Scientific Service of Heritage

Entomology & Arachnides

Recent invertebrates

Geology

Paleontology

Recent Vertebrates

Anthropology & Prehistory

≈ 37 000 000 specimens

≈ 200 000 type specimens and illustrated specimens

≈ 300 000 books

≈ 450 000 journal volumes

museum

Scientific Service of Heritage

Dotation: **60k€**
Offsite Storage: **45k€**
Library: **240k€**

General Director
Camille Pisani

Support Direction
Patricia Supply

Scientific Service of Heritage
Patrick Semal

Collections
Scientific Archives
Library

OD Publics
Pierre Coulon

OD Earth and History of life
Pascal Godefroit

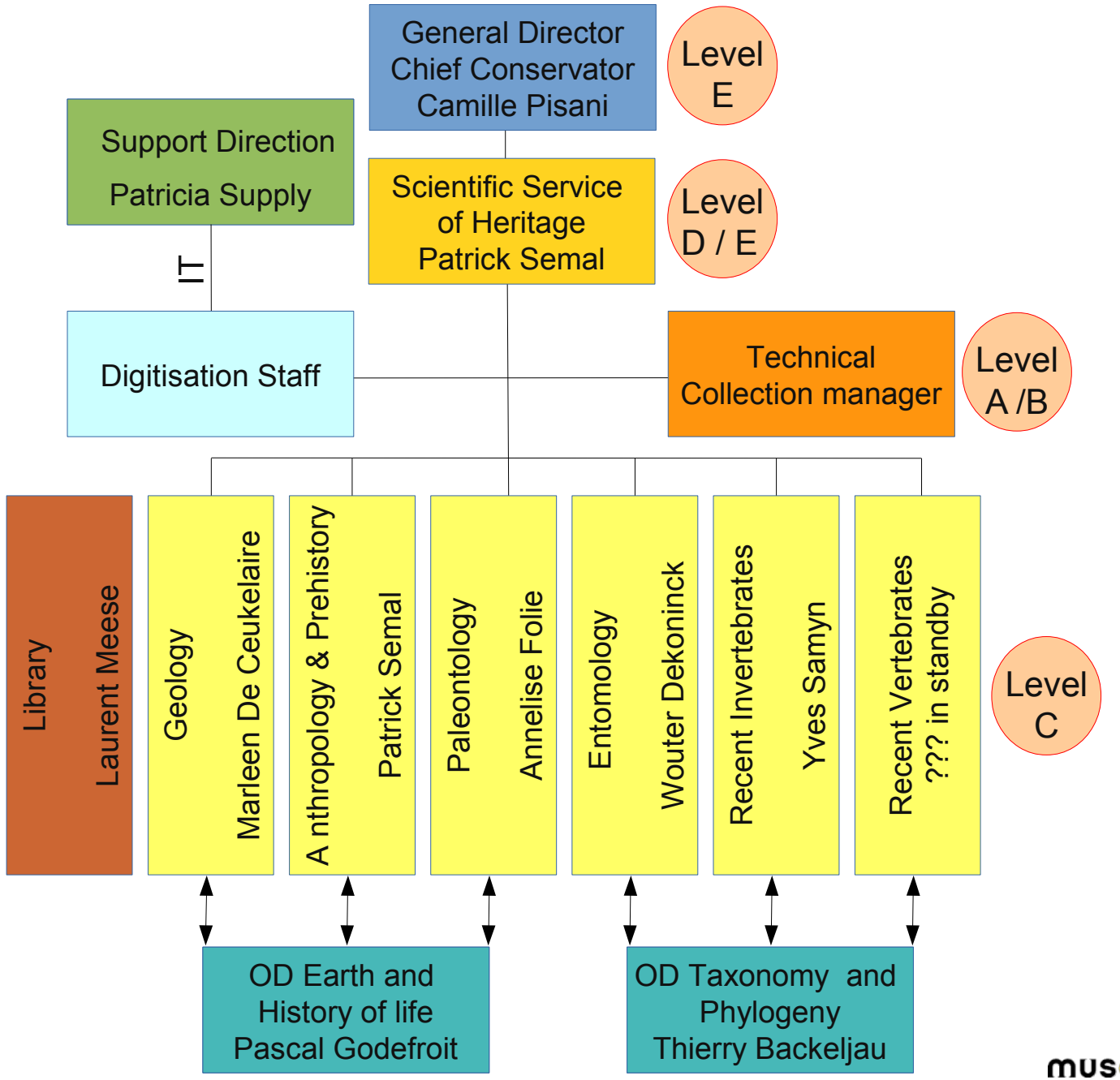
OD Taxonomy and Phylogeny
Thierry Backeljau

OD Natural Environnements
Patrick Rooze

Scientific Service of MUMM
Brigitte Lauwaert

museum

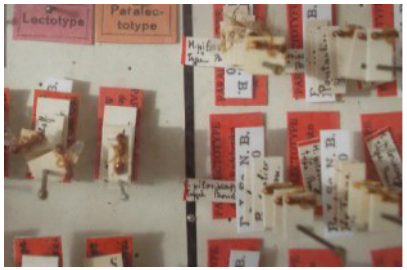
COMPETENCY FRAMEWORK NHM

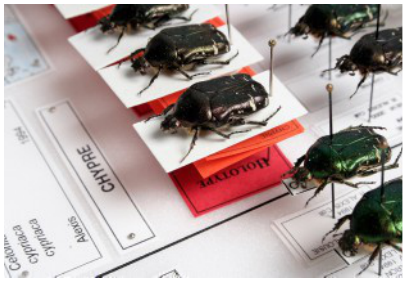


museum

Scientific Service of Heritage

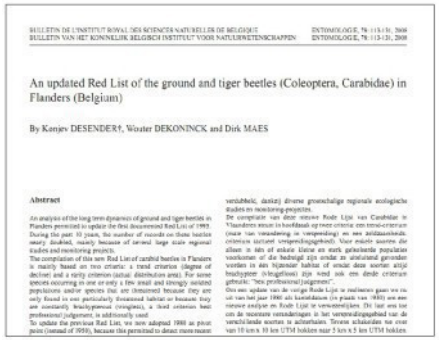
Entomology ≈ 70,000 drawers





> 17 millions specimens
~ 0,5 % type specimens

SSH
1 conservator, 3 collections managers, 2 encoders
+ OD
3 collections managers, 1 technician, 1 loan administrator

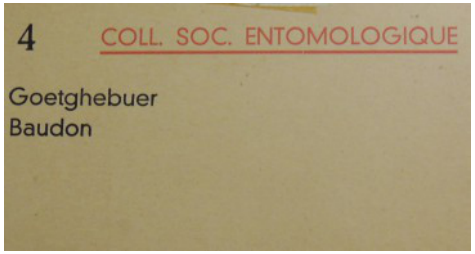


BULLETIN DE L'INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE ENTOMOLOGIE, 78: 113-130, 2008
BULLETIN VAN HET KONINKLIJK BELGISCH INSTITUUT VOOR NATUURWETENSCHAPPEN ENTOMOLOGIE, 78: 113-130, 2008

An updated Red List of the ground and tiger beetles (Coleoptera, Carabidae) in Flanders (Belgium)

By Kenjev DESENDER†, Wouter DEKONINCK and Dirk MAES

Abstract



General Collection
Type specimens
World

Belgian Collection
Monitoring
Red Lists
Belgium

RBES

Explorations
Leopold III
World

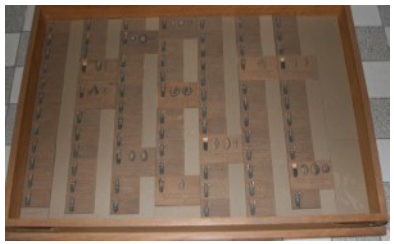
museum

Scientific Service of Heritage

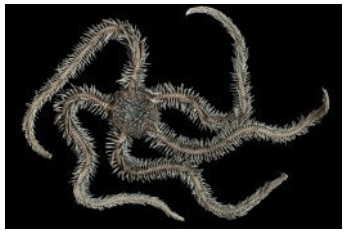
Recent Invertebrates – 9,000 drawers, 100,000 jars

> 10 millions specimens
~ 0,5 % type specimens
1 conservator, 3 collections managers, 2 encoders
+ OD variable

Mollusca
General Collection
Belgian Collection
Type collection
Thematic collections



Recent Invertebrates
General Collection
Belgian Collection
Type collection
Thematic collections



Explorations
Belgica, NPCongo ,
Leopold III
World

Ecological collections
Invertebrates, insects,
vertebrates

VLAAMSE MILIEUMAATSCHAPPIJ

museum

Scientific Service of Heritage

Vertebrates: 12,000 drawers and more than 35,000 jars

Birds: 82,000 specimens
92 type specimens

More than 600,000 specimens
736 type specimens

1 conservator
3 collections managers
1 encoder
1 technician taxidermy

Reptiles: 45,000 specimens
183 type specimens

Fish: 285,000 specimens
325 type specimens

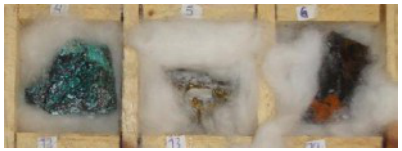
Mammals: 42,000 specimens
27 type specimens

Amphibians: 135,000 specimens
109 type specimens

museum

Scientific Service of Heritage

Geology : reference collections



Lithology
Mineralogy
World

1 conservator
1 collections managers
1 encoder

Cores
Belgium

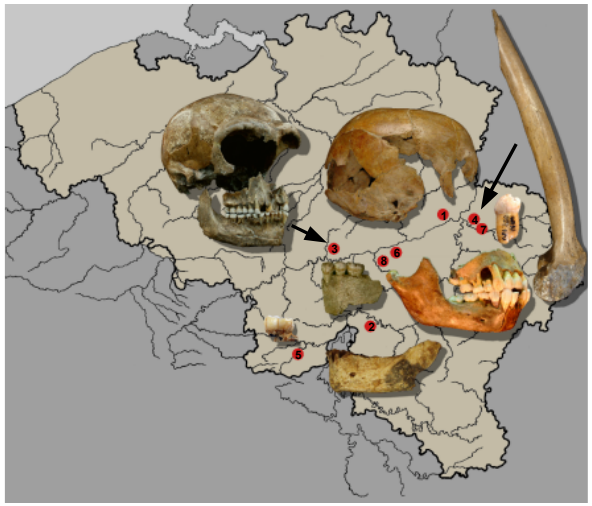
Meteorites
Antarctica + World

Natural Stones
Cultural Heritage

museum

Scientific Service of Heritage (2013-2018)

Anthropology & Prehistory : largest collections in Belgium



Paleolithic

Belgium

DRC

Neolithic

Belgium

Historic

Belgium + World

museum

Scientific Service of Heritage (2013-2018)

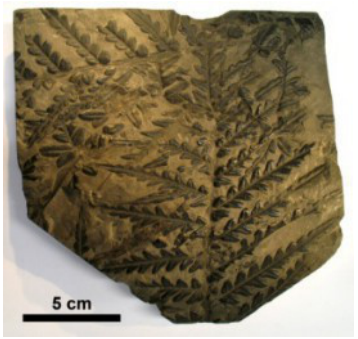
Paleontology

1 conservator
2 collections managers

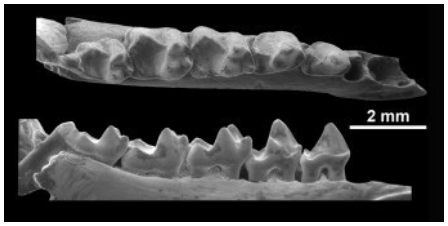
Fishes (Carboniferous, Belgium)
Benedenius deneensis, IRSNB P 1261

Trilobites (Devonian, Morocco)
Cyphaspis walteri, IRSNB a12875

Crustaceans (Maastrichtian, Belgium)
Callianassa faujasi, Invert-6521-1b



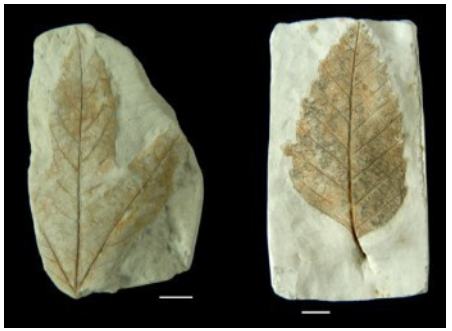
Ferns (Westphalian, Belgium)
*Mariopteris muricata, n°3*242



Dormaal Fauna (Eocene, Belgium)
Teilhardina belgica, IRSNB M64

Insects (Carboniferous, France)
Meganeura sp., Cast-Invert-22

Gastropods (Lutetian, France)
Sigatica obovata, Invert-10591-188



Gelinden Flora (Paleocene, Belgium)
Aralia looziana, n° 68241
Quercusloozi, n°68150

Fossil Vertebrates

Fossil Invertebrates
Paleozoïc

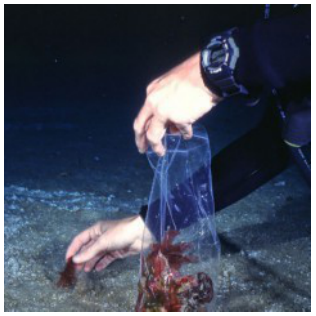
Fossil Invertebrates
Meso- and Cenozoïc

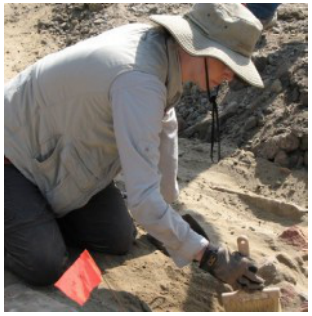
Fossil Plants

museum

Scientific Service of Heritage (2013-2018)

Origin(s) of the Collections





a. Explorations in Belgium and the rest of the World
- linked with research projects
- monitoring (internal and/or conventions)
- improve the scientific value of the collections

b. Complete existing collections with specific focus on groups
- with internal expertise
- with external expertise but strong collaboration

c. Hand donation
- Belgian material + World
- didactic value

d. Exchanges & desiderata
- better overview of biodiversity
- reference collections for specific groups

e. No specific budget to buy collections.
- Collaboration with scientific ODs
- Collaboration with Public OD

museum

Scientific Service of Heritage (2013-2018)

Acquisitions / priorities

First priority
Strengthen collections on which the RBINS has current specialization and recognized historical interest
(emphasis on collections from threatened areas)

Second priority
Broaden collections to allow comparative research
(emphasis of types and figured specimens)

Third priority
Build collections outside the current research of the RBINS but with potential for future research
(emphasis on collections that can be studied with molecular techniques).

Fourth priority
Acquire collections that strengthen the museum
(emphasis on specimens with didactic value)

museum

Scientific Service of Heritage (2013-2018)

Acquisitions / criteria

Scientific footprint of collections
(e.g. types, rarity, complementary research material, scope)

Spatial footprint of collections
(e.g. shelf space)

Financial footprint of collections
(e.g. cost of acquisition, curation, valorization)

Standards of documentation
(data and metadata)

ABS Compliance
CETAF: Code of Conduct and Best Practice for Access and Benefit-Sharing
National Focal point : DG Environment

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Scientific Service of Heritage (2013-2018)

Access and Benefit Sharing

Consortium of European Taxonomic Facilities (CETAF)

Code of Conduct and Best Practice for Access and Benefit-Sharing

Contents

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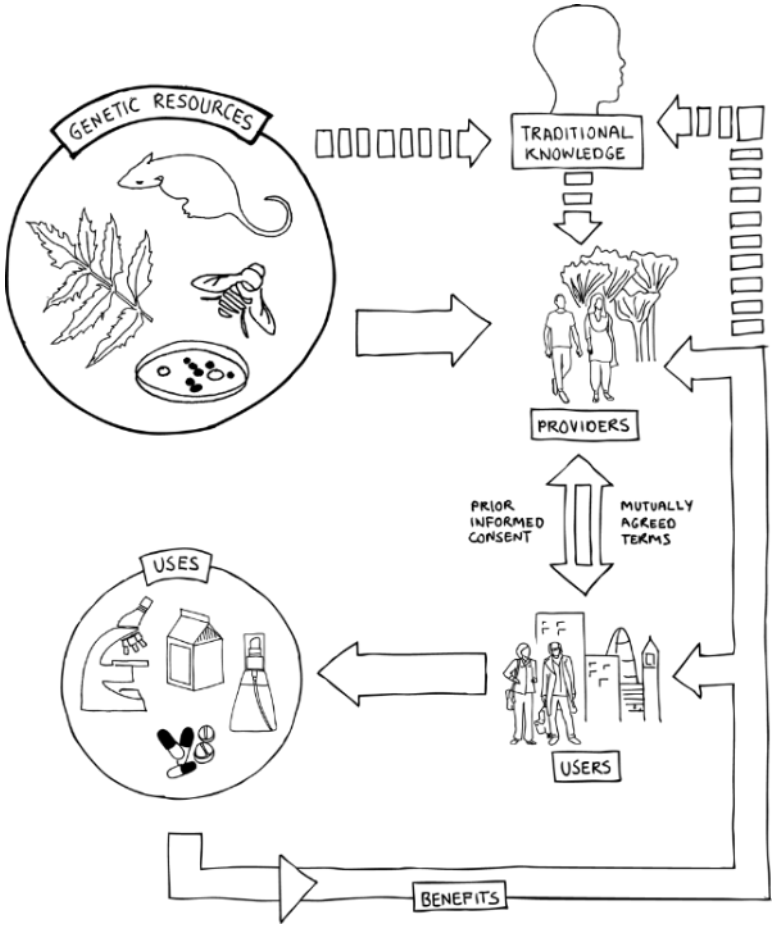
Introduction

CETAF, the Consortium of European Taxonomic Facilities, is a networked consortium of non-commercial scientific institutions in Europe formed to promote training, research and understanding of systematic biology and palaeobiology. Together, CETAF institutions hold very substantial biological (zoological and botanical), palaeobiological, and geological collections and provide the resource for the work of thousands of researchers in a variety of scientific disciplines.

As a response to Article 20 in the Nagoya Protocol, and Articles 8 and 13 of the *European Regulation on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union* CETAF has developed and adopted this Code of Conduct for Access and Benefit-Sharing, together with the annexed Best Practice. Also annexed is a 'Statement of Use of Biological Material' to provide clarity on how CETAF members use and treat samples of biological material.

The principles and practices stated below are designed to fully support CETAF members' operations as taxonomic collection-holding and non-commercial biological research institutions in complying with Access and Benefit Sharing (ABS) legal and ethical requirements. The documents (i) outline the Code of Conduct governing principles under which collections are managed and collection-based research conducted in CETAF member institutions; (ii) provide details of best practices to ensure implementation of those principles; (iii) explain to both Providers and users how biological specimens are used by CETAF institutions, which will support the negotiation of Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT) with Providers.

1



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Scientific Service of Heritage

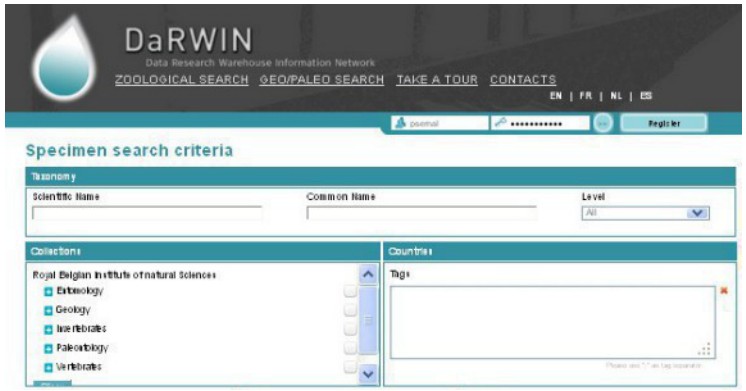
Priorities 2013-2018

a. Certification of the RBINS collections under ISO9001 and EMAS

b. Location of types and illustrated specimens

c. Inventory and encoding in DaRWIN, MARS and Libis

d. Collections in alcohol : reconditioning and plan of compliance



Scientific Service of Heritage

Infrastructures and Storages

« Desaturation » of storages rooms

14000 m³ Vautier Site

1364 m³ offsite (45 k€ /year)

Re-organizing our collections to

- Rationalize available space
- Reboxing before or during digitization
- Improve security of unique and rare specimens

Library

- New compactus for storage
- New Knowledge Center for Library
- Integration of the GSB and SRBAP libraries

museum

Scientific Service of Heritage: Digitization

Digitization of the collections and libraries

Brecko J., *AGORA3D* 2014

a. DIGIT-3: 2014 – 2018 (BELSPO)
- Scanning of unique scientific documentation
- Digitization of types and illustrated specimens
- Digitization of RBINS publications

≈ 300 k€ / year

b. Investigation of new techniques of digitization
- 2012-2014 AGORA3D
- 2015 BRAIN Axe 6 proposal
- 2014-2015 JRA Synthesys 3
- 2012-2016 COSCH (EU Cost TD1201)

c. Web Databases

DaRWIN Specimens data and metadata

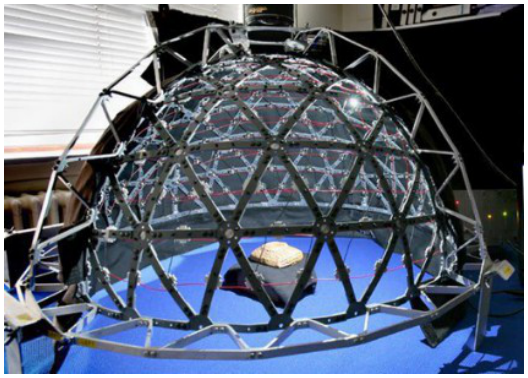
MARS Collection management & multimedia

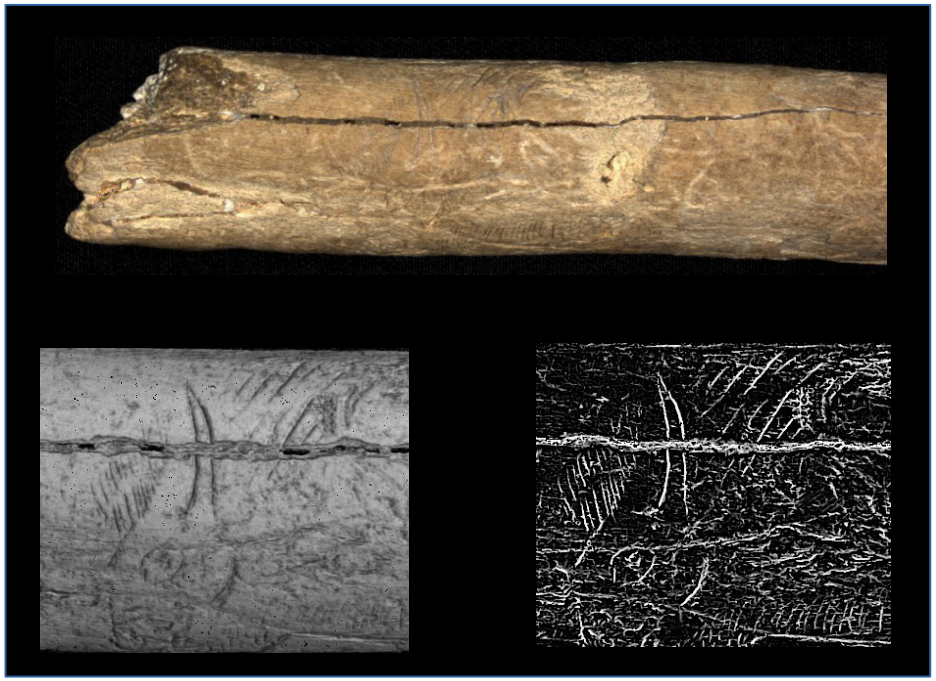
f. Backup archives and digital data (with ICT) internal + external

museum

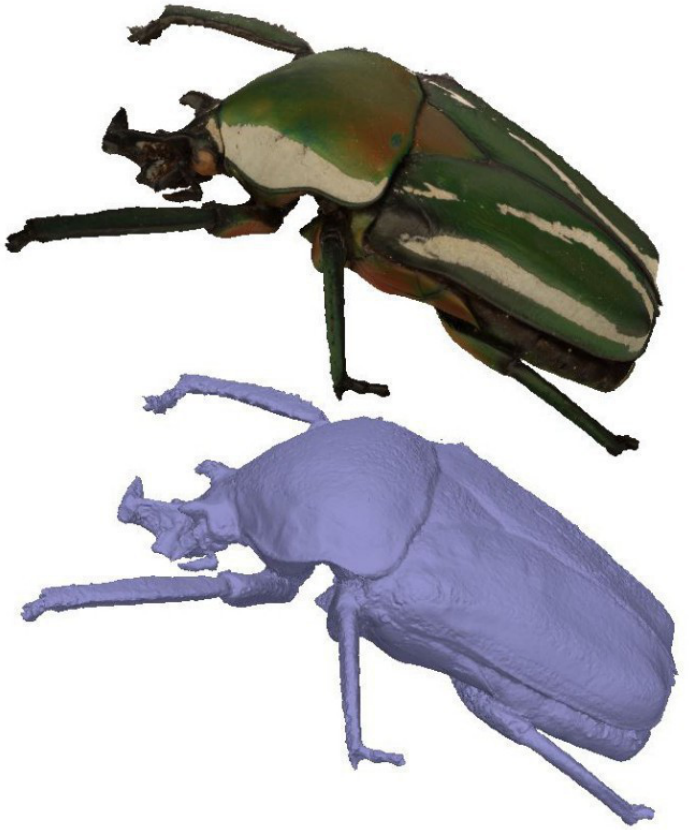
Scientific Service of Heritage: Digitization

New methods for specimens digitization





M. Proesman, *AGORA3D*, KUL 2012



Brecko *et al.*, *Zookeys* 2014

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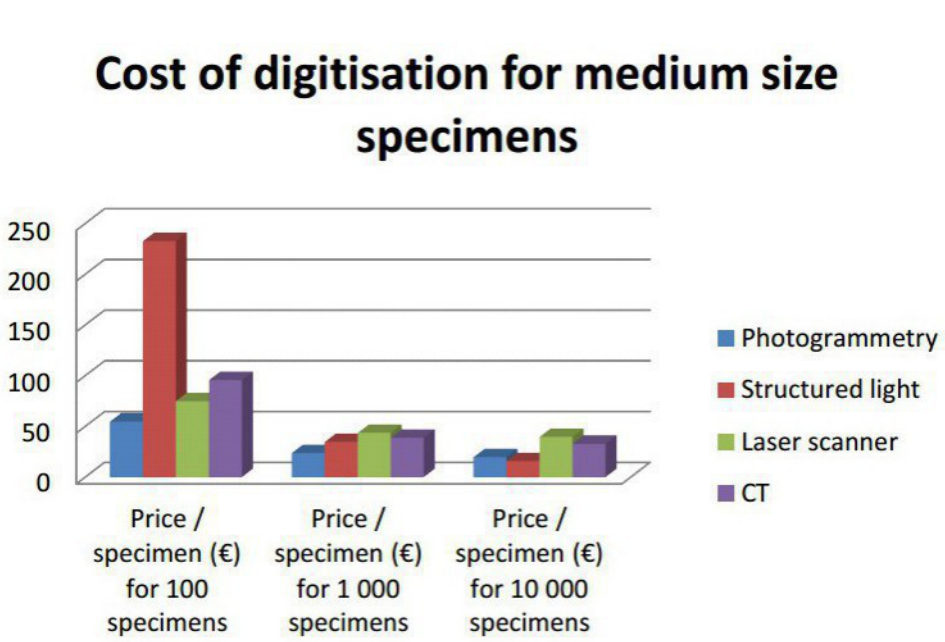
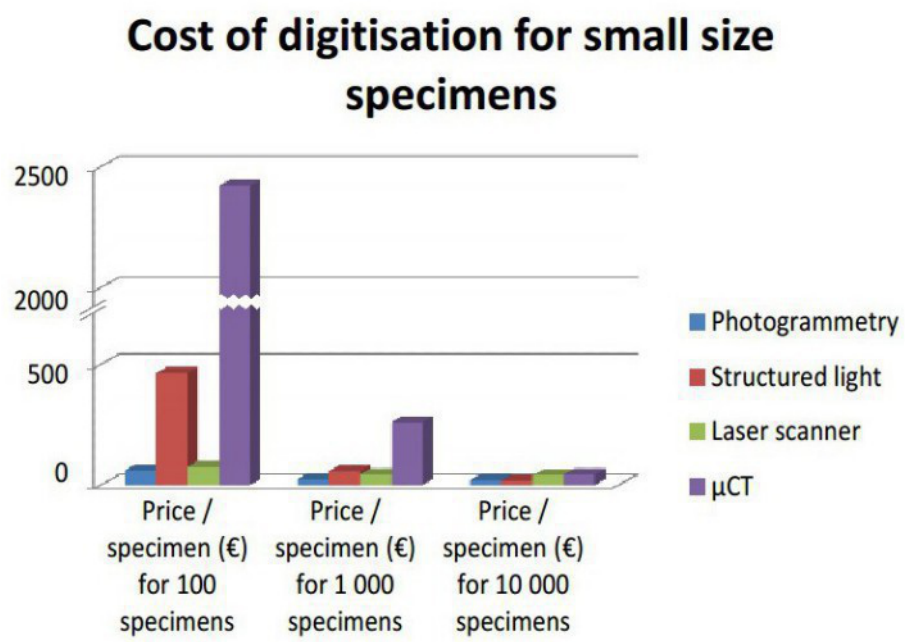
Scientific Service of Heritage (2013-2018)

Cost evaluations 2D + and 3D digitization



Graph 1: Cost of the digitisation of 1 middle sized specimen in function of the technique and of the quantity of specimens to be digitised. The cost takes into account the equipment, time of digitisation and salary of the staff.



Graph 2: Cost of the digitisation of 1 small sized specimen in function of the technique and of quantity of specimens to be digitised. The cost takes into account the equipment, time of digitisation and salary of the staff.

Mathys *et al.*, Euro Med 2014

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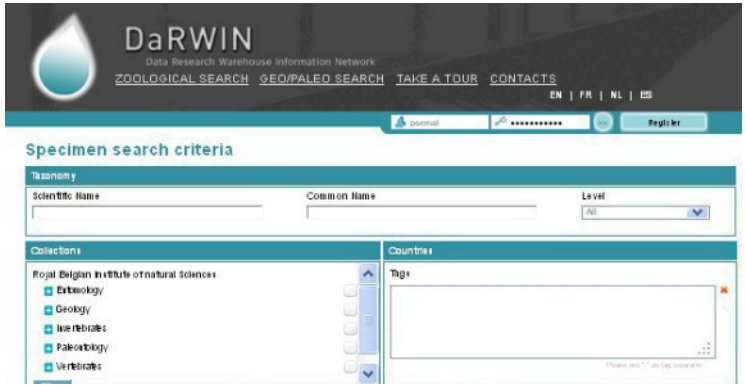
Scientific Service of Heritage (2013-2018)

Digitization of the collections



Postgress SQL, Open Source GitHub
Highly structured specimen data
2014 : 300000 records
or 3 millions specimens

c

Export / Import
BIOCASE, GEOCASE, DNA
import ABCD EFG templates

Plone/Zope, Open Source GitHub
Flexible Multimedia Collection Management System
2014 : Digital storages, Rich inventories, Archives
Digital Collection Open Access
Biblio4Plone

Export / Import
CSV, XML Dublin Core
import CSV

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Scientific Service of Heritage (2013-2018)

Digitization priorities: Types & Illustrated specimens

Brecko J., *AGORA3D* 2014

Collaboration with RMCA !

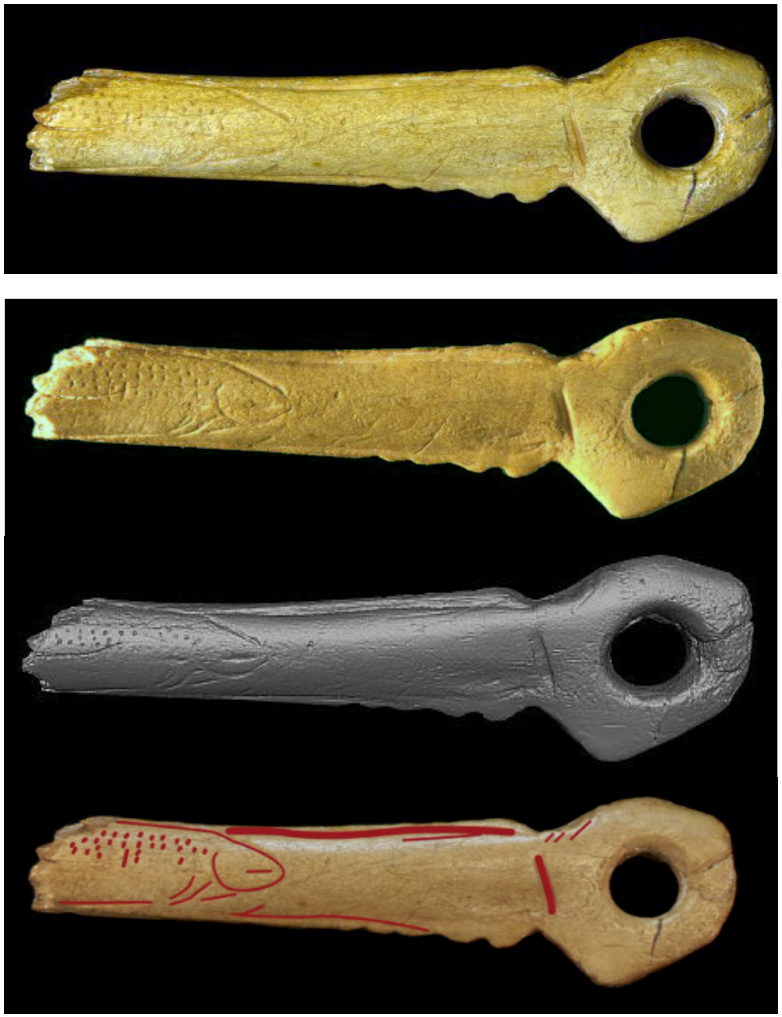
a. DIGIT-3 : 2014 – 2018 (BELSPO)
(≈ 300 k€ / year) (7.5 FTE/year)
- Encoding data & metadata in Darwin
- 2D+ , 3D High Resolution Digitization
- Scan of RBINS publications
- Internal staff = 8.5 FTE/year

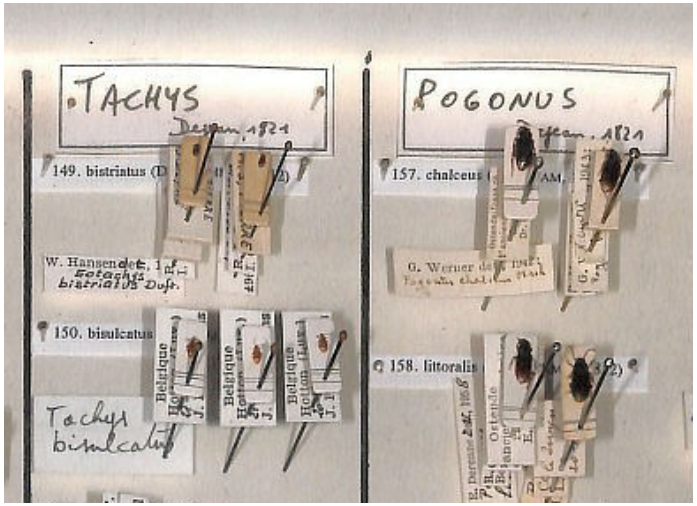
b. Open Access
Access to the digital collections
Valorisation platform of DIGIT/BELSPO, DaRWIN (ICT), MARS (ICT + external)

museum

Scientific Service of Heritage

Digitization priorities: according to opportunities





Mathys A., DIGIT03 2014

museum

Scientific Service of Heritage (2013-2018)

Valorization: Popular & Citizen Science

a. Access to collections (with Public OD)
Permanent and temporary exhibitions

b. Improving RBINS websites and species.be
with images of RBINS digitized specimens

c. Contribution to external exhibitions (loans)

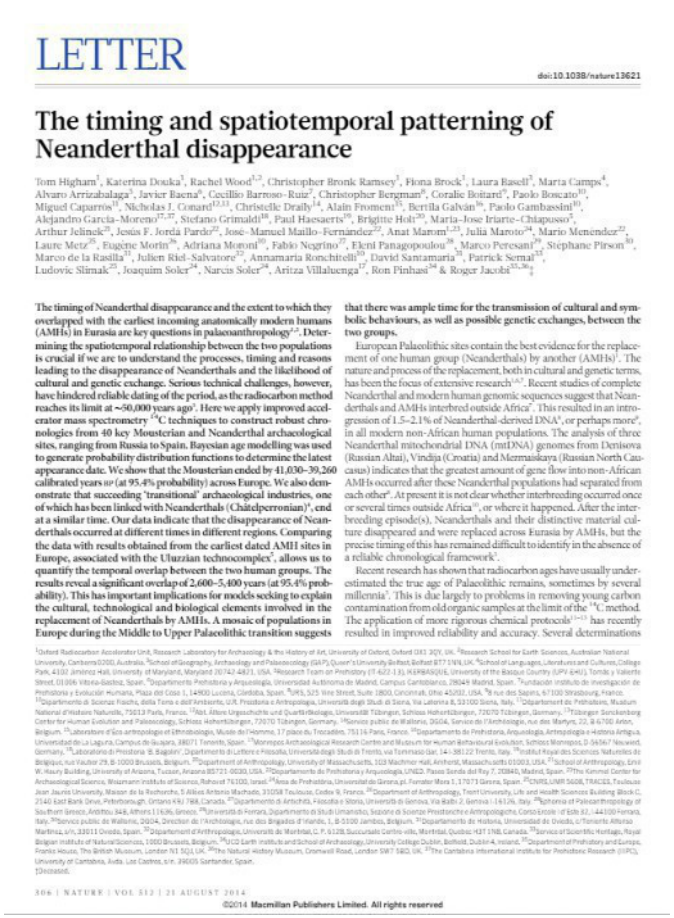
d. Knowledge center (Library, Public OD and DIGIT)

e. Citizen Science : amateurs work related to collections
Entomology : 30
Invertebrates: 25
Paleontology : 8

museum

Scientific Service of Heritage (2013-2018)

Valorization: Publications related to collections



LETTER

doi:10.1038/nature13621

The timing and spatiotemporal patterning of Neanderthal disappearance

Tom Higham[1], Katerina Douka[1], Rachel Wood[1,2], Christopher Bronk Ramsey[1], Fiona Brock[1], Laura Basell[1], Marta Camps[1], Alvaro Arrizabalaga[3], Javier Baena[4], Cecilio Barroso-Ruiz[5], Christopher Bergman[6], Coralie Boitard[7], Paolo Boscato[13], Miguel Caparrós[11], Nicholas J. Conard[12,13], Christelle Draily[14], Alain Froment[15], Bertila Galván[16], Paolo Gambassini[17], Alejandro García-Moreno[17,37], Stefano Grimaldi[18], Paul Haesaerts[19], Brigitte Holt[20], María-Jose Iriarte-Chiapusso[5], Arthur Jelinek[21], Jesús F. Jordá Pardo[22], José-Manuel Maíllo-Fernández[22], Anat Marom[1,23], Julià Maroto[24], Mario Menéndez[25], Laure Metz[26], Eugène Morin[28], Adriana Moroni[10], Fabio Negrino[29], Eleni Panagopoulou[30], Marco Peresani[31], Stéphane Pirson[32], Marco de la Rasilla[33], Julien Riel-Salvatore[34], Annamaria Ronchitelli[10], David Santamaría[35], Patrick Semal[32], Ludovic Slimak[23], Joaquim Soler[24], Narcís Soler[24], Aritza Villaluenga[17], Ron Pinhasi[36] & Roger Jacobi[38,39]

The timing of Neanderthal disappearance and the extent to which they overlapped with the earliest incoming anatomically modern humans (AMHs) in Eurasia are key questions in palaeoanthropology[1,2]. Determining the spatiotemporal relationship between the two populations is crucial if we are to understand the processes, timing and reasons leading to the disappearance of Neanderthals and the likelihood of cultural and genetic exchange. Serious technical challenges, however, have hindered reliable dating of the period, as the radiocarbon method reaches its limit at ~50,000 years ago[3]. Here we apply improved accelerator mass spectrometry ^{14}C techniques to construct robust chronologies from 40 key Mousterian and Neanderthal archaeological sites, ranging from Russia to Spain. Bayesian age modelling was used to generate probability distribution functions to determine the latest appearance date. We show that the Mousterian ended by 41,030–39,260 calibrated years BP (at 95.4% probability) across Europe. We also demonstrate that succeeding 'transitional' archaeological industries, one of which has been linked with Neanderthals (Châtelperronian)[4], end at a similar time. Our data indicate that the disappearance of Neanderthals occurred at different times in different regions. Comparing the data with results obtained from the earliest dated AMH sites in Europe, associated with the Uluzzian technocomplex[5], allows us to quantify the temporal overlap between the two human groups. The results reveal a significant overlap of 2,600–5,400 years (at 95.4% probability). This has important implications for models seeking to explain the cultural, technological and biological elements involved in the replacement of Neanderthals by AMHs. A mosaic of populations in Europe during the Middle to Upper Palaeolithic transition suggests that there was ample time for the transmission of cultural and symbolic behaviours, as well as possible genetic exchanges, between the two groups.

European Palaeolithic sites contain the best evidence for the replacement of one human group (Neanderthals) by another (AMHs)[1]. The nature and process of the replacement, both in cultural and genetic terms, has been the focus of extensive research[1,6,7]. Recent studies of complete Neanderthal and modern human genomic sequences suggest that Neanderthals and AMHs interbred outside Africa[8]. This resulted in an introgression of 1.5–2.1% of Neanderthal-derived DNA[8], or perhaps more[9], in all modern non-African human populations. The analysis of three Neanderthal mitochondrial DNA (mtDNA) genomes from Denisova (Russian Altai), Vindija (Croatia) and Mezmaiskaya (Russian North Caucasus) indicates that the greatest amount of gene flow into non-African AMHs occurred after these Neanderthal populations had separated from each other[9]. At present it is not clear whether interbreeding occurred once or several times outside Africa[10], or where it happened. After the interbreeding episode(s), Neanderthals and their distinctive material culture disappeared and were replaced across Eurasia by AMHs, but the precise timing of this has remained difficult to identify in the absence of a reliable chronological framework[1].

Recent research has shown that radiocarbon ages have usually underestimated the true age of Palaeolithic remains, sometimes by several millennia[3]. This is due largely to problems in removing young carbon contamination from old organic samples at the limit of the ^{14}C method. The application of more rigorous chemical protocols[11–13] has recently resulted in improved reliability and accuracy. Several determinations

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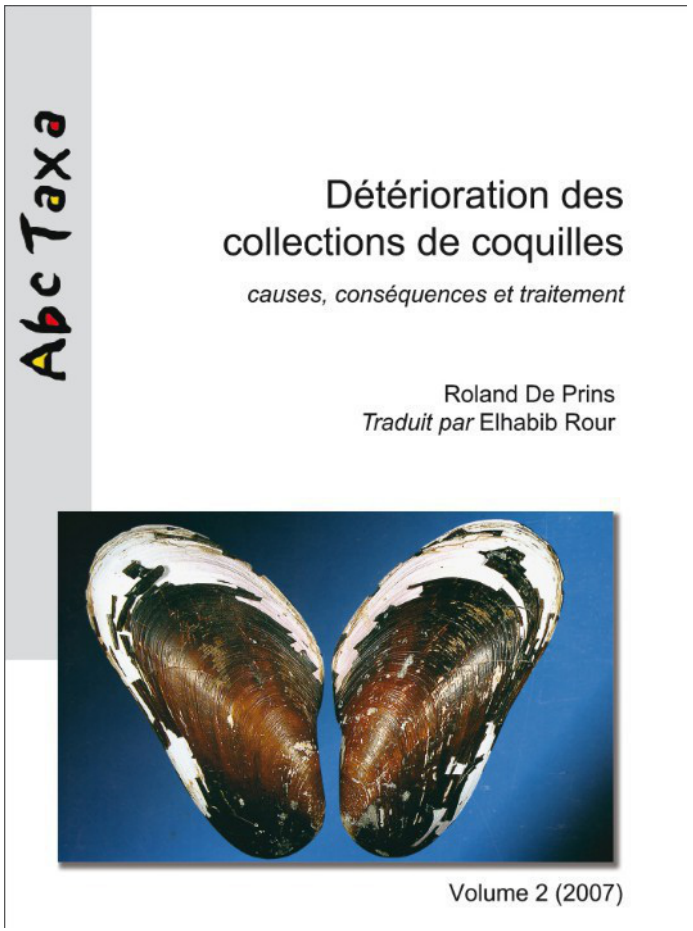

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