

EDIT Workpackage 5 – Model 15 Detail

The taxonomist works in the Stuttgart Natural History Museum as a vertebrate Palaeontologist. The interview focussed around a single project; the study of a large fossil recently unearthed in southern Germany.

His work can be roughly divided as follows:

Curation	20%
Research	50%
Teaching	10%
Admin	30%

The following table describes the individual steps of the process model in detail.

Event	Starting trigger	In this field, projects are often initiated by the discovery of a new specimen. When compared with living sciences, the specimen pool for palaeontology is relatively small. Only a snap-shot of the specimens existing over the past ages are present. Because of this, the discovery of a new, significant specimens will be likely to prompt a review of current thinking. Reviews of existing taxonomic groups in the absence of new specimens are less common.
Activity	Collection activities/Fieldwork	The nature of anyone collecting trip will differ according to location. As Germany lacks areas where fossil rocks are naturally exposed, finds will tend to occur in quarries and other similar sites. Planned exploratory expeditions are rare. This will not be the case in other areas of the world; the taxonomist undertook a speculative field trip in Laos in 2005. Targeted collections, that is, the targeting of specific species for collection, is rare in this field. Usually an area will be noted as being likely to contain elements of the fossil record and will be thoroughly explored for that reason alone. Fossils can be taken by anyone, and there exists a healthy market for these items.
Action	Arrange permits & practicalities	The size and broad scope of archaeological expeditions mean that they are often arranged as joint venture between institutes. As such the work of arranging permits and practicalities will be carried out by partners in the country of the expedition wherever possible. The specimen are non-living so there is no possibility of CITES restrictions, however regional or national laws may apply to collecting activities and the removal of material.
Action	Conduct collection	The collection proper. The details of collections are covered in the ATBI modelling efforts.
Action	Mount specimens	Archaeological specimens are extremely fragile, and

		need to be protected against damage as soon as possible. This particular specimen was preserved in plaster of Paris in the field, once it, and the underlying rock, had been successfully removed from the surrounding earth.
Action	Transport specimens home	Specimens will be securely packaged and sent back via a road vehicle, or sea mail if required.
Activity	Search Literature	Describing the whole process of sourcing and acquiring literature
Action	Identify existing literature	The relatively small size of the field of Palaeontology means that a specialist in the field will already be aware of the scientific publications relating to the group under study. Following papers back via citations provides all the necessary references. External sources, search engines or library catalogues are not seen as necessary.
Action	Gather existing literature	Modern literature is accessible through the normal means – inter-library loans, or download from J-store perhaps. Particularly in this field however, much of the literature can be old and date back centuries. As a consequence, much is unavailable for loan and does not exist in digital format, so travelling to the hosting library is more common in Palaeontology. Colleagues can also be approached in the hope that they hold a copy of the paper in question.
Activity	Gather existing specimens	The process of sourcing and arranging contact with the specimens in order to examine them.
Action	Identify existing specimens	Largely found through citations in literature, and online museum catalogues where these exist.
Action	Gather existing specimens	The fragile nature of archaeological specimens means that transport is both expensive and carries a risk. It is more common for the taxonomist to visit the institute housing the specimen and conduct an examination there.
Activity	Examine specimens	The process of examination and theory development.
Activity	Prepare specimens	In this field, preparing the specimen for examination can be a lengthy process. Both the plaster of Paris, in which it was encased for safety, and the surrounding rock, in which it has been embedded for millennia, have to be slowly and carefully removed. Indeed, the process of revealing a fossil from its substrate rock is a highly specialised task that is undertaken by dedicated experts. In all, the task of exposing the fossil can take up to two years.
Action	First visual examination	First, undertake a broad, general examination, focusses on the major characters. In vertebrates, these tend to be found in the skull and the cranial skeleton.

Action	Detailed visual examination	<p>Consists of closer examination using the light and stereo microscope. Detailed structures can be maintained through the mineralisation of fine bone.</p> <p>Detailed examination also involved photography, the production of technical illustrations, and the taking of precise measurements. The production of technical illustrations is seen as probably the most important element of the whole research.</p>
Decision	Further analysis?	A decision as to whether further analysis is required.
Action	Further analysis	<p>SEM is available though has not been required so far. Other examinations can include analysis of the chemical composition of the surrounding rock.</p> <p>Further analysis can also include phylogenetic analysis of the specimen characters. PAUP and MACLADE are commonly used for this</p>
Decision	Assess theory	<p>A continual event throughout the examination; the regular assessing of the emerging theory and decision as whether the examination should continue.</p> <p>The main question to answer is; is this a new species or something seen before? The results of the phylogenetic analysis are particularly important when answering this questions, In either case, a paper will be prepared. For this particular project the specimen itself is extremely noteworthy even if the species it represents is already described.</p>
Activity	Apply nomenclatural rules	A broad category representing the application of the rules of nomenclature.
Action	Resolve type specimens	Type specimens are assigned to each group, according to the rules of the ICBN. Even in the case of the examination of a single specimen the rules will be applicable.
Action	Resolve nomenclature	Nomenclature is resolved for the type specimens in each group. In this case, either the specimen will be the type of a new species, or will fit into a pre-existing group.
Activity	Prepare paper	Broad activity referring to the process in which a scientific paper is compiled and published. The most common vehicle for publishing is the Journal of Vertebrate Palaeontology, one of the largest in a limited field.
Action	Compile manuscript	<p>Compile the manuscript, according to the editorial guidelines of the journal, using MS Word. Papers will include the standard requirements of a taxonomic review, and also other items such as tables, images, distribution maps, and any other information or analysis appropriate to the study.</p> <p>Images are processed using Adobe Photoshop and Illustrator.</p>

Action	Friendly review	An informal review carried out by colleagues prior to any formal submission of the paper. Manuscripts are distributed electronically.
Action	Revise paper	In the light of the reviewer's comments, carry out any revisions to the paper that are felt necessary
Action	Submit to journal	Submit the manuscript to the journal in accordance with the editorial guidelines. Many journals in this field prefer postal submission of papers so email can sometimes not be used.
Decision	Manuscript review	The manuscript will be peer-reviewed by a number of independent scientists. The outcome of this review can be: <ul style="list-style-type: none"> - Minor modification - Major modification - outright acceptance (rare) - outright rejection (rare)
Activity	Curation activities	
Action	Label specimens	Labels are either hand-written, or printed if a large number are required, and glued to the prepared specimens. This task is undertaken by the curator of the collection.
Action	Return loaned specimens / send out paratypes	Loaned specimens tends to be returned by hand when the opportunity arises.
Action	Place specimens in local collection	In general cases, specimens will indeed pass into the collection. In this case, the specimen will likely warrant permanent display in the museum, where it will of course remain part of the collection.
Action	Update collection database	This is undertaken by the collections manager. In this institute the collections database exists as ledgers.

Palaeontology is a field with a long and continuing tradition of involvement with the amateur community, and many specimens have been discovered by non-professionals and also by accident. There is no obligation to report any such finds, though most responsible amateur collectors do so, and donate their discoveries to the suitable institute.

There is also much collaboration with other related sciences, such as that of taphonomy, the study of the process of decomposition over time.

Wish-list :

Scanning and online availability of old literature