in Symposium On The Mitochondrial Debate And The Origin Of Modern Humans, September 23-25 1992 held at the International Institute for the Study of Man, Cortona, Italy. NP
- 1992 J.Gibert Clols, **M.J.Walker**: "Hominid remains from the Middle Palaeolithic sites at Cabezo Gordo (Torre Pacheco, Murcia, Spain) and Cueva Negra de La Encarnación (Caravaca, Murcia, Spain)" in Eighth Congress of the European Anthropological Association, September 6-10 1992 (at Universidad Complutense, Madrid) NP
- 1992 **M.J.Walker**, J.Zapata Crespo: "Life and death in Roman Spain: the cemetery series from Puerto de Mazarrón, Murcia" in Eighth Congress of the European Anthropological Association, September 6-10 1992 held at the Universidad Complutense, Madrid. NP
- 1992 J.Gibert Clols (presenter), P.Palmqvist, F.Sánchez, **M.J.Walker**, J.L.Santamaría, B.Martínez, F.Ribot: "The human remains from the Orce and Cueva Victoria sites" in Eighth Congress of the European Anthropological Association, September 6-10 1992 held at the Universidad Complutense, Madrid. NP
- 1992 Primer Simposio Del Poblamiento Dels Pirineus, Andorra la Vella, Andorra, October 22-24 1992 held at the Centre de Cogresos, Andorra la Vella, Andorra. **M.J.Walker**: "Indo-European and pre-Indo-European in Peninsular palaeoanthropology" NP
- 1992 **M.J.Walker**: La Cueva Negra de La Encarnación de Caravaca de la Cruz, Murcia: campaña de 1.991" in III Jornadas de Arqueología Regional, May 4-8 1992 held at the Dirección General de Cultura, Consejería de Cultura, Educación y Turismo de la Comunidad Autónoma de la Región de Murcia, Murcia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1998)
- 1992 **M.J.Walker**: La Cueva Negra de La Encarnación de Caravaca de la Cruz, Murcia: campaña de 1.991" in III Jornadas de Arqueología Regional, May 4-8 1992 held at the Dirección General de Cultura, Consejería de Cultura, Educación y Turismo de la Comunidad Autónoma de la Región de Murcia, Murcia. **M.J.Walker**, J.Zapata Crespo: "Estudio osteológico de la necrópolis de la Calle de la Era (Puerto de Mazarrón)" Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1998)
- 1991 **M.J.Walker**: "La Universidad de Oxford en los Picos de Europa: Los primeros años, 1961-1965" in Primer Congreso Espeleológico Internacional Sobre Picos de Europa, October 12-13 1992 held at the Universidad de Oviedo, Oviedo, Asturias, Spain. NP
- 1991 **M.J.Walker**: "Los sedimentos del Pleistoceno Superior de la Cueva Negra de la Encarnación, Caravaca de la Cruz (Murcia): campaña de 1.990" in II Jornadas de Arqueología Regional, June 4-7 1991 held at the Dirección General de Cultura, Consejería de Cultura, Educación y Turismo de la Comunidad Autónoma de la Región de Murcia, Murcia. Publications: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc (1996); see also C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1991) Publication: see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc.
- 1990 **M.J.Walker**: "La 'des-construcción' del pasado: la educación de los alumnos universitarios en la Arqueología científica" in Second World Archaeological Congress, Barquisimeto, Venezuela, September 4-8 1990 held at the Hotel Hilton, Barquisimeto, Venezuela. NP
- 1990 **M.J.Walker**: "Out of the dirt, into the computer. Agenda for Ecotechnology in SE. Spain" in Second World Archaeological Congress, Barquisimeto, Venezuela, September 4-8 1990 held at the Hotel Hilton, Barquisimeto, Venezuela. **M.J.Walker**: "Out of the dirt, into the computer. Agenda for Ecotechnology in SE. Spain" Publication: see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1990)
- 1989 **M.J.Walker**: "Skeletons in our cupboards" in Archaeological Ethics And The Treatment Of The Dead, World Archaeological Congress First Inter-Congress, August 7-10 1989 held at the University of South Dakota, Vermillion, South Dakota, USA. (This invited paper, for reasons never satisfactorily explained, does not appear in the volume of pre-circulated papers organized by Dr.L.Zimmerman, and despite his promise that publication of the Congress would take place, it has not done so and undoubtedly never will.)
- 1989 **M.J.Walker**: "Analoxies oportunes i inoportunes en la investigació prehistòrica: la descomposició del passat" in Coloquio Internacional Sobre El Canvi Cultural A La Prehistòria, March 2-4 1989, organized by the Universidad de Barcelona and Caixa de Catalunya, Barcelona, held at the Aula Cultural de la Caixa. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1990)

- 1989 **M.J.Walker**: "El Abrigo 2 de El Milano (Mula, Murcia): nuevas aportaciones antropológicas sobre el proceso funerario en el Eneolítico" in VI Congreso de la Sociedad Española de Antropología Biológica, Bilbao, September 18-22 1989 held at the Teatro Arriaga, Bilbao. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1991)
- 1987 **M.J.Walker**: "Aspects of human genetics in S.E. Spanish prehistory: epigenetic and multivariate craniometric analyses" in Perspectives in Human Biology, 1st Conference of the Australasian Society for Human Biology, July 23-31 1987 held at the The University of Western Australia, Perth, Western Australia, Australia. Publication: (A) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS; MINOR ARTICLES OR EARLY ARTICLES IN ENGLISH (1987)
- 1987 **M.J.Walker**: "Characterising prehistoric SE Spanish crania: some considerations of metrical and non-metrical observations" in Second Symposium On Upper Palaeolithic, Mesolithic And Neolithic Populations Of Europe And The Mediterranean Basin, Tel Aviv, Israel, September 6-10 1985 held at the Sackler Faculty of Medicine, University of Tel Aviv, Israel. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1989)
- 1987 **M.J.Walker**: "The archaeology of the grape-vine" in Rundle Foundation for Archaeology Conference On The Archaeology Of The Mediterranean, July 25-26 1987 held at Macquarie University, Sydney, New South Wales, Australia. NP
- 1986 **M.J.Walker**: "Craniometrical principal components and palaeogenetics: A possible interpretation of some S.E. Spanish data" in Fifth Congress of the European Anthropological Association, September 28-October 4 1986 held at the Gulbenkian Museum and Foundation, Lisbon, Portugal. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1988)
- 1986 **M.J.Walker**: "Society and habitat in neolithic and early bronze age S.E. Spain" in First World Archaeological Congress, September 1-7 1986 held at Southampton University, Southampton, U.K.. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1986)
- 1986 A.Cuenca Payá, **M.J.Walker**: "New light on the Plio-Pleistocene boundary problem in Alicante and Murcia" in Symposium On Climatic Fluctuations During The Quaternary In The Western Mediterranean Regions, Madrid, June 16-21 1986 held at the Universidad Autónoma de Madrid, Cantoblanco, Madrid. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1986)
- 1986 A.Cuenca Payá, P.J.Pomery, **M.J.Walker**: "Chronological aspects of the Middle Pleistocene in the coastal belt of southeastern Spain" in Symposium On Climatic Fluctuations During The Quaternary In The Western Mediterranean Regions, Madrid, June 16-21 1986 held at the Universidad Autónoma de Madrid, Cantoblanco, Madrid. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1986)
- 1986 A.Cuenca Payá, **M.J.Walker**: "Palaeoclimatological oscillations in continental Upper Pleistocene and Holocene formations in Alicante and Murcia" in Symposium On Climatic Fluctuations During The Quaternary In The Western Mediterranean Regions, Madrid, June 16-21 1986 held at the Universidad Autónoma de Madrid, Cantoblanco, Madrid. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1986)
- 1986 A.Cuenca Payá, **M.J.Walker**: "Palaeoecological aspects and palaeoeconomic interactions in southeastern Spanish prehistory" in Symposium On Climatic Fluctuations During The Quaternary In The Western Mediterranean Regions, Madrid, June 16-21 1986 held at the Universidad Autónoma de Madrid, Cantoblanco, Madrid. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1986)
- 1986 **M.J.Walker**: "Aspects of human genetics in S.E. Spanish prehistory: epigenetic and multivariate craniometrical analyses" in VIII Congreso de la Asociación Española de Historia de la Medicina, December 18-21 1986, held at Facultad de Medicina, Universidad de Murcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1988)
- 1986 **M.J.Walker**: "Nota acerca de la problemática de las craneosinostosis y su frecuencia en cráneos prehistóricos del Sureste español" in VIII Congreso de la Asociación Española de Historia de la Medicina, December 18-21 1986, held at the Facultad de Medicina, Universidad de Murcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (1988)
- 1986 A.Cuenca Payá, **M.J.Walker**: "Palaeoclimatic, palaeoenvironmental and anthropic interactions in S.E. Spanish Holocene prehistory. Part 1: Climatic and environmental evolution" in Commission On Measurement, Theory And Application In Geomorphology Of The Congress Of The International Geographical Union, Universities of Barcelona, Valencia, Murcia and Granada, June 5-15 1986, held at the Universidad de Murcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (F.López-Bermúdez, J.B.Thornes, eds, 1986)
- 1986 A.Cuenca Payá, **M.J.Walker**: "Palaeoclimatic, palaeoenvironmental and anthropic interactions in S.E. Spanish Holocene prehistory. Part 2: Palaeoenvironmental-palaeoeconomic interaction in later prehistoric times" in Commission On Measurement, Theory And Application In Geomorphology Of The Congress Of The International Geographical Union, Universities of Barcelona, Valencia, Murcia and Granada, June 5-15 1986, held at the Universidad de Murcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc (F.López-Bermúdez, J.B.Thornes, eds, 1986)
- 1986 **M.J.Walker**: "Consideraciones del uso y abuso de las inferencias analógicas y la problemática de la significación arqueológica" in Jornadas Sobre Metodología Arqueológica, September 29-October 4 1986 held at the Dirección General de Cultura, Consejería de Cultura, Educación y Cultura de la Comunidad Autónoma de la Región de Murcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1986)
- 1985 P.A.Lillo Carpio, **M.J.Walker**: "The Iberian monument of El Prado (Jumilla, Murcia, Spain)" in 1st Australian Congress of Classical Archaeology, July 9-14 1985, held at University of Sydney, Sydney, New South Wales, Australia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1990)
- 1984 **M.J.Walker**: "Avance al estudio de la craneología de El Argar y otros yacimientos en el sureste español" in Congreso Del Homenaje A Luis Siret 1934-1984, June 1984, held at Cuevas de Almanzora, Almería, Spain (organized by Dirección General de Cultura de la Junta de Andalucía). Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1986)
- 1984 **M.J.Walker**, A.Cuenca Payá: "Aspectos paleoclimáticos del Eneolítico alicantino" in Coloquio Del Eneolítico Del País Valenciano, December 1-2 1984, at Museo de Alcoi, Alcoi, Alicante. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1986)
- 1982 P.J.Habgood, **M.J.Walker**: "Analyse en composantes principales et classification hiérarchique de crânes du Pléistocène Supérieur" in Premier Congrès International de Paléontologie Humaine, October 1982, held at Parc de Valrose de l'Université de Nice, Nice, France. Publication: (FT) B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS (1986)
- 1982 P.A.Lillo Carpio, **M.J.Walker**: "Excavaciones arqueológicas en El Prado, Jumilla (Murcia) Campaña de 1980" in XVI Congreso Nacional de Arqueología Murcia-Cartagena 1982, January 8-11 1982, held at the Universidad de Murcia, Murcia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1983)
- 1982 **M.J.Walker**: "Elemental analysis of southeastern Spanish prehistoric coarse potsherds" in First Australasian Congress on Archaeometry, February 15-18 1982, held at The Australian Museum, Sydney, New South Wales, Australia. **M.J.Walker**: "Elemental analysis of southeastern Spanish prehistoric coarse potsherds" Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1982)
- 1982 G.Summerhayes, **M.J.Walker**: "Elemental analysis and taxonomy of prehistoric pottery from western Java" in First Australasian Congress on Archaeometry, February 15-18 1982, held at The Australian Museum, Sydney, New South Wales, Australia. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1982)
- 1981 **M.J.Walker**: "The site of El Prado (Murcia) and the copper age of South-East Spain" in Conference On The Archaeology Of The Iberian Peninsula, April 1981, held at University of Kent, Canterbury, U.K.. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1984)
- 1981 **M.J.Walker**: "Climate, economy and cultural change: the S.E. Spanish copper age" in X Congrès de l'Union Internationale des Sciences Préhistoriques et Protohistoriques, October 19-24 1981, held at the Museo Nacional de Antropología, México D.F., Mexico. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1981)
- 1981 A.Cuenca Payá, **M.J.Walker**: "Un posible cráneo fósil de Alicante, España" in X Congrès de l'Union Internationale des Sciences Préhistoriques et Protohistoriques, October 19-24 1981, held at the Museo Nacional de Antropología, México D.F., Mexico. Publication: (FT) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1981)
- 1978 **M.J.Walker**: "Quaternary stratigraphy of the Darling River near Tilpa, N.S.W." in Murray-Darling River Basin Conference of the Royal Society of Victoria, held at the National Museum of Victoria, Melbourne, Australia, November 30 1978. J.Bowler, E.Stockton, Publication: (FT) see B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS (1978)
- 1977 **M.J.Walker**: "Analogy, theory, and practice in prehistoric archaeology" in Australian Anthropological Association Congress, July 1977, held at the University of Sydney, Sydney, New South Wales, Australia. Publication: (FT) see B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS; MINOR ARTICLES OR EARLY ARTICLES IN ENGLISH (1984)
- 1977 **M.J.Walker**: "Early trans-Indian Ocean trade" in Section 25A of the Australia And New Zealand Association For The Advancement of Science Annual Meeting ANZAAS Annual Meeting, August 29-September 2 1977, held at the Australian National University, Canberra, ACT, Australia. B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS; MINOR ARTICLES OR EARLY ARTICLES IN ENGLISH (1977)
- 1976 **M.J.Walker**: "Towards a reclassification of Spanish Levantine and Andalusian neolithic and chalcolithic wares on the basis of computer analysis, and investigations into petrological inclusions and X-ray fluorescence of trace elements" in IX Congrès de l'Union des Sciences Préhistoriques et Protohistoriques, September 13-18 1976, held at Parc Valrose de l'Université de Nice, Nice, France. Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1976)
- 1976 **M.J.Walker**: "Epipalaeolithic origins of the Levantine Neolithic of Spain" in IX Congrès de l'Union des Sciences Préhistoriques et Protohistoriques, September 13-18 1976, held at Parc Valrose de l'Université de Nice, Nice, France. Publication: (A) see C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc. (1976)

- 1975 **M.J.Walker**, A.Cuenca Payá: "Nuevas fechas C-14 para el sector de Alicante y Murcia" in Segunda Reunión Nacional del Grupo Español de Trabajo el Cuaternario, September 15-20 1975, held at the Instituto de Estudios Pirenaicos del Consejo Superior de Investigaciones Científicas, Jaca, Huesca. Spain. Publication: (FT) see *B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc.* (1977)
- 1975 A.Cuenca Payá, **M.J.Walker**: "Paleogeografía humana del Cuaternario de Alicante y Murcia" in Segunda Reunión Nacional del Grupo Español de Trabajo el Cuaternario, September 15-20 1975, held at the Instituto de Estudios Pirenaicos del Consejo Superior de Investigaciones Científicas, Jaca, Huesca. Spain." Publication: (FT) *B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc.* (1977)
- 1974 **M.J.Walker**: "'Schematized' rock markings as archaeological evidence" in Australian Institute of Aboriginal Studies International Biennial Conference, April 1974, held at The Australian Institute of Aboriginal Studies, Canberra, ACT, Australia. Publication: (FT) see *C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc.* (1977)
- 1974 **M.J.Walker**: "The persistence of Upper Palaeolithic toolkits into the early south-east Spanish Neolithic" in Australian Institute of Aboriginal Studies International Biennial Conference, April 1974, held at The Australian Institute of Aboriginal Studies, Canberra, ACT, Australia. Publication: (FT) see *C. CONTRIBUTIONS IN BOOKS, ACTS OF MEETINGS, etc.* (1977)
- 1974 **M.J.Walker**: "Neolithic and chalcolithic pottery of S.E. Spain" in Symposium On Ceramics And Trade In Archaeology, 1974, held at the Department of Archaeology, University of Sydney, Sydney, New South Wales, Australia. Page proofs corrected and returned, but this symposium volume never saw the light of day because the Department of Archaeology never found the money to pay its printer!
- 1973 A.Cuenca Payá, **M.J.Walker**: "Comentarios sobre el Cuaternario continental en el centro y Sur de la provincia de Alicante" in Primera Reunión Nacional del Grupo Español de Trabajo el Cuaternario, October 8-11 1973, held at the Universidad Complutense, Madrid. Publication: (FT) *B. ARTICLES: B-2. ARTICLES IN SPANISH-LANGUAGE JOURNALS, YEARBOOKS, ANNUALS, etc.* (1974)
- 1964 **M.J.Walker**: "The mechanism of muscular contraction" Annual Conference of the British Association for the Advancement of Science, August 1964, held at the University of Aberdeen, Aberdeen, U.K., received First Prize for the Endeavour Prize Essay. Publication: (FT) see *B. ARTICLES: B-1. ARTICLES IN SIGNIFICANT JOURNALS* (1965)
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**The Murcian Regional Museum for Palaeontology and Human Evolution, built below Sima de las Palomas.**

**The building was finished in January 2013 and is waiting to be equipped to house Paloma and her family.**