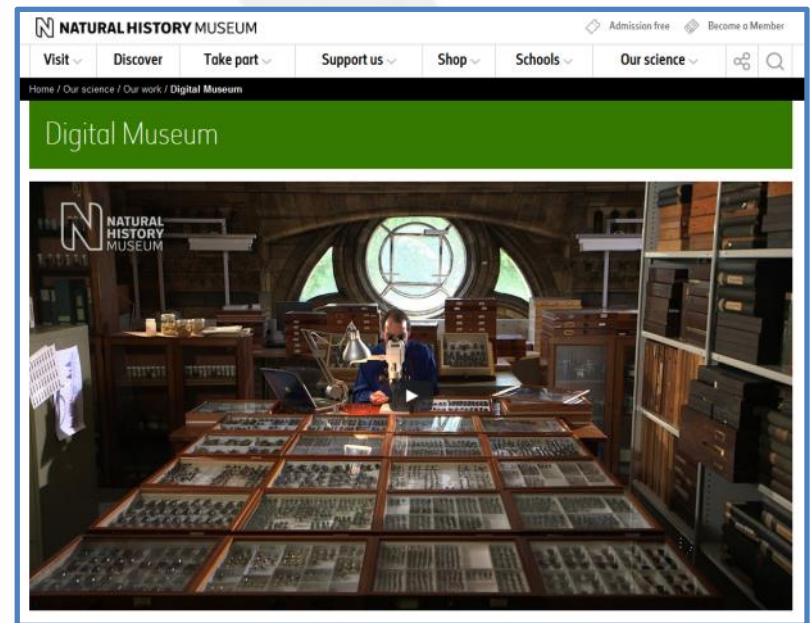


eMesozoic: an alternative approach to digitising palaeontological collections

Philippa Brewer, Liadan Stevens, Emma L Bernard, Sandra Chapman, Lorna Steel, Anna Taylor, Lyndsey Douglas, David Godfrey, Francesca Taylor, **Vladimir Blagoderov**, Lawrence N. Hudson, David Smith & Molly Clery

Digitisation @ the NHM

80 million specimens!



<http://www.nhm.ac.uk/our-science/our-work/digital-museum.html>

eMesozoic

Suggest a project which looks at the worse case scenario for digitisation, but use dinosaurs to make everything seem better....



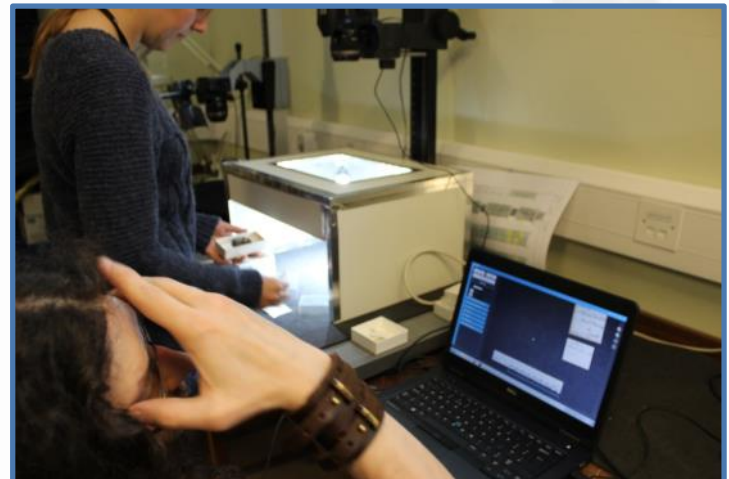
CHALLENGES: Digitising historical palaeontological collections with complex histories

- Wide range of specimen sizes and types, from delicate sub-millimetre teeth to heavy sauropod bones which extend across several collection locations
- Storage areas which are difficult to work in
- Availability and quality of specimen documentation varies widely, with information held in various media
- Differing, complex and inconsistent registration practices



eMesozoic: The Brief

- British Mesozoic vertebrate specimens
- 18,000 specimens
- 1 year
- £100,000
- Develop workflows
- Estimate the cost of digitisation for palaeontological specimens at the NHM



THE PROCESS: Preparation

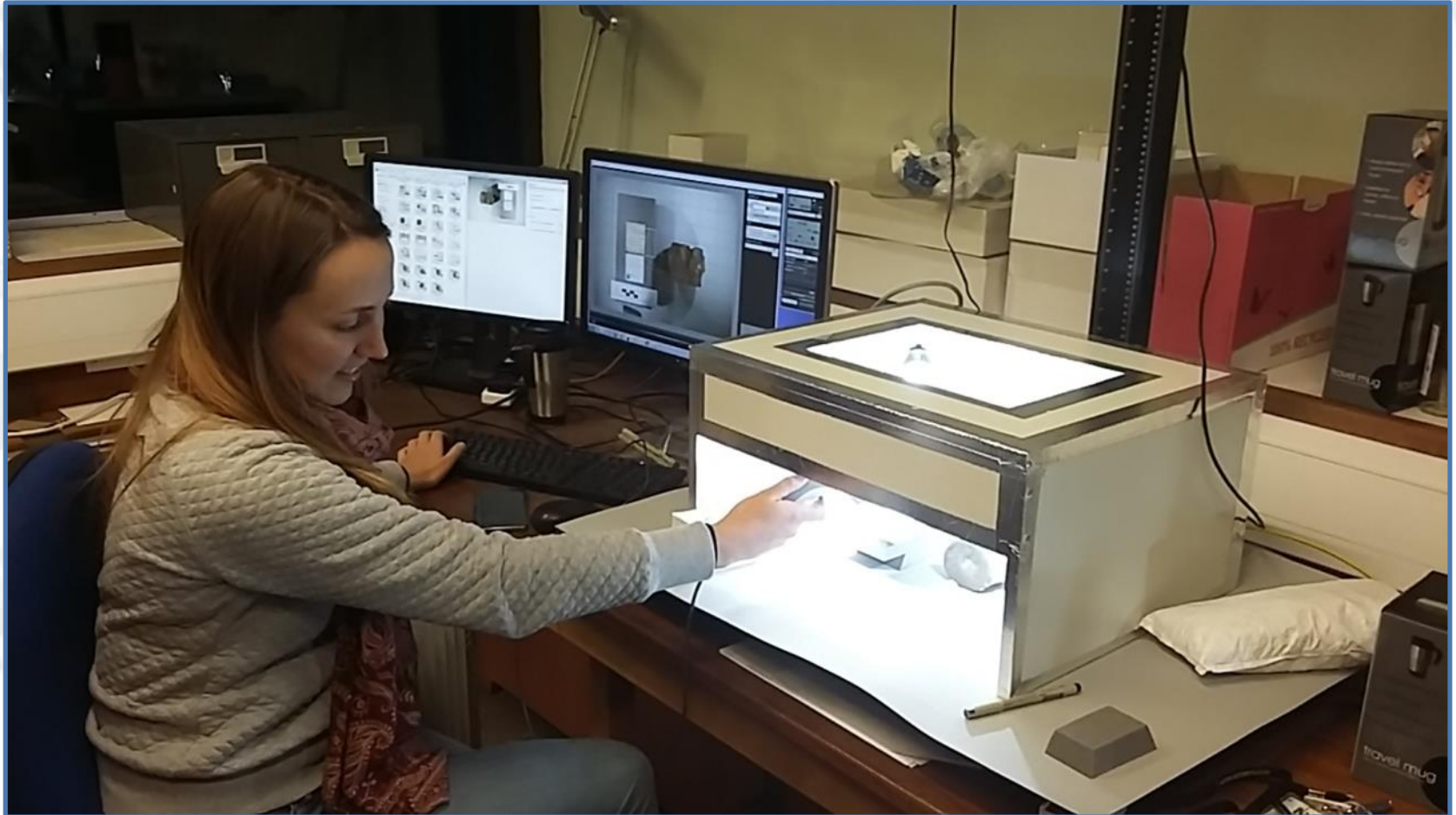
- Produce stub catalogue records for those not already on our Collections Management System
- Attach images of register pages to catalogue records
- Identify British Mesozoic specimens
- Barcode collections locations
- Prepare collections for digitisation



THE PROCESS: Imaging



THE PROCESS: Imaging



THE PROCESS: Imaging

Average imaging rates (specimens per person per day):

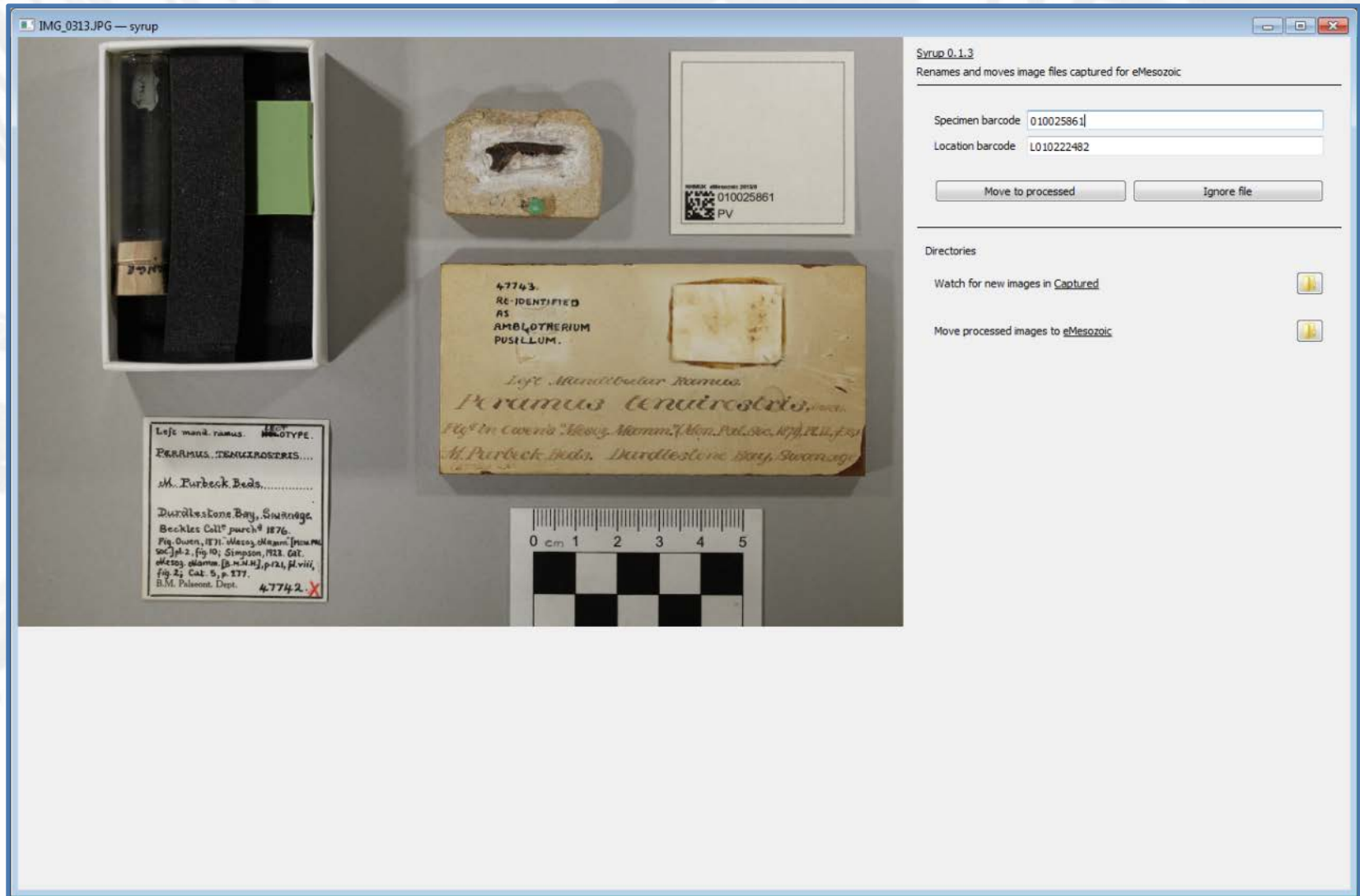
- Across all workflows: 76
- Small workflow only: 95
- Medium workflow only: 35
- Large workflow only: 23



Varies considerably depending on specimen / collection type

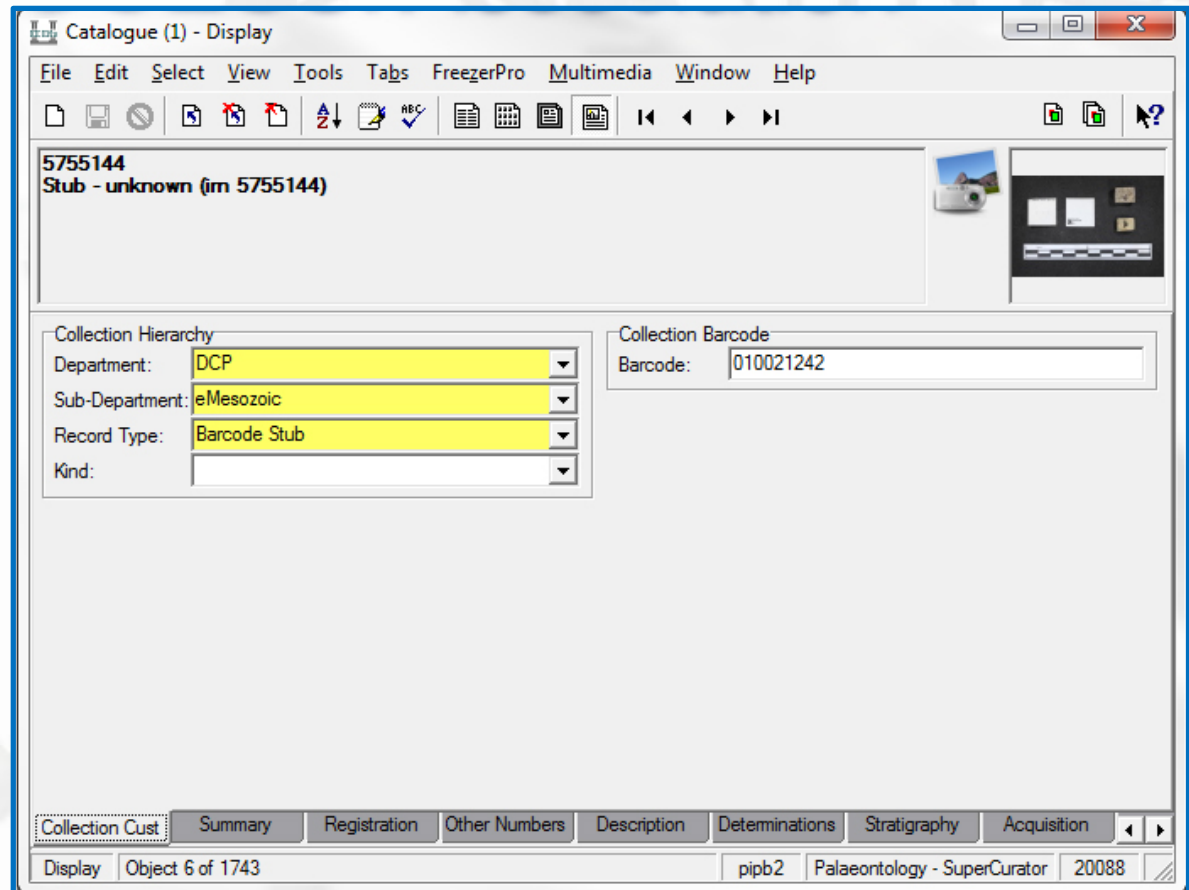
- Dinosaurs: Between 26 and 160 small specimens imaged per person per day (average of 80)
- Mammals: Between 84 and 267 small specimens imaged per person per day (average of 169)

THE PROCESS: Imaging



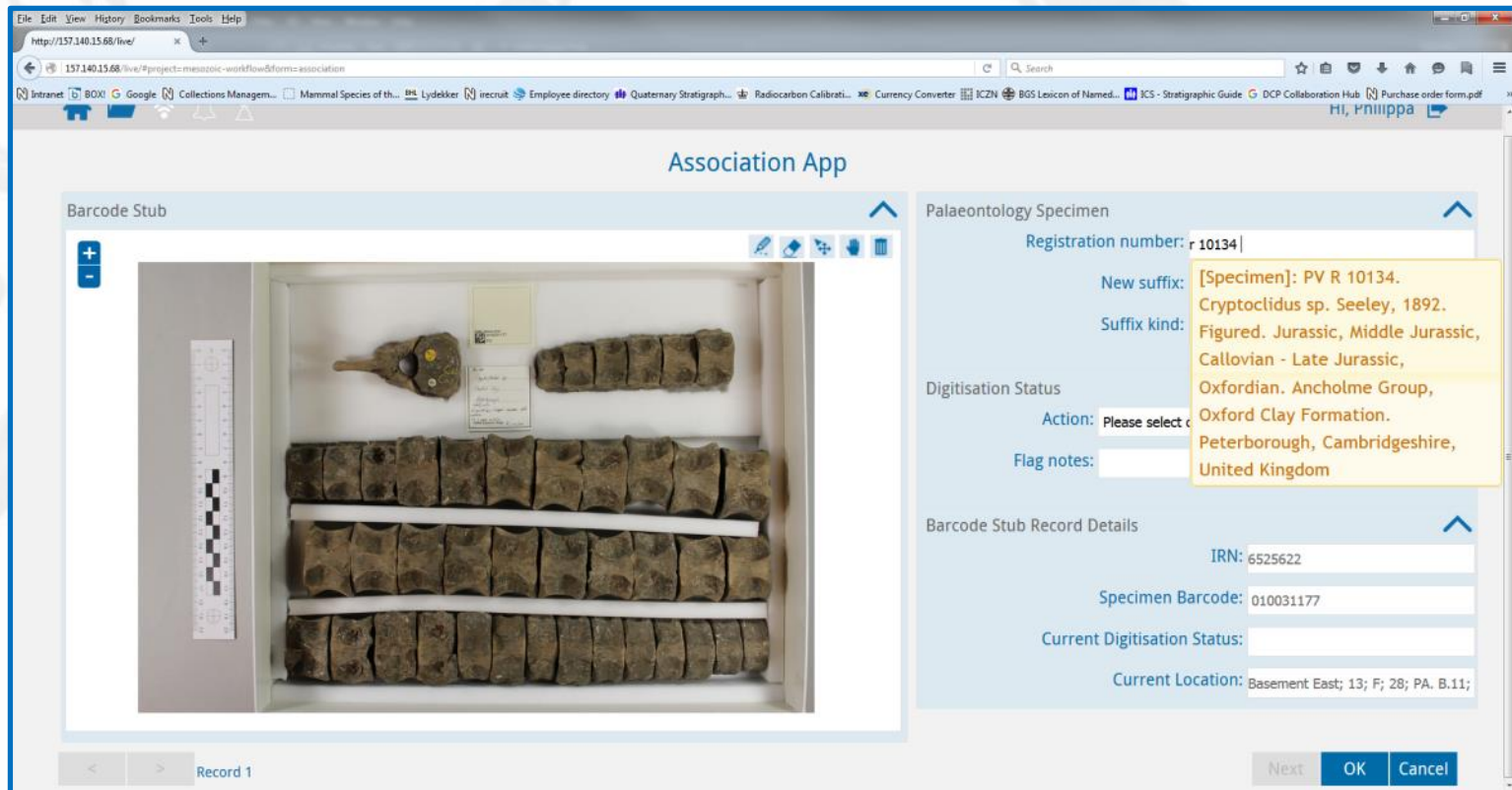
THE PROCESS: Association

- Creation of Barcode Stub records to aid ingestion and association



THE PROCESS: Association

- Web-based form to associate images taken with catalogue records (or create new records)



The screenshot displays a web browser window with the URL `http://157.140.15.68/live/`. The page title is "Association App". The interface is divided into two main sections:

- Barcode Stub:** Contains a photograph of a specimen box. The box is open, revealing several rows of small, dark, fossilized specimens. A ruler is visible on the left side of the box for scale. A small label is attached to the top right of the box.
- Palaeontology Specimen:** A form for entering specimen details. The "Registration number" field contains "r 10134". A dropdown menu is open for the "New suffix" field, showing the following options:
 - [Specimen]: PV R 10134.
 - Cryptoclidus sp. Seeley, 1892.
 - Suffix kind: Figured. Jurassic, Middle Jurassic, Callovian - Late Jurassic, Oxfordian. Ancholme Group, Oxford Clay Formation. Peterborough, Cambridgeshire, United Kingdom
- Barcode Stub Record Details:** Fields for "IRN" (6525622), "Specimen Barcode" (010031177), "Current Digitisation Status", and "Current Location" (Basement East; 13; F; 28; PA. B.11).

At the bottom of the form, there are "Next", "OK", and "Cancel" buttons. The page also shows a "Record 1" indicator at the bottom left.

THE PROCESS: Transcription

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

[Master] *Dimorphodon* Owen, 1859 – Dimorphodontidae; Pterosauria; Reptilia 37975

Note Details

Note: Identified as a Master record as part of the eMesozoic project.

Date: 25/11/2015 Kind: Project Notes Metadata: Yes No

References Details

Attributed To: *

Bibliographic Reference: *

Notes Summary

Note	Date	Kind	Metad...	Bibliographic Reference
1 Identified as a Master record as part of the eMeso...	25/11/2015	Project Notes		
*				

Other Names Description Geog. Status Relationships Other Citations Notes Objects Collection Index

Display Record 16 of 2423 pib2 Palaeontology - SuperCurator 20088

THE PROCESS: Transcription

Stratigraphy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Master - Jurassic, Middle Jurassic, Bajocian, Ravenscar Group, Cloughton Formation 22691

From Inf. terms Conf. To Inf. terms Conf.

Supergroup:

Group: Ravenscar Group

Formation: Cloughton Formation

Member:

Bed:

Details

Unit Type	Name	Geo. Determiner
*		Onshore

Bibliography:

Comments: Fomal Interpreter Name: Date:

Interpretation History

Lithostrat. History	Interpreter Name	Date	Bibliography
1 Ravenscar Group, Cloughton Formation			
2 (Undefined rank: Lower Estuarine "Series")			
3 (Undefined rank: Middle Deltaic Series)			
4 (Undefined rank: Middle Estuarine "Series")			
5 (Undefined rank: Middle Estuarine Series)			

Summary Chronostrat. Biostrat. Cultural Phase **Lithostrat.** Absolute Date Relative Date Other Strat. Related Strat. Tas


Display Stratigraphy record 2455 of 3576 pipb2 Palaeontology - SuperCurator 20088

THE PROCESS: Transcription

File Edit View History Bookmarks Tools Help
http://157.140...m=transcription x +
157.140.15.68/live/#project=mesozoic-workflow&form=transcription
Intranet BOXi Google Collections Managem... Mammal Species of th... BHL Lydekker irecruit Employee directory Quaternary Stratigraph... Radiocarbon Calibrati... Currency Converter ICZN BGS Lexicon of Named... ICS - Stratigraphic Guide DCP Collaboration Hub Purchase order form.pdf
Hi, Philippa

Transcription

Numbers
Registration number: PV R 2180 a
irn: 2397307

Multimedia
Select image


Record status
Record status: Active

Taxonomy
Existing/Master: [Master] Ophthalmosaurus icenicus Seeley, 1874 -- Ophthalmosauridae; Ichthyosauroidae; Meriamosauriform
[Master] Ophthalmosaurus icenicus Seeley, 1874 -- Ophthalmosauridae; Ichthyosauroidae; Meriamosauriform
Verbatim:

Stratigraphy
Existing/Master: Jurassic, Middle Jurassic, Callovian - Late Jurassic, Oxfordian, Anchole Group, Oxford Clay Formation
Verbatim:

Sites
Existing/Master: Near Peterborough, Cambridgeshire, England, United Kingdom, Europe
Verbatim:

Existing Description
Existing Description: Fragments of skull and mandible, vertebrae [43], rib fragments, coracoids, clavides, interclavides.

Type status
Type status:

Digitisation
Digitisation Status: Flag to curator
Digitiser Notes: Taxonomy only transcribed. Please transcribe other fields and then delete this note.

< > Record 1
Next OK Cancel

THE PROCESS: Transcription

File Edit View History Bookmarks Tools Help
http://157.140...m=transcription x +

157.140.15.68/live/#project=mesozoic-workflow&form=transcription

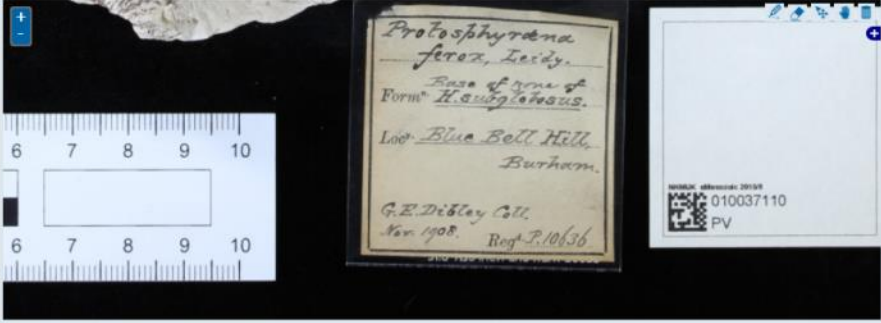
Intranet BOXi Google Collections Managem... Mammal Species of th... BHL Lydekker N recruit Employee directory Quaternary Stratigraph... Radiocarbon Calibrati... Currency Converter ICZN BGS Lexicon of Named... ICS - Stratigraphic Guide DCP Collaboration Hub Purchase order form.pdf

Hi, Philippa

Transcription

Numbers
Registration number: PVP 10636
irn: 5052311

Multimedia
Select image



Protosphyraena
ferox, Leidy.
Base of zone of
Form *H. subglacialis*.
Loc. Blue Bell Hill,
Burham.
G.E. Disley Coll.
Nov 1908. Reg. P. 10636

010037110
PV

Record status: Active

Taxonomy
Existing/Master:
Verbatim:

Stratigraphy
Existing/Master:
Verbatim:

Sites
Existing/Master: Blue
Between Watchet and Blue Anchor, Somerset, England, United Kingdom, Europe
Verbatim: Blue Anchor, Somerset, England, United Kingdom, Europe
Blue Bell Hill, Burham, Kent, England, United Kingdom, Europe

Existing Description
Existing Description:

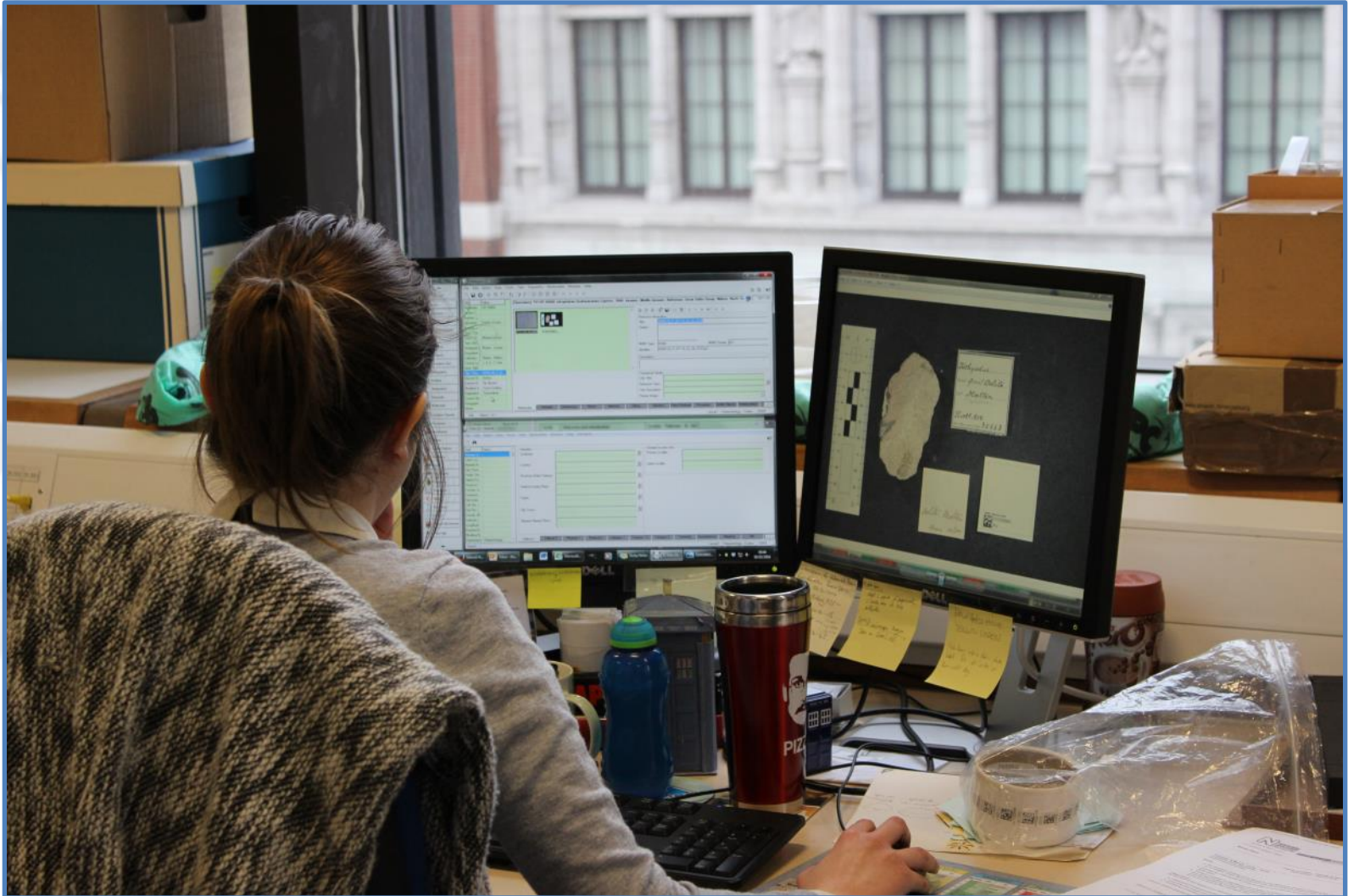
Type status

Digitisation
Digitisation Status: Ready for Transcription
Digitiser Notes:

< > Record 1

Next OK Cancel

THE PROCESS: Administration



WHAT HAVE WE ACHIEVED?

- High quality metadata to use on other projects, to assist with cleansing database, to publish, and to share
- Data to form the basis of research projects, such as those examining first and last occurrences of taxa over time
- Awareness of the issues and limitations of digitising palaeontology collections
- Workflows and Apps which can be further refined and developed

LESSONS LEARNED

- As we suspected, the cost of digitising vertebrate palaeontology specimens is high, ~£6/specimen
- The issues associated with digitising old, complex, historical collections are many
- Image-based transcription = useful
- Master lists?
- Talk to curators!
- Talk extensively to data managers and test the Apps
- **Spending time preparing the collections for digitising is very important!**

LINKS

The screenshot shows the homepage of the Natural History Museum Data Portal. The header includes the museum logo, the text "Data Portal", and navigation links for HOME, DATA, and ABOUT. A prominent message reads "Explore and download the Natural History Museum's research and collections data." Below this, statistics are displayed: 3.5M records, 41 datasets, and 18 contributors. A central search box is titled "Search the Natural History Museum Specimen Collection" and states that 2,841,486 of the museum's 80 million specimens are now available online. A world map shows specimen locations, with a search bar containing "E.g. Mollusca". At the bottom, five categories are listed with their respective counts: Zoology (1,173,796), Botany (627,286), Mineralogy (391,921), Palaeontology (366,656), and Entomology (281,827). A footer note indicates that the user is viewing a beta release of the portal.

<http://data.nhm.ac.uk/>

<http://www.nhm.ac.uk/our-science/our-work/digital-museum.html>

The screenshot displays a detailed specimen record for "PV R 720". The page title is "Data Portal" with navigation links for HOME, DATA, and ABOUT. The breadcrumb trail shows the path: Home > Data > Collection specimens > Specimens > PV R 720. The record includes several sections: "Classification" (Scientific name: *Iguanodon* Mantell, 1825, Author: Mantell, 1825, Family: Iguanodontidae, Genus: *Iguanodon*, Higher classification: Iguanodontidae), "Location" (State province: England, Country: United Kingdom, Continent: Europe, Higher geography: Europe; United Kingdom; England; West Sussex; Horsham), "Identification" (Name: *Iguanodon* Mantell, 1825), "Specimen" (Catalogue number: PV R 720, Collection code: PAL (Palaeontology), Sub department: Vertebrates, Other catalog numbers: NHMUK:catalogue:56004, Catalogue description: Posterior process of pubis of dinosaur), "Stratigraphy" (Earliest eon/lowest eonothem: Phanerozoic, Latest eon/highest eonothem: Phanerozoic, Earliest era/lowest erathem: Mesozoic, Latest era/highest erathem: Mesozoic, Earliest period/lowest system: Cretaceous, Latest period/highest system: Cretaceous, Earliest epoch/lowest series: Early Cretaceous, Latest epoch/highest series: Early Cretaceous, Earliest age/lowest stage: Berriasian, Latest age/highest stage: Berriasian, Group: Wealden Group, Chronostratigraphy: Cretaceous, Early Cretaceous, Berriasian - Berriasian, Lithostratigraphy: Wealden Group), "Record" (Occurrence ID: 3f16ce8b-6967-405e-908f-99f43044c2af, Modified: 2015-12-03, Created: 2009-12-02, Record type: Specimen), and "Images" (Two thumbnail images: a photograph of a specimen and a scan of a museum label).

ACKNOWLEDGEMENTS

- Everyone who has been involved in this project and/or provided advice of assistance – there are many of you! Includes, but not limited to Adrian Hine, Aileen Bevan, Alan Hart, Alfie Gleeson, Alison Longbottom, Andy Gale, Angela Milner, Axiell, Becky Smith, Ben Atkinson, Camilla Foster, Charlie Underwood, Chie Heath, Chris Hughes, Consuelo Sendino, Darrell Siebert, David Ward, Geoffrey Warrington, Giles Miller, Helena Toman, Javier Parraga, Jerry Hooker, Jill Darrell, Ken Johnson, Laurence Livermore, Lawrence Hudson, Lu Allington-Jones, Martha Richter, Martin Munt, Matt Woodburne, Michael Benton, Mike Howarth, Mike Sadka, Mike Smith, Nichola Nicholson, Pawel Szulga, Peta Hayes, Rachel Ives, Rebekah Smith, Richard Twitchett, Robin Hansen, Roula Pappa, Simon Wills, Stephen Hesselbo, Susan Evans, Susannah Maidment, Tim Ewin, Vladimir Blagoderov, Zerina Johanson and Zoë Hughes
- BGS Lithostratigraphy Lexicon
- Our **AMAZING** digitisers: Lyndsey Douglas, David Godfrey, Frankie Taylor and Anna Taylor

A large, stylized letter 'N' in a light blue color. The 'N' is composed of thick, rounded strokes. The top bar is horizontal, the left stem is vertical, and the right stem is vertical with a rounded top. The diagonal stroke connects the top of the left stem to the bottom of the right stem.

N

**NATURAL
HISTORY
MUSEUM**