

# The 'Dutch approach', or how to achieve a second life for abandoned geological collections

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This paper is part of a 'diptych' describing the 'life-cycle' of geological collections from Dutch universities against the background of developments in education and research. Whereas this paper focuses on the development of the collections, the rise and decline of their use in research and teaching and the process that finally led to combined, national effort to decide on the future of these collections, Leo Kriegsman's paper will discuss the process of making choices which collections will be kept for the future and how to deal with selection and de-accessioning.

The worldwide shift from the field to the laboratory in both education and research, combined with massive reorganisations, led to many orphaned collections, totalling some two million objects.

Sponsored by the government, the five oldest Dutch universities engaged in a collaborative action to tackle this problem with the aim to improve the overall quality and accessibility of the collections, as well as to intensify their present and future use through selection, de-accession, collection mobility, or even disposal. Some experiences, pitfalls and recommendations will be discussed.

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## Introduction

Ever since the late Renaissance, natural history, including geological, palaeontological and mineralogical samples, can be found in cabinets of curiosities all over Europe. Usually they are referred to as 'fossilia'. Most universities however did not

own natural history collections of any significance until the late eighteenth century, apart from their botanical gardens and anatomical cabinets. These '*naturalia*' and '*fossilia*' were kept in cabinets of curiosity. Most of these early cabinets were the private property of the nobility and they were exclusively accessible to the owners and their carefully selected guests. During the second half of the sixteenth century we gradually see an intellectual elite establishing their own cabinets. Some of those '*naturalists*', like Ulisse Aldrovandi (1527-1605), become professors. Aldrovandi donated his collections to the University of Bologna; where today, his collections are beautifully displayed in the restored Palazzo Poggi, Bologna's magnificent university museum. Of a more private nature are the collections of *materia medica* of many pharmacists and medical doctors. Famous examples are those of the Neapolitan pharmacist Ferrante Imperato (1550-1631) or Berhardus Paludanus (1550-1633) in Enkhuizen, The Netherlands. Both used their collections, which existed of '*fossilia, naturalia & artificialia*', for their own studies and for the education of their apprentices.

Leiden University was one of the earliest universities North of the Alps to collect and keep specimen for the education of their students. In 1587 Leiden decided to follow the example of Pisa and Padua and develop its own *Hortus Medicus*. Paludanus was invited to come to Leiden to become the first Director of the Garden and to take

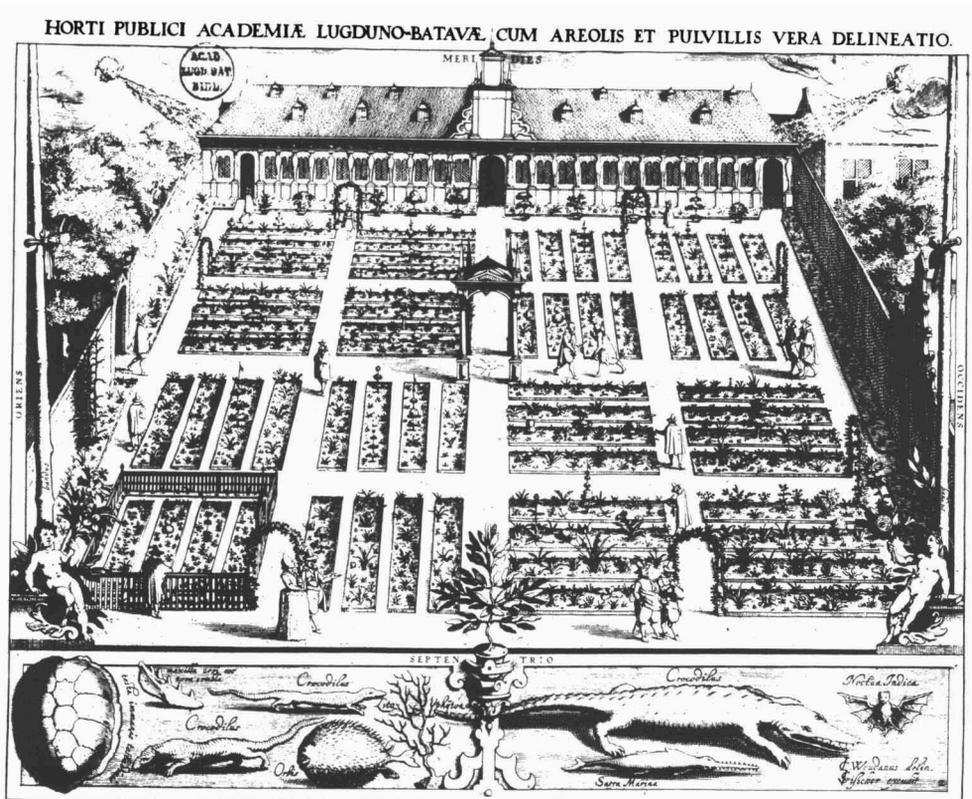


Fig. 1. Ground plan of the garden of Leiden University in the 17th century showing Ambulacrum and curiosities.

charge of its arrangement. The Curators asked him to bring along his collections "... for the promotion of scholarship and education, as well as the honour of the university ..." (Molhuysen, 1913, pp. 124, 192) (Fig. 1). Only a few years later – in 1593 – Leiden University built its famous *Theatrum Anatomicum*, where preparations and skeletons of human and animal origin were kept; in the winter of 1599 the *Ambulacrum* was built against the southern wall of the Botanical Garden. During the summer months, a number of so-called 'fossilia' was kept in the *Ambulacrum*, whereas it served during winter to keep plants from southern, mostly Mediterranean origin (Tjon Sie Fat, 1992). These activities illustrate how much importance was given to objects as source of information, and how much collections contributed to the standing of the university. For a general overview of the history of university collections, see also Boylan (1999), Lewis (1984) and Lourenço (2003).

In The Netherlands, during the seventeenth century, most natural history collections were the private property of learned gentlemen, whose appointment as university professor often depended on the quality of their collections. To some extent, these collections – often containing both minerals and fossils – survive up to the present day in the collections of universities. The close connection between mineralogy and pharmacy is evident in the *materia medica* and fossils were often included in the comparative anatomy collections. Today, probably the most important surviving early natural history collection in The Netherlands is kept at the Geological and Mineralogical Cabinet of Teylers Museum, Haarlem. In the years 1782-1826, its first keeper, Martinus van Marum (1750-1837), devoted much time and money in amassing a considerable collection *fossilia*, including crystal models by Romé de l'Isle and the Abbé Haüy, as well as the famous *Homo diluvii testis*, a fossil found and described by Scheuchzer (1726) as the sinner that was rightfully drowned by the biblical flood. Only in 1811 Georges Cuvier (1814) correctly identified it as an amphibian, later named *Andrias scheuchzeri* Holl, 1831, a giant salamander.

When we think about these early 'geological' collections, it is good to keep in mind, that according to The Shorter Oxford English Dictionary the word 'geology' is first mentioned in 1735, whereas the first entry of 'geology' in the *Encyclopaedia Britannica* had to wait for its fourth edition in 1810. In 1815 William Smith (1769-1835) published the first geological map that was ever made of country (*A Delineation of The Strata of England and Wales with part of Scotland*). He was also the first to recognise that fossils were not just beautiful and curious stones, but that they could be used for the identification and relative dating of strata (= stratigraphy). His collection is now at The Natural History Museum, London.

It is important to keep this in mind when we look at our old, historical collections after all such collections are the material evidence of the birth of geology as an independent discipline. Finally, a university degree in geology was not possible until the second part of the nineteenth century.

### **The emergence of geological university collections in The Netherlands**

The first formal reference to geological collections for educational purposes in The Netherlands is to be found in the post-Napoleonic law on higher education ("Organiek Besluit" 2 augustus 1815). This law prescribes that each university should

have – apart from a library – seven 'cabinets' on subjects like anatomy, comparative anatomy, zoology, botany, geology, physics and astronomy. The establishment of a 'geological cabinet' heralds systematic collecting of palaeontological, mineralogical and geological samples, and of casts and crystallographic models for educational purposes. Many, if not most, of the objects in these collections were in some way or another related to research. However, research as such was not formalised until the 1876 Law on Higher Education ("Wet tot Regeling van het Hooger Onderwijs", 28 april 1876), when it was recognised as one of the two academic core-tasks.

As a result of this law, chairs in geology were established at the universities of Groningen (1877), Leiden (1878) and Utrecht (1879); mining engineering was taught from 1864 at the Technical Highschool in Delft. During the first decades, the number of students was small, but there were funds for the formation of collections. The geological collections of the National Museum of Natural History were entrusted to the Professor of Geology at Leiden, Dr Karl Martin, thus the 'Rijksmuseum van Geologie en Mineralogie' was created (see Winkler Prins, this volume). Gradually two types of collections emerged:

Systematic collections for education in specific subjects (mineralogy, petrology, geology, palaeontology, stratigraphy). Photographs and architectural drawings show that these collections were kept in the museum and were organised in cabinets according to the method used at the time. The Systematic Palaeontological Museum in Utrecht, for example, was kept in drawers, which were organised in taxonomic order. Objects were often purchased from renowned houses like Kranz and Stürtz, which flourished in the second half of the nineteenth century, or they were obtained during field trips or through exchange.

Regional collections for research. Material was usually collected in the field during field trips to classical locations or as a result of participation in exploratory expeditions.

Around 1900, some major scientific expeditions to the colonies were organised, aiming at surveying the natural treasures (flora, fauna, geography, geology and minerals) of the hitherto unknown interior of these territories. In Indonesia, the "Dienst van het Mijnwezen" (Geological Survey) was often charged with the organisation and logistics in the field. Often a duplicate collection was made to be kept overseas in the colony of origin. On their return to Europe, the collections could be split up for further research and distributed over the universities for further research along the lines of their specialisation. Illustrating the international character of research, collections could also be sent to colleagues from abroad.

Gradually the number of students increased as a result of the growing demand for geologists and mining engineers. These students would participate in the expeditions mentioned above and subsequently contribute to the study of the material as part of their master's or Ph.D. degrees. In this way, each student would make his 'own' (student) collection as a result of field training, which would be added to the collections of the faculty, when the student left the university. The growing demand for geologists and mining engineers was reflected in the increasing number of professors and staff and, in 1929, in the establishment at the University of Amsterdam of the fourth fully equipped geological institute.

Professors continued to organise expeditions and extended field campaigns to areas of their specific scholarly interest. The character of these expeditions, however,

changed as a result of a more active participation of students. This, combined with the increasing involvement of students in the research programme of the department, led to numerous collection-based publications and Ph.D. theses. Over the years, the number of collections grew considerably.

### The roaring sixties

This practice continued more or less unaltered until the 1960s. By then, The Netherlands had four fully equipped geological institutes (Amsterdam, Groningen, Leiden, Utrecht) for not more than some 50 first-year students, and one school for mining engineering (Delft) with some 15 new students each year.

In 1965 this already luxurious situation became untenable when the Free University of Amsterdam claimed – and got – the right to establish its own geological institute. The four older universities felt that they could not stay behind and claimed more funds for modern equipment and extra chairs. This more or less coincided with a number of rather independent developments that had an enormous impact on the universities as a whole:

- i an explosive growth of students and, consequently, of staff and housing;
- ii budget cuts for higher education;
- iii democratisation and management reform;
- iv reorientation on research and education;
- v new expensive and voluminous laboratory equipment.

In the Earth sciences this led to the introduction of new fields like geophysics and geochemistry, and a marked shift in research and education from the field to the laboratory, from macro to micro, from description to experiment. In the wake of this process it became fashionable to play down the status and importance of collections. It became fashionable to say: “we have by now sufficiently mapped the world and descriptive sciences are from now on out of date.” Moreover, driven by a dip in economic growth, these developments brought the Government to initiate the process “Herstructureren Aardwetenschappen” (= Reorganisation Earth Sciences). This was the first initiative for a reorganisation on the national level of an entire discipline. As a student in geology at the University of Amsterdam, I witnessed this process and, in fact, actively participated in it.

In this paper, I will discuss the consequences these developments had for the collections. In short, these were disastrous, as there was no general plan for the collections and they were hardly mentioned during the entire process, if at all. In other words, the fate of the collections was entirely left to the personal engagement of a handful of dedicated individuals. The entire process lasted from 1967 to 1979 and resulted in the following situation:

- Amsterdam: the faculty of the University of Amsterdam was forced to merge with the new faculty at the Free University, which only accepted a marginal part of the collections. The remainder (well over 1,000,000 objects) was stored in a basement of which about half was given on loan to the Geological Museum of the Amsterdam Zoo (Artis).
- Groningen: the faculty was closed down and gradually, the university disposed off most collections; some of them were transferred to what is now Naturalis.

Thanks to the efforts of an emeritus Professor, a core-collection of about 30,000 objects was kept, including historical objects collected during the eighteenth century by the comparative anatomist Professor Petrus Camper (1722-1789).

- Leiden: the faculty was closed down and staff split up, some moving to Utrecht (together with their collections), while others were transferred to the National Museum of Natural History (now Naturalis), also in Leiden. Most collections were saved due to the long-standing and close link between the faculty and the museum.
- Utrecht: a new building on campus was necessary to house the new faculty, which grew considerably due to the merger with part of the former Leiden staff. From the beginning, however, the building was too small and as a result many collections had to be left behind in the former building. (The initial plan was that they would become the nucleus for a regional natural history museum, together with the orphaned collections of the Department of Zoology. This never materialised.) More than a decade later, part of the collections was handed over to the Utrecht University Museum, whereas the remainder was offered to local museums or disposed of after Naturalis had made a selection.
- Delft: survived this round of reorganisations unharmed.

After the dust of the reorganisation had more or less settled, well over two million geological samples were left as orphans, some still in the odd corners of their institute, others in abandoned laboratories or temporary storages. Although the reasons why such collections became 'orphaned' vary, the results are always the same; gradually the interest, attention and care diminished, the collections were moved to the cellar or a remote corner of the attic, or were just left behind. Sometimes, a collection was split into different parts and the documentation became separated from the collection. Apart from 'psychological' (who wants to continue the work of his predecessor?) and political reasons (the abolition of the subject due to reorganisation and budget cuts), the most important factor was probably the change in research methodologies and techniques; a shift from the field to the laboratory, from description to experiment. This shift was also echoed in a decrease in the use of teaching collections.

### **A quarter century of despair**

Most staff members were happy to survive this upheaval and to get back to work. They had lost interest in the collections and struggled to survive, as there were more changes and reorganisations to come. Nevertheless, there were a few initiatives, like the above-mentioned establishment of a geological museum at the Amsterdam Zoo and the failed attempt in Utrecht to transform the former Geological Institute into a regional natural history museum. Although the latter never materialised, it did cause pressure on the Board of the University Today, a selection of both collections is housed at the Utrecht University Museum, while parts have been transferred to Naturalis.

In 1984, the keepers of collections of most Dutch universities joined forces and established LOCUC. Their first and most effective action was to compile the first comprehensive inventory of existing university collections (LOCUC, 1985). The Ministry of Culture sponsored the initiative and published the report. A total of 224 collections were identified, ranging from huge ones of well over a million objects to small ones

consisting of just a handful of items. Those in charge were asked to assess the future of their collections. Eighteen were reported as 'threatened', among them the geological collections from the five old universities. Embarrassed by the outcome of this report, the Ministry of Culture asked the State Advisory Committee on Museums to look into the matter and to come forward with suggestions. Their report (Rijkscommissie voor de Musea, 1986) confirmed the situation and made recommendations for the future of each of the collections.

The result of these activities was that both Government and universities felt uncomfortable with the situation. Although massive loss of the collections was prevented, there was still no real solution. It is interesting to further explore the reasons why these efforts had little effect. Apart from familiar arguments such as 'low priority' and 'lack of money', two things really seemed to matter. First of all, although the Minister of Education and Science was responsible for the universities and hence for their collections, the Minister of Culture claimed the overall responsibility for cultural heritage. However, the latter refused to pay for collections that belonged to the other ministry. In turn, the Minister of Education and Science argued that he could not do anything either, because the responsibility had been claimed by the Ministry of Culture. A more practical reason was that the geological collections were just too big and contained too many objects, which made it impossible to find one single solution for all collections and objects.

### **A change in climate**

Funding of Dutch universities is based on output in research and teaching. This system does not take into account the responsibility of the classical universities to maintain their museums and collections, old libraries, botanical gardens, and monumental buildings, in other words, their academic and scientific heritage. Furthermore, the so-called classical universities are also responsible for a range of small (and therefore costly) disciplines, like Icelandic language, history of science and ethnomusicology; in other words, subjects with just a handful of students per year, whereas we all agree that there should be at least one place to study them. As a result, these universities find it increasingly difficult to cope with pressures to invest in modern equipment in order to keep up the competition with more recently established universities, which are not faced with such traditional responsibilities.

The cultural responsibilities of universities are explicitly mentioned in the 'Magna Charta' of Universities. [The 'Magna Charta' was signed by more than 250 rectors of European universities in Bologna in 1988 (see [http://www.unige.ch/cre/activities/Magna%20Charta/magna\\_charta.html](http://www.unige.ch/cre/activities/Magna%20Charta/magna_charta.html)).] These include the care for academic heritage, both tangible and intangible.

At the international level, four initiatives focusing on academic heritage have recently been taken:

1. In 1998, the Council of Europe accepted a Recommendation (1998, No. 1375, Document 8111) focussing on the vulnerable position of scientific collections. The Council distinguishes "incidental" collections. "These are collections ... owned by persons or bodies (like universities) whose main or major activities are in areas other than collecting or caring for collections." Since incidental collections "... are

often subject to pressures, which the owner is not able to stand against..." it is recommended to ask member countries:

- "to implement comprehensive legislation designed to encourage the non-dispersal of selected incidental collections;
  - to establish a general scheme to give assistance ... to owners of collections ... when there is a demonstrated need for this."
2. In 1999, the Council of Europe initiated the project 'Heritage of European Universities', aiming at creating a *route* of historical universities in Europe (Sanz *et al.*, 2002);
  3. In 2000, 12 of the oldest and most renowned European universities established the network 'Academic Heritage and European Universities' – now known as 'Universeum' (see Brmer & Wegener, 2001) – and signed the 'Declaration of Halle' (see Appendix: Declaration of Halle, 2000)
  4. In 2001, the International Council of Museums (ICOM) established an International Committee on university museums and collections, UMAC (see: <http://www.icom.org/umac>).

In The Netherlands, the Ministries of Education and Science and that of Culture were merged in 1995, thereby theoretically placing the responsibility for academic heritage at the national level in one hand. The classical universities seized the opportunity and drafted a rescue plan (de Clercq *et al.*, 1995) in which they claimed funds for their endangered collections. In reply, the Ministry ordered a detailed inventory of academic heritage under the care of Dutch universities and related scientific institutions (Rijksdienst Beeldende Kunst, 1986). This survey confirmed that the five old universities (together with the national museums in Leiden) keep the large majority of Dutch academic heritage. Many of these collections still serve as active resources for teaching and research. It is likely that at least part of it will continue to do so. Furthermore, these collections act as unique and irreplaceable historical, cultural and scientific records, and contain material of national and international importance. We may call this our 'scientific heritage.' In many cases, this material is kept under poor conditions and conservation is urgent. The survey made two additional points:

- Not all collections are worth keeping.
- The intrinsic significance of a collection is not determined by the fact whether, or not it is being used within the Faculty; in other words, 'orphaned collections' can be of great scientific importance!

These observations, in combination with the accumulation of problems around collections, political pressure, growing awareness of the unique and often irreplaceable resources they contain, and of the cultural role and responsibility of universities towards their heritage, led to the conviction that action had become inevitable. This subsequently led to the establishment by the five old universities of the 'Stichting Academisch Erfgoed' (Foundation for Academic Heritage; c/o Bureau Communicatie, Universiteit van Amsterdam, Postbus 19268, 1000 GG Amsterdam). In 1996, the Ministry of Education, Culture and Science decided to sponsor this initiative with a once-off budget of 6 million Euros for the years 1997-2000, provided that the universities would contribute an additional 9 million. This budget was meant for the improvement of the most important or endangered university collections in The Netherlands. The Mondriaan Foundation, Amsterdam, administered the grant. One million euros were allotted to each of the five participating universities, whilst the

remaining one million was divided among the three national projects, the orphaned geological collections, the medical collections and the botanical gardens. In each case all relevant university collections in The Netherlands were involved in the project

University museums, in particular those with natural history collections are increasingly under pressure to scale down the size of their collections, or even to dispose of them entirely (AAM Position Statement, 2003). This pressure is triggered from both inside and outside, and the result of the high cost of maintenance, the decrease in the use of teaching and research collections and the growing conviction that reduction of collections is possible without irreparable loss of information. Keepers of such collections find themselves caught in the dilemma, wanting to preserve and study as much as possible of the collections they and their predecessors have amassed over the years, but being unable to save it all. Performing reduction implies selection and subsequent disposal, in other words the risk that valuable material will get lost. This particular dilemma is well described by Thomson (2002).

### Methods & Procedures

Two of the national projects – the geological and the medical collections – focussed on the improvement of the collections by raising the profile through reduction and collection mobility. All involved were thoroughly aware of the fact that the sheer number of objects was such that it was impossible to take care of all of them in a proper way. The collections contain a large number of duplicates, for example in the mass-produced medical instruments of the nineteenth and twentieth century. In addition, there were collections of little or no use for ongoing research and teaching in the faculties, in particular the geological student collections and the 'orphaned collections' that were left behind after discontinuity of specific fields of research (e.g., vertebrate palaeontology), the ceasing of the use of specimens in teaching (e.g., anatomy, pathology), or even the closing down of entire faculties (dentistry, geology). In other words, de-accessioning, collection mobility and even disposal have become inevitable instruments in the management of scientific collections.

Therefore, the aim of the project was twofold:

- to improve the overall quality of the collections through specialisation, the development of 'collection profiles', selection and disposal (a possible reduction of 35-50 % was estimated); and
- to enhance the use of the collections or to give them a 'second life' by physically handing over the collection to a new user ('collection mobility' and the use of IT).

More or less the same procedures were followed for each of the two national projects.

1. A working group composed of the keepers of collections was set up, with an independent chair, that understood both the subject and the role of collections. For the geology project, the project coordinator did most of the work and was in charge of communication, development, etc;
2. In order to be able to cope with the enormous number of objects, it was decided to work on a higher level of abstraction and the concept 'sub-collection' was introduced;

3. An inventory of the sub-collections, including general information, type, origin, a valuation of quality, and suggestions for possible future use and action, was entered into a database;
4. Legal status was carefully checked. Sub-collections on loan, but no longer used, were returned;
5. A 'protocol of de-accessioning' was developed, outlining the conditions under which collections should be offered to new owners and how to decide in case more than one candidate would be interested. Institutions that intended to keep the collection together and use it for future research were given a higher priority than those that only looked for exhibition material for local museums, even if this meant that the collection would go abroad;
6. Second opinions by consulting specialists from the national museums, the Mondriaan Foundation, the Netherlands Institute for Cultural Heritage, among others were sought;
7. The Boards of universities were asked to approve these lines and procedures and to act accordingly.

### **Deciding on the future of the geological collections**

A special feature of the geological project was that the collections of the former Geological Institute of the University of Amsterdam had been left orphaned for many years. Earlier efforts to hand over the entire collections to a new owner had failed. These efforts that aimed at keeping all collections together in order to maintain the internal logic had failed because potential new owners could not afford taking all collections and were only interested in smaller parts. We had to be realistic and therefore went for the 'second best' solution, which meant splitting up the collections in 'sub-collection' and offering those to potential new owners. We decided to use the concept of 'sub-collection' in a very pragmatic way. In our view a sub-collection can be any group (between 10 and several 1000s) of objects with an internal logic, which is readily understood by the professional field. In the case of geology, sub-collections are usually identified by the name of the collector, the year, a geographical site or a subject, generally a combination, for example 'Subbetic Zone, Sierra de Maria (Spain), de Clercq, student-collection, 1968'.

Because of the complexity of the matter and the size and novelty of the project, two phases were envisaged:

- inventory, search for new owners and decision-making
- execution.

The first thing that had to be done was to draw up an inventory of the sub-collections. Together, the universities of Amsterdam, Delft, Groningen, and Utrecht kept well over two million geological samples. Working along these lines, these could be grouped into 842 sub-collections. The majority of the 'threatened collections' belonged to the University of Amsterdam, where the faculty had been closed 25 years ago. About half of that collection was on permanent loan to the Amsterdam Zoo, Artis for its Geological Museum.

These data were entered in a database together with useful general information, like origin, owner, legal status, type, condition and a valuation of the scientific quality and suggestions for possible future use and action. The assessment of the quality of

the collections was given in four categories (A-D), earlier developed by the Ministry of Culture (Krikken, 1997).

We could distinguish three categories of sub-collections of roughly the same size:

1. Those, which remained in use by the faculty for education and research.
2. Those, which no longer played a role in present-day education or research, but were considered of high scientific and/or cultural importance and should therefore be kept as 'academic geological heritage' (the 'orphaned collections').
3. Those, which were considered to be of insufficient, or no relevance.

Before offering the collections to potential new owners, we developed a 'protocol of de-accessioning', outlining the conditions under which collections could be offered to new owners and how to decide in case more than one candidate would be interested. We also carefully checked the legal status. Material on loan, but no longer used, was returned. Priority was given to institutions that intended to keep the collection together and use it for future research, even if this meant that the collection would go abroad. Material collected in a specific country would first be offered to the geological survey of that country. Basically, the collections were offered for free (including all relevant information); only transportation etc. had to be paid by new owner.

Subsequently, the database with the sub-collections mentioned under 2) and 3) was put on the website of the Technical Museum of the University Delft, and then offered to a broad range of institutions, including the major universities and natural history museums, both in The Netherlands and abroad and to all the geological surveys or equivalent institutions in countries of origin. These institutions were selected according to the origin and composition of the material, and the characteristics of the (potentially) receiving institute. Formal letters were sent to the directors of each of these institutions, inviting them to express their interest, whereas personal contacts were used to give this process the widest possible publicity.

Although some reactions from abroad were received, the final result was not impressive. Nevertheless, it was encouraging that the geological surveys of Indonesia, France and Spain expressed interest for material collected during field campaigns in their respective countries. In fact on the 28th of April 2003 the formal transfer took place of collections from the University of Amsterdam to the Geological Survey in Indonesia. However rewarding it is that some collections will indeed get a second life in its country of origin, we must face the fact that only a small number of collections will in the end gain a second life in this way.

This left the question of what to do with the remainder, mainly at the University of Amsterdam. The easiest part were of course the collections, which remained in use by the faculty (category 1), and the collections judged of little importance (category 3), notably those with poor or no documentation and the so-called the 'student collections'. It was decided that these could be disposed of after a rather superficial selection of objects that could be used for exhibitions or for educational purposes, for example in schools, etc., was carried out.

### **Academic geological heritage**

The orphaned collections belonging to the 'academic geological heritage' (category 2) were serious matter of concern. These collections are judged of national and even

international quality because they had been extensively studied and the results were published, often in internationally renowned journals. Many of these collections can be regarded as reference collections in their own right and quite a few contain type specimens; they embody our scientific heritage. Although decline in interest in the collections is no measure for their potential value, the question remained whether such collections should be kept and, if so, by whom. A frequently voiced, but rather superficial and unsatisfactory answer to this question is, "a collection is only worth keeping if someone is willing to pay for it." However, we must acknowledge that as museum-professionals we have not produced a more satisfactory answer so far, nor the necessary tools to tackle this archival function, and, therefore, we lack the necessary support and funds. In practice, the answer to that question is largely dictated by the question who will pay. In this respect, university collections all over the world suffer from the fact that they are funded on the basis of output of research and teaching, meaning that there is no regular funding for the scientific heritage. Like many other countries, The Netherlands also lacks a general policy regarding scientific heritage. What happens is largely left to the initiative of the 'field'. It is therefore fortunate that our National Museum of Natural History, Naturalis agreed to participate intensively in discussions leading to the final outcome. Generally speaking, efforts were made to strengthen already existing collection-profiles both in the geological collections of the universities involved as well as other national history collections. During the course of the process, second opinions were sought among others from consulting specialists from universities and national museums, the Mondriaan Foundation, the Netherlands Institute for Cultural Heritage (ICN) and the Inspectorate of Cultural Heritage of the Ministry of Education, Culture and Science. Finally, the approval was sought – and found – from the Boards of universities to act accordingly and to start with the second phase, the execution.

In this process, the National Museum of Natural History Naturalis played a very important role in deciding to store all remaining orphaned collections of national importance for which we did not find a new owner (aiming at a future 'National Geological Archive'). Selection criteria were set up in close collaboration with the staff of Naturalis. Some collections will be kept in their entirety given their provenance, while removing bulky objects and concentrating on thin-sections will reduce other collections. In other cases keeping only a representative selection was deemed satisfactory (see Kriegsman, this issue).

This exercise, which led to an overall reduction in volume of around 30-35 %, is evidently both expensive and time-consuming and can only be carried out by well-trained geologists. The job was cleared within the fixed budget by 31st December 2002. Formal handing over of the collections to their new owners and users was scheduled for 28th April 2003. Naturalis will take care of registration and access to the collections according to its own standards. Most material will be described at the level of sub-collection or coherent unit, and only type material will be described at the object level. The results will be published in order to inform the international geological community on the whereabouts of these collections.

### Experience, pitfalls and recommendations

Thinking about selection and de-accessioning is a neglected aspect of the museum profession. Disposal (= the permanent removal of an object from a museum's permanent collection, involving the intentional termination of ownership; de-accessioning is the process that leads to the decision) is generally considered 'not done' in any well-managed 'normal' museum, where collection policies aim at adding objects felt to be missing. This is, and should be, fundamentally different in many university museums and collections, which gather objects primarily as 'tools' for learning and research (de Clercq & Lourenço, 2003). However, this does not legitimate the disposal of all collections after they cease to be used. On the contrary, many objects derive their significance from the fact that they have been studied and the results published, whereas others have become useless (e.g., demagnetised palaeomagnetic samples). In other words, thinking about selection and disposal ought to be a natural part of the professional practice in university museums and collections. In fact, curators are continuously faced with the question as to which objects or collections should be kept for future use, because scientists' inquisitiveness is driven to new 'hunting grounds' once their questions have been solved. Ideally, selection and subsequent de-accessioning should be the final stage of each research programme, and what is kept is to be regarded as scientific heritage. This implies an archival function, but this function has not yet been thoroughly defined. We can learn tremendously from the experience of professional archivists in this respect. Archives are meant to be kept and used. We must therefore also think clearly about the potential use of the collections that we want to keep. In the case of type collections (and, to a lesser extent, reference collections), this is evident because of international conventions on the matter. But what about the potential use for new fields yet unexplored? These can be purely scientific (e.g., the discovery of a new species), commercial (e.g., ore reserves), but also highly practical. For example, samples from abandoned Cornish coal mines were used for comparison in a study of present day contamination of groundwater. Finally, collections also have a historical dimension and they can tell us about the history of research and teaching. Potential users of our collections are therefore scholars, students, historians of science and industry. Ideally, these considerations have to be taken into account whilst performing an exercise such as that of the 'Stichting Academisch Erfgoed'. This should not only be true for the participating universities, but also for potential new owners.

Generally speaking, all involved agreed that this major operation worked out well and can perhaps serve as an example. It is satisfactory that new owners are willing to take care of such a significant number of orphaned collections, pay for their maintenance and are eager to use them, in other words, to give them a second life.

However, there are pitfalls. The most important relates to the consequences of the division into sub-collections. For 20 years, we had failed to find a solution for collections as a whole and it is obviously impossible to take one unique decision on some two million individual objects. Therefore, reducing the total to 842 sub-collections was an essential step in tackling and solving the problem. However, it turned out that we did not always pay sufficient attention to the collection as a whole, to its context or to the added value of the sum of collections. For example, due to reorganisations at one university, a small specialist group was closed down and its vertebrate palaeontology

collections orphaned. The evolution of island faunas was one of their specialisations (for which the group was known worldwide) and their collections contained material from all over the world. Registration and organisation of these collections was based on the location of origin. However, the unique quality of the collection was that it enabled comparison of identical anatomical components from different sites, which in turn allowed investigation into the functional adaptation to a variety of environments. Splitting up such a collection according to the locations of origin evidently destroys its internal logic and relevance. In hindsight, we must acknowledge that insufficient attention was paid to such situations. The example illustrates that it is not at all evident who should raise such questions, neither in which stage of the process that should have been done, nor what action was required and who would have been in the position to take decisions.

### Conclusions

As the project now has come to an end, some general reflections are due:

- The project served its purposes because all involved:
  - were prepared to look at their own collections against the background of the national (and indeed international) academic geological heritage;
  - were interested to raise their profile through raised the profile of participating institutions as a result of specialisation & collection mobility;
  - see collaboration as a way to cope with basic problems like shortage of time, staff, money, space, etc.;
- The chosen methodology worked well because:
  - the working group in charge of co-ordination included representatives of all relevant collections involved;
  - had an independent chair and an efficient project coordinator;
  - obtained a mandate to take decisions;
  - achieved commitment by faculties and keepers;
  - sought second opinions;
  - obtained crucial involvement of national museums and other relevant institutions; and
  - worked on the basis of an agreed 'protocol of de-accessioning'.
- The concept of sub-collections proved essential to break a 25 year deadlock.
- The exercise as such:
  - led to an overall reduction in volume of around 30-35 %;
  - is evidently both expensive and time-consuming;
  - can only be carried out by well-trained geologists;
  - the job was cleared within the fixed budget and by 31st December 2002.
- Decision making takes much time.
- Approaching potential new owners and reaching agreement on the conditions of transfer takes even more time.
- 40 % government sponsoring triggered > 60 % own input.
- Collaboration was crucial for success 'Dutch Approach'.

Generally speaking, all involved agree that this major operation worked out well and can perhaps serve as an example. The willingness to look at one's own collections

against the background of the national (and, indeed, international) academic geological heritage is the essence of the Dutch approach's success. This is neither self-evident nor philanthropic, but signals a pragmatic approach; how can we do more with less? After all, we all have to cope with the same basic problems; shortage of time, staff, money, space, etc. Collaboration and a division of tasks is one possible solution, allowing us to specialise and, as outlined above, has proven to be quite successful. Specialisation raises the profile, but is only possible if clear choices are made regarding the identity of the institution. It is satisfactory that new owners are willing to take care of such a significant number of orphaned collections, pay for their maintenance and are eager to use them, in other words, to give them a second life. This requires an engagement, not only by one's own institution, but also by the professional community at large. Although there remains much to be improved, looking back we all realise that we would not have achieved these results without this collaborative effort and initial governmental funding.

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### **Appendix: Declaration of Halle, 2000**

The declaration reads: "Universities must acknowledge their wide cultural roles. Academic collections and museums provide special opportunities for experiencing and participating in the life of the University. These collections serve as active resources for teaching and research as well as unique and irreplaceable historical records. In particular, the collections of the oldest European universities provide windows for the public on the role of the university in helping to define and interpret our cultural identity. By valuing and promoting this shared academic heritage, our institutions demonstrate a commitment to the continued use of these resources by a broad public." The declaration was signed by representatives of the universities of: Amsterdam, Berlin (Humboldt), Bologna, Cambridge, Groningen, Halle-Wittenberg, Leipzig, Oxford, Pavia, Uppsala, and Utrecht and by the Royal College of Surgeons of England (London) (see <http://www.universeum.de>.)