[M.C. Lourenço, 2005. *Between two worlds: the distinct nature and contemporary significance of university museums and collections in Europe*. PhD dissertation, Conservatoire National des Arts et Métiers, Paris]

3. Establishing the basics: Concepts and definitions

> The [university] museum is neither an institution for the general public as are most museums; [...] nor a department of a college or university like Spanish, or Biochemistry, with its staff of teachers and students. If it were either one of these, its identity, role, philosophy and finances would be clearly delineated. [...] The beast is indeed strange.
>
> (Freundlich 1964-65: 150)

One tends to look at university museums and collections as having other museums as their main reference model[19]. University museums themselves tend to benchmark against the museum sector (Wallace 2003a,b). This is natural given that there are many aspects in common, particularly in the case of important and high profile university museums such as the Fitzwilliam Museum in Cambridge, the Hunterian Museum in Glasgow or the Musée des Arts et Métiers in Paris. However, this perspective is partial and insufficient. For the large majority of university museums and collections, the influence of the museum sector has only become truly significant in recent decades, when their purposes became under intense scrutiny. It was only then that many university museums and collections began to look at non-university affiliated museums in search for alternative organisational models, roles, and, in many cases, in search for an identity.

University museums and collections cannot be understood without understanding universities for the simple reason that they are planned, built, directed, organised, expanded, neglected and dismantled by professors, researchers, students, librarians, and alumni. If the nature, history and *modus operandi* of universities are not taken into account, one is likely to find the complexity of university museums and collections overwhelming, the reasons for their existence chaotic and arbitrary, and their public performance well below standards. One can and should benchmark against the museum sector, but only once the nature and significance of university collections is more clearly understood.

In this chapter, I will examine what makes university museums and collections so complex. I will begin by detailing their diversity, discuss terminological issues and then propose a typology of university collections that provides a practical and simple tool to discuss their past, present and future significance, thus providing signposts for the next chapters.

3.1 What is a museum? What is a collection?

As yet, no clear all-encompassing definition of 'university museum' appears to have been formulated. In fact, one of the stimulating aspects of university museums and collections is that their nature and history pose fundamental challenges to museology.

During a survey of British university museums and collections, Kelly (1999) found that many university museums, collections and galleries[20] might not meet the "official criteria" and recognised the need to be "less exclusive" (Kelly 1999: 8). She could not provide a proper definition: "I do not have a definition for a [university museum, gallery or collection] other than it is a museum, gallery or collection administratively within a degree granting institution" (Kelly 1999: 8). Indeed "if one regards the holding of a collection as the

[19] In this dissertation, the term 'university' is taken in its broadest sense and to mean all European higher education institutions, including for example the *Fachhochschulen*, the polytechnics and the *grandes écoles*.
[20] Higher Education Museums, Collections and Galleries (HEMCGs) was the designation adopted in the survey.

fundamental and necessary criterion for inclusion in the concept museum, then university museums range from the slide cabinet in the lecturer's room, to departmental collections in the care of nobody in particular, to departmental collections in the care of the most junior technician because nobody else wants the job, all the way through proper departmental collections with a designated number of staff to look after it, right up to proper university museums, as one might say, of which Manchester, Newcastle, Glasgow, Oxford, Cambridge come to mind" (Hounsome 1986: 29). Black (1984) disagreed, noting that museums are made of collections, but collections do not make a museum. "What makes a museum", he wrote, "is obviously a matter of institutionalisation and structure, but first and foremost a permanent commitment to research, preservation and interpretation of collections for all of the university community, and, to varying degrees, for the general public" (Black 1984: 21). Kinsey (1966: 106) wrote: "My definition of a [university] museum is an institution with all the implications of a major museum" and he explained: "I am not referring to cabinets containing artefacts and objects used exclusively for teaching purposes. Nor do I refer to collections acquired as a result of the efforts of wealthy individuals or alumni whose hobby collections are accepted because these individuals may favour the [university] with a healthy contribution" (Kinsey 1966: 106). Already in the 1950s, Rodeck had denounced the indiscriminate use of the term 'museum', "whether speaking of a permanent collection of a million articles, [...] collections of teaching aids, [...] [or even] empty rooms where pictures may be hung" (Rodeck 1952: 5).

A distinction should be made between the conceptual and terminological levels. There are historical reasons for a flexible concept of 'museum' in universities. However, some degree of terminological clarity is essential. Furthermore, as the museum profession evolves and standards consolidate, there is no reason to use the term 'museum' when referring to a 'collection'. The Bertolozzi prints in the library of the Faculty of Sciences at the University of Porto, the pickled human brains in the Psychology Department at Cornell, or the fossils at the Department of Human Anatomy at the University of Turin constitute collections, but do not necessarily make a museum. Both collections and museums do exist in universities and both may include objects of significant value requiring preservation. However, the distinction must be made clear, at least at the terminological level. When definitions do not exist, one needs to get them where they exist – in this case from museum associations who have set the standards for decades.

Perhaps the most consensual definition of a museum, and the one more widely applied, is provided by the International Council of Museums (ICOM). First defined in 1946, ICOM's definition of 'museum' has been subject to subsequent refinements, reflecting social change, museological research, as well as the expectations of society: "A museum is a non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment" [21]. This definition is essentially similar to those adopted by museum organizations throughout the world, including the Museums Association (UK), the Canadian Museums Association, the American Association of Museums, Museums Australia, the Finnish Museums Association, as well as the French (Musées de France) and Portuguese law. Herein the term 'museum' is therefore used in the ICOM sense.

Professional organizations do define 'museum', but usually not 'collection'[22]. In the glossary of the Code of Ethics, the Museums Association (MA) of Britain provides an operational definition of a [museum] 'collection': "a collection is an organised assemblage of selected

[21] ICOM's latest definition of 'museum' was approved in Barcelona, July 2001, and is presently under debate.

[22] Some universities define 'collection' in their collections policies (when these exist). One of the two Australian surveys of university museums and collections defined 'collection' as "that unit within the university which acquires, conserves, and researches, for the purposes of study, education and enjoyment, material evidence of people and their environment, and **which has limited, scattered or no displays**" (University Museums Review Committee 1996: 206, bold in original).

material evidence of human activity or the natural environment, accompanied by associated information. As well as objects, scientific specimens or works of art held within a *museum* building, a collection may include buildings or sites" (Museums Association 2002: 7; italics added). Here, I will adopt this definition, be it slightly modified in order to explicitly include the possibility of a university collection being permanent despite of it not being in a museum, as is the case with herbariums and many other university collections. Therefore, in this dissertation the term *collection* is used in the sense of a logically coherent system of documented material evidence of human activity or the natural environment, permanently or temporarily gathered in the framework of a clear and previously established purpose. In the university context, this clear and previously established purpose may be research, teaching, display or any combination of the three.

It should be noted that ICOM's definition is often considered problematic for university museums, particularly with respect to the interpretation of the terms 'open to the public' and 'permanent institution'. For example, the Musée d'Anatomie at the University of Montpellier was created in 1851 as a teaching resource. It had a director (who was simultaneously the chair of anatomy) and allocated funds coming from the general budget of the Faculty. It was a 'teaching museum', a concept that has a long tradition in universities (see Chapter 4). In 1945, the Musée opened to the public. Today, the museum still exists (fig. 3.1), it still has a director, yet it is no longer used as a 'teaching museum' and is closed to the public again due to lack of financial resources. So, according to ICOM's definition of a museum, when was the Musée d'Anatomie a museum proper, if indeed ever? The question is worth asking because university museums often do not have autonomous control over basic aspects such as public admittance and even their very existence. Ultimately, the university provides the conditions, the opportunities and the resources. Many university museums are permanently closed because they are given no other option. In the museum sector, a closed museum is usually rapidly dismantled and collections are transferred to other institutions. A university museum may merely close its doors and remain frozen in time for decades, like 'ghost-museums' waiting for a rebirth – yet maintaining the designation 'museum' in directories and lists. Examples are the Robert Koch Museum (Humboldt University in Berlin), the Cesare Lombroso Museum (University of Turin), and the Museo di Fisica (University of Bologna)[23].

Fig. 3.1 – Musée d'Anatomie, Université de Montpellier 1 (photo: B. Pellequer, courtesy University of Montpellier 1).

[23] Hopefully this situation will change, at least for the Musée d'Anatomie in Montpellier and the Cesare Lombroso Museum in Turin, as both are included in renovation projects initiated by their universities. The Robert Koch Museum is presently at risk due because Humboldt University Berlin recently sold the building where it is located.

Nevertheless, in university museums, closed doors may also be the result of a deliberate policy. The Museum of Vertebrate Palaeontology at the University of California in Berkeley (USA) is active in research, teaching and public outreach for all ages, yet all resources are online, nothing on the floor. On the floor are just the collections, and the Museum doors are only open for researchers and students. Public exhibition is not included in their mission statement, only teaching and research[24]. If in ICOM's definition of a museum 'open to the public' is interpreted as 'open to the general public', then it is not a museum – a paradox given that the Berkeley Museum is in fact one of the most reputed museums in the world. This paradox has led Humphrey (1992a,b) to argue that university museums require a clearer definition, encompassing special characteristics and functions of university collections that are used for teaching and research, but which have no public engagement in their mission. My view is that ICOM's definition in itself is quite appropriate as long as researchers and university students count as 'public' and I see nothing in ICOM's definition that would not allow for doing so.

New technologies have undoubtedly provided new ways for public outreach. University museums are particularly well placed to profit from new technologies and use them to reach researchers, students and broader segments of the so-called 'general public', even if they are physically closed to the public. Being closed to the 'general public' is not necessarily synonymous with being moribund. Although closed to the public, the Museo di Fisica of the University of Bologna has a highly informative website and is actively engaged in the University's Open Days (G. Dragoni, interview 12 March 2003)[25]. The same applies to many other university museums and collections in Europe.

Definitions and interpretations change and should be understood in their historical context. Standards are a relatively recent development in the history of museums and the role of the public even more so. In the 1960s, important 'research museums' such as the American Museum of Natural History (AMNH) in New York did not consider the public their priority. E.H. Colbert, Curator of Geology at the AMNH and professor at the University of Columbia wrote: "As for the display of objects that are housed and studied in the museum, this is a desirable but not a basic museum function, even though a large segment of the public and a considerable proportion of professional museum people seem to think that such is a primary museum aim" (E.H. Colbert *in* Rolfe 1969: 7). Until seven years ago, the *Rijksmuseum van Natuurlijke Historie* (National Museum of Natural History) in Leiden, the Netherlands, was only accessible for researchers and students and no public display whatsoever existed.

An increasing awareness and involvement of the 'general public' in museums could be beneficial and the important role of museums in informal education is undeniable (e.g. Gil & Lourenço 1999, 2001). However, there are disturbing signs of 'hegemony', i.e. visitors being the sole factor determining what museums are and should be and how they ought to be funded. Recently, visitors have been engaged as active developers of educational programmes and co-curators in exhibitions. Moreover, there seems to be a widespread belief that it has always been like this (revisionism also impacts the history of museums). During the past years, this trend has also left its mark on university collections and museums. There is an increasing tendency to establish simplistic hierarchies of value (i.e. define what is good or bad), using the 'general public' as absolute criterion, if not as an excuse. Certainly, university museums and collections cannot be worthy of public funding unless they provide public benefit. However, public benefit is not limited to public exhibition and needs to be

[24] See *Mission Statement* at http://www.ucmp.berkeley.edu/museum/museum.html, accessed 28 May 2005. For more information on the development of the UCMP's award-winning website, see Scotchmoore (2000).
[25] See *Museo di Fisica, Università di Bologna*, http://www.df.unibo.it/museo/welcome.htm, accessed 30 May 2005.

considered in its broadest sense[26]. It is also in a broad sense that the wording 'open to the public' in ICOM's definition must be considered, thereby making it an important and legitimate starting point to address the reality of university museums.

3.2 The diversity of university museums and collections

No one can grasp the true magnitude of the scientific, artistic and cultural heritage held by European universities. Collections are the 'dark matter' of universities: we know they are there, but no one can actually measure them. No comprehensive survey of university museums and collections at the European level has ever been done and only few exist at a national level[27]. Until a few years ago, several European universities – for example the University of Rome 'La Sapienza' – had 25-30 museums open to the public. The Humboldt University in Berlin and the University of Leipzig each list about 30 museums and collections. Pisa, Zurich and Kiel have 13 museums and collections each. Together, European universities probably have more than 10,000 museums and collections, with the total number of specimens certainly in the hundreds of millions[28]. Clearly, a significant proportion of the European scientific, artistic and natural heritage is in universities across the continent. In most cases, this heritage is virtually unknown outside the university to which it belongs and, *hèlas*, often also unknown within the very university to which it belongs.

University collections encompass all possible disciplines. As Rodeck (1952: 4) stated, "There is every possible combination [...] and almost every imaginable subject, from dentistry to church history, [...] represented by a museum at some university". The designations may vary, but university collections cover 'traditional' fields such as natural history (which can in practice result in any combination of zoology, botany, mineralogy, geology, palaeontology and anthropology), art, archaeology, anatomy, pathology, among others. University collections also encompass collections of history – including social history, history of religion, history of the university (university memorabilia), history of student life, history of medicine, pharmacy and pharmacognosy, technology and engineering, physics, chemistry, and astronomy. University collections also cover more specialised subjects, such as history of design and textiles, history of theatre, geophysics, geodesy, meteorology, genetics, ecology, microbiology, and marine biology[29].

[26] Who pays is a different matter altogether and should be kept separate. It is however my view that if museums have responsibilities that far exceed exhibition, yet fall within 'public benefit', then the public is willing to pay for them if these responsibilities are properly explained.

[27] Published national surveys of university museums and collections were undertaken in the Netherlands in the 1980s and 1990s, the UK between 1989 and 2002. In France, there is an ongoing survey, but no data has been published yet. Italy and Germany have ongoing surveys too and the data has been made available on the internet (see Chapter 5).

[28] See Appendix A1.

[29] For a more comprehensive overview of disciplines represented in university collections, as well as institutional types, see UMAC's Worldwide Database at http://publicus.culture.hu-berlin.de/collections/

Fig. 3.2 – Techniek Museum, Technical University Delft (storage).

In terms of objects, university collections encompass a diverse typology, from minerals, crystals, meteorites, rocks, sedimentary soil profiles, plants, fungi, algae, bacteria, living marine and freshwater organisms, seedbanks, fossils, wet and dry zoological specimens, fruits, fibres, resins, barks, embryos, skins, skeletons, skulls, bird nests and eggs, anomalies and monstrosities, clothes and textiles, paintings, drawings, sculptures, jewellery, weapons, toys, musical instruments, astronomical instruments, surgery instruments, thermometers, chemistry equipment, sound archives, chemicals, measure standards, balances, machines, tools, cars, planes, boats, maps, photographs, slides, books, and the list could go on and on. University collections also include plaster, wax, and wood models, replicas, prototypes, and miniatures. In number of objects, university collections may vary from a couple of dozens each to tens of millions of objects.

Fig. 3.3 – Herbarium, University of Leipzig (seed bank).

Fig. 3.4 – Abel Salazar House Museum, University of Porto (photo Abel Salazar House Museum Archives).

At the organisational level, there are several models. Apart from the more 'traditional' museums and botanical gardens, it is worth mentioning that universities also have historical buildings and house-museums (e.g. Unamuno House Museum, University of Salamanca, Legado de Ortiz Echagüe Museum, University of Navarra, House Museum/Memorial Môri Ogai, University Humboldt Berlin, Kettle's Yard in Cambridge, and the Abel Salazar House Museum, University of Porto), science centres (e.g. Maison de la Science, University of Liège and Jodrell Bank Science Centre, University of Manchester), planetariums (e.g. Steno Museum, University of Aarhus and Museum of Science, University of Lisbon), castles (e.g. Durham Castle, University of Dundee), aquariums (e.g. Aquarium of Banyuls-sur-mer, University of Paris 6 Pierre et Marie Curie), ecomuseums (e.g. Ecomusée de la Région du Viroin-Treignes, Université Libre de Bruxelles), hospital museums (e.g. Museum at the Psychiatry Hospital, University of Aarhus), sacred art museums (e.g. Temple of the Annunciation Museum, University of Seville and Sacred Art Museum, University of Coimbra) and contemporary art museums (e.g. Laboratorio Arte Contemporanea at La Sapienza and Museo de la Universidad de Alicante).

Fig. 3.5 – Permanent exhibition *Simmetria, giochi di specchi*, Department of Mathematics, University of Milan (reproduced with kind permission of the University of Milan).

Fig. 3.6 – Collections of Christian archaeology (part), Faculty of Theology, Martin-Luther University of Halle-Wittenberg (reproduced with kind permission of the University of Halle-Wittenberg).

There are also national museums under the direct administration of universities or, more generally, of higher education or research institutions, e.g. the National Museum of Natural History, University of Lisbon, the National Museum for the History of Medicine, University of Porto, the Musée National des Arts et Métiers (CNAM) in Paris, the National Museum of Architecture, Universidad Politecnica de Madrid, the Museo Nazionale degli Strumenti per il Calcolo, University of Pisa, and the Musée National de l'Éducation in Rouen of the Institut National de Recherche Pédagogique. In Norway, the national museums of archaeology and natural history are at the University of Bergen. There is at least one museum that is simultaneously a national museum and a research institution comprising a *Ecole doctorale*: the Muséum National d'Histoire Naturelle in Paris.

Fig. 3.7 – Sound archive, Department of Zoology, Humboldt University Berlin (reproduced with kind permission of the Humboldt University Berlin).

Nevertheless, as Merriman (2002: 74) said, in universities there is a "divide between 'the museums' and 'the collections'". Universities also have collections and these are undoubtedly

in the majority. Typically, they are in departments, institutes, astronomical observatories or other facilities. In Europe, some important examples are the historical collections of the École Nationale Supérieure des Beaux-Arts (Paris), the palaeontology collections at the University of Lyon Claude Bernard, the animal sound archive at the Humboldt University in Berlin, the collection of scientific instruments at the École Polytechnique (Paris), the Egyptology collections at the University of Strasbourg (March Bloch), the Galton Collection (University College London), the Egas Moniz Collection (University of Lisbon), among many others, including almost all herbariums. Conditions of public access vary – some collections are displayed in a permanent and dedicated space without being accessible to the public, for example art collections and university memorabilia. Other universities have art collections on permanent display in galleries open to the public – such as the Courtauld Institute of Art Gallery (London), the Galerie Wittert (University of Liège) and the Whitworth Gallery (University of Manchester). Art galleries without collections – hosting temporary exhibitions – are also found in universities. Although outside the scope of this research, such galleries are widespread, e.g. the Université de Lille (Sciences et Technologie), the Université de Bourgogne (Dijon), the Université Libre de Bruxelles, and the University of Rome 'La Sapienza'.

Fig. 3.8 – Collection of scientific instruments from the University of Sciences and Technology in Lille: temporary exhibition at the *Espace Culture* of the University, April 2004 (reproduced with kind permission of the Université des Sciences et Technologie de Lille).

Finally, collections can also be found in university libraries. Keeping collections of objects in libraries is an old tradition in many European universities. As early as 1638 there was a gallery of antiquities in the Bodleian Library at Oxford University (MacGregor 2003). Collections under the jurisdiction of libraries may come under the designation 'library special collections' or '*fonds anciens*', they may be technically considered (paper) archives yet they may contain museum-type objects. These archives may be associated with the history of the university (e.g. the College Archive Collection at Imperial College London, the Fonds anciens et précieux de la Bibliothèque universitaire, Université de Bourgogne in Dijon) or with a personality (e.g. Brunel Collection at the library of the University of Bristol). In fact, 'museum-type' collections are so common in university libraries that librarians have already claimed a whole new professional field – that of curatorship (e.g. Kemp 1994).

One conclusion necessarily follows from this diversity of sizes, types, disciplines, management, objects: if these entities are to be approached as a group, one needs to simplify. A first step is to eliminate multiple and often divergent designations. Galleries (with

collections), house-museums and historical houses, science centres, botanical gardens, all fit in the 'museum' category as defined by ICOM. Herbaria, library special collections, instruments, special archives, 'orphaned' collections abandoned in attics and the like fall under the designation of 'collection'. This is the first terminological and conceptual simplification: the diversity described above can be reduced to collections and museums (a simplification I have in fact used throughout this text so far). The second simplification is the recognition of the collection as main unit and its study separate from any form of organisation. There are two advantages to this. Firstly, it is intuitive and inclusive. As Warhurst (1986: 137) stated: "what we are really talking about is university collections, some of which happen to be in museums". Secondly, it enables the elimination of factors one cannot control. While in universities assembling collections is normally done for purposes which one can identify and understand, what happens to them afterwards is far more difficult to assess. University collections can be located in museums, libraries, galleries, storages, lecturing rooms, offices, laboratories, attics or basements. They can be how and where they are for an infinite number of reasons and for long or short periods of time. In particular, the organisation of museums may be driven by historical, political, practical or other "haphazard and unsystematized" reasons (Duggan 1964: 282, Maigret 2001), such as personal and persistent involvement of professors, a sudden appearance of funds, an unexpected donation, or even sheer chance.

Apart from being inclusive, the choice of the *collection* as main unit of study is also practical and has been adopted before. The first published survey done in Europe used the collection as unit. Sponsored by the Netherlands' Ministry of Culture, it was entitled *Landelijk Overleg Contactfunctionarissen Universitaire Collecties* (Survey Group for University Collections) (LOCUC 1985). Later surveys in the Netherlands followed the same approach under the name *Landelijke CoördinatieGroep Academische Collecties* (National Coordinating Group for Academic Collections) (Anonymous 1995b, 1997, Stoop 1999, Galen & Stoop 2000). The European network *Universeum* adopted both categories 'collection' and 'museum' (Bremer & Wegener 2001). In England, surveys began by using collections and museums as units, but later the acronym HEMGC (Higher Education Museums, Galleries and Collections) was adopted (Arnold-Foster 1989, 1993, 1999, Arnold-Foster & Weeks 1999, 2000, 2001). Similar surveys conducted in Northern Ireland (Northern Ireland Museums Council 2002), Wales (Council of Museums in Wales 2002) and Scotland (Drysdale 1990) adopted the collection as the inclusive unit. When Kelly (1999) surveyed management issues in British university museums and collections, she adopted HEMGC as a broad category. The HEMGC category was also used by Merriman (2002) and, with a slight adaptation, by Danilov (1996) in his US directory. Australian surveys used 'collection' and 'museum' (University Museums Review Committee 1996, 1998). Authors who aim to be inclusive – for example, by describing the whole panorama of a country – seem to prefer 'collections' (e.g. Arnold-Foster 2000, Hudson & Leggett 2000, Labrador 2000, Stanbury 2003, Weber 2003) or 'museums and collections'. The same happens in the designation of national and international associations. In fact, several international committees of ICOM are 'of museums and collections' (e.g. CIMAM, CIMCIM, CIMUSET, NATHIST, UMAC). Adopting the collection as main inclusive unit does not mean that the museum is irrelevant. It merely means that the organisation of collections in museums brings up a different array of issues that are better addressed separately.

3.3 Terminology

> The beginning of knowledge consists in learning to call things by their names.
>
> Old Chinese proverb
>
> What is the wisest thing? Number; but second to the one who assigns names to things.
>
> Pythagoras

Terminology is an important aspect of scientific endeavour. If different authors use the same word with different connotations or if the same word expresses different meanings, confusion will be the result. A consistent terminological body is also a sign of 'scientific maturity'. In the

case of terminology employed in museology and museum studies, chaos has prevailed for a long time, despite a few valuable attempts to bring order to the terminology used[30]. ICOM has been asking for *thesauri* and standardisation at least since 1978 (resolution adopted by the General Assembly), but so far to no avail.

Terminological inconsistency and conceptual depth are different sides of the same coin. Terminological inconsistency stems from lack of conceptual depth, which in turn generates terminological problems. In the case of university museums and collections, their diversity, their traditionally strong ties with the subject-matter of the collections, and the divide between academia and the general museum sector have resulted in a complex terminological body. However, university museums have barely began to think about themselves as an autonomous group and there will likely be less terminological inconsistency as the development of a coherent philosophy about their role and nature takes shape.

For clarification, but also as a tool towards a better understanding of university museums and collections, a terminological survey was undertaken (see Appendix A7). As a result of this survey (complemented with terminology 'collected' during study visits), three major terminological problems were identified: a) country-specific terminological problems; b) terminological problems of a general and broad nature, shared with non-university affiliated museums; and c) specific terminological problems. These three problems will be briefly discussed, while at the same time clarifying the terms adopted herein.

3.3.1 Country-specific terminology

Given that this research had an international scope, particular attention was given to the meaning of terms in different languages and countries. For example, there is a significant difference in the use of the term 'anatomy' in Europe. In the Anglo-Saxon tradition, anatomy is fundamentally a synonym of macroscopic anatomy; microscopic anatomy does not exist as such and is instead designated histology. In the Latin tradition, anatomy can be microscopic *and* macroscopic and histology only relates to the cell and tissues[31]. Such nuances are crucial and need to be taken into account to understand the origin and development of university collections in different countries.

Archaeology in the USA is frequently considered a speciality within anthropology (the study of Man), whereas in Europe these have traditionally been two independent fields of study (Sturtevant 1969). Since this study focuses on Europe, one would suppose no particular caution was needed – this is not so. I will illustrate this with examples from one country, i.e. Portugal. At the University of Porto, the Museum of Archaeology and Prehistory not only includes the collections of anthropology, but the Museum is also an integral part of the Museum of Natural History. This is not because the University of Porto is particularly aligned with American traditions, but the result of a chequered history[32]. At the University of Lisbon, the National Museum of Natural History includes the university collections of physical anthropology, but not ethnology (which formed the basis of the National Museum of

[30] The *Dictionarium Museologicum*, containing 1,632 entries in 20 languages, was published by ICOM/CIDOC in 1986 (Budapest). Other projects of terminological homogenization (in München and Amsterdam) followed suit, as well as a number of meetings on the subject promoted by ICOFOM. *Thesauri* were developed at a disciplinary level (e.g. by the Getty Foundation). Peter van Mensch has published prolificly on the subject of terminology in museology and museums – for references and online papers, see the Reinwardt Academy's website at http://www.mus.ahk.nl/

[31] The same goes for treatises. In the Anglo-Saxon tradition treatises of histology include microscopic anatomy. Often reference collections are derived from such treatises and different terminological traditions impact the designations of collections and what they comprise.

[32] The professor who is at the origin of the Museum of Archaeology and Prehistory – António Augusto Mendes Corrêa – was chair of Anthropology at the Faculty of Sciences and simultaneously in charge of the Museum of Ethnology, the Art Gallery and the Museum of Archaeology at the Faculty of Humanities [*Letras*], where he was also professor. When the Faculty of Humanities was extinguished for political reasons in 1928 (only to be re-established in 1961) (Santos 1996), its collections were partly transferred to the Faculty of Sciences and integrated in the Museum of Natural History.

Ethnology) and at the University of Coimbra, the Museum of Natural History includes both physical anthropology and ethnology. There exist many similar examples in other European countries and caution is therefore always necessary in order to understand what is meant by the various disciplinary designations.

3.3.2 General terminology: uses of 'teaching' and 'research'

Issues of general terminology in museums are beyond the scope of this dissertation. However, the use of the terms 'research' and 'teaching' by the museum sector in general are in need of further clarification. Lourenço (2002) discussed this topic, but a brief review is appropriate here as university museums are likely to use the terms 'research' and 'teaching' often with a different meaning than the museum sector in general.

Education is an integral mission of all museums and although this may take a wide variety of forms, the museum sector generally does not use the term 'teaching' – terms and expressions such as 'informal education', 'interpretation', or simply 'education' appear to be more current. The museum sector focuses on the visitor, who assumes control of his or her voluntary learning experiences. In contrast, 'teaching' is centred on the teacher – the one who teaches – and is too loaded with the context of formal education (the museum sector does not use the term 'teacher' either, generally preferring 'docent'). The term 'teaching' [or *enseigner*, *ensinar*, *enseñar*, *insegnare*] is of widespread use in universities and has a long tradition – 'teaching' is in fact centuries older than 'research', the modern sense of which originates in the 19th century. Many university collections began as teaching collections and formal teaching was – and still is – an institutional responsibility of many university museums. Unless stated otherwise, in this dissertation the term 'teaching' – or 'teaching collection' – is used in the sense of formal teaching aimed at higher education students.

The term 'research' is more complex and in itself a multi-level concept with many facets at each level. It is commonly linked with the word 'science', which is not a simple term either. Some authors point out that languages such as English – and, for that matter, French, Spanish, Portuguese and Italian – have a rather "narrow and historically perverse" meaning for the word *science* (Schupbach 2001: 232, S. de Clercq, *in litt.* 12 August 2002), no matter how rich these languages are in other respects. In marked contrast, the German and Dutch equivalent words – *Wissenschaft* and *Wetenschap* – have a clear and direct link with the advancement of knowledge in a broad sense.

How does the museum sector generally perceive 'research'? There is no straightforward answer to this question as research has always been a 'hot topic' in the museum sector. There is an extensive literature on the subject and a plethora of meanings can be identified. This is partly due to the multilevel nature of museum theory and practice, partly to the complex nature of the term 'research' as outlined above, and partly because in contemporary society research is a 'prestigious' term hijacked by many – from committees' reports to governmental legislation, from hospital administrators to journalists, from unions to non-governmental organisations. Research is a broad term, it is all-encompassing and provides 'credibility' to those who use it. However, when using the term 'research' in a museum context, one has to clearly state what is meant.

A clear distinction should be made between discipline-based research (e.g. research in archaeology, history of art, anthropology) and for museological purposes. Both use the object as a source of information, but while one promotes understanding in the disciplines represented in the collection, the other promotes understanding in the field of museology. Mensch (1994) designates the former 'museum research' and the latter 'museological research', a terminology also followed by Beneš (1994) and the ICOFOM (1994), among others. In a similarly binomial way, Pearce (1995: 259) states that 'museum theory' encompasses: i) the discipline-based study of the museum material, and ii) the study of the history and nature of museums, their holdings and their operation. For 'discipline-based

research' synonyms used are e.g. 'research-oriented curatorship' (Davies 1984: 165), 'collection research' (Davies 1984: 166), 'curatorial research' (Hounsome 1984: 161), 'systematic object research' (Bridgen 1984: 171), 'subject-matter research' (Mensch 1992), 'museum-based research' (Bridgen 1984: 171, Fenton 1995: 225), 'discipline-based study of museum material' (Pearce 1995: 259), and 'subject-based expertise' (Fenton 1995: 224). Other than multiple synonyms, research is often reduced to other museum functions, in particular curatorship and interpretation (e.g. Parr 1963, Bridgen 1984). Research can also be (mis)identified, particularly in art museums, with object authentication and conservation (e.g. Parr 1963). In one of the latest editions of the *Collections of the British Museum*, the last chapter of the book is entitled 'Research', after chapters devoted to the study of collections (Egyptology, Numismatics, etc.). In the chapter, research is exclusively associated with conservation, and reduced to "the scientific examination of collections", meaning to "provide important information on when, how and where objects were made and what materials they were made of" (Wilson 2001: 282).

In this dissertation, the term 'research' does not merely refer to the investigation needed to write an exhibition label or catalogue, to answer queries from the general public or to determine the authenticity of an object and why or where it was collected. These are institutional routines that are often called 'research' and they may indeed qualify as such, depending more on the *how* than on the *what*. Unless stated otherwise, in this dissertation the term 'research' – or 'research collection' – means discipline-based research, i.e. the deliberate and hypothesis-driven activity that enhances disciplinary knowledge.

3.3.3. Specific terminology

Over the years, university museums and collections developed a terminological body (or rather a jargon) often not shared by the broad museum sector. This terminological specificity is a consequence of many decades of keeping a balance between three functions – research, teaching and public display – and therefore particularly illustrative of the conceptual framework under which university museums and collections operate. Being positioned between two worlds resulted in interesting hybrids, such as 'the display museum' *vs.* 'the working museum' (MacDonald 2000: 83), the 'display collection' (Nicks 1991: 112) and 'teacher-curator' (Coolidge 1956: 169). Indeed, this specific terminology represents a splendid key to the world of university museums and collections.

As the survey illustrates (see Appendix A7), the terms 'teaching collections' and 'research collections' are widely used to refer to collections resulting from or organised to support collection-based teaching and research. This is also the sense in which these terms are used in this dissertation. Hudson & Legget (2000: 21) used the expression 'collections didactiques' as a synonym for 'teaching collections'. In many museums, teaching collections are displayed exclusively for students – this is why Baramki (1970: 30) used the expression 'students' gallery', while Van den Driessche (2000: 39) used 'galerie didactique'. The expression (and concept) 'teaching museum' is also used (e.g. Warhurst 1984: 81) and the concept itself has a long tradition in universities.

Keene (1995) used the expression 'collection d'étude' for collections exclusively in store, suggesting an incompatibility between display and research functions. Similarly, Pierre Bariand, interviewed about the collection of minerals of the Université Pierre et Marie Curie (Paris), used the term 'collection de travail' – as a synonym of research collection – opposed to 'collection d'exhibition' (P. Bariand *in* Anonymous 1995a: 4). This dichotomy is further amplified in the use of 'public collection' *vs.* 'scientific collection' (Jorge 1952: 135), 'display museum' *vs.* 'working museum' (MacDonald 2000: 83) and 'public exhibition' *vs.* 'reserved exhibition' (MacDonald 2000: 78).

Warhurst (1984: 80) speaks of 'reserve collections' as a synonym for 'research collections', while Hudson & Legget (2000: 22) applied the expression 'matériaux de réference et de

recherche'. Other synonyms of research collections found in the survey are 'scientific collections' (Parr 1958: 14, Jorge 1941: 82) and 'study collections' (Collier 1962: 323, Guthe 1966: 103, Nicks 1991: 113). Hudson & Legget (2000: 20) used the expression 'collections scientifiques' as a synonym for 'research collections', while Van den Driessche (2000: 39) used the same for 'collections of exact sciences' (e.g. history of physics, astronomy, etc.).

The bulk of material resulting from field research (e.g. in archaeology, geology, palaeontology) is often subjected to study and selection before being accessioned and preserved. In such cases, some authors (e.g. Saville 1999, 2002) refrain from applying the designation 'collection', preferring to use 'assemblages'. Likewise, the Society of Museum Archaeologists (UK) designates these 'bulk collections' (Minsky 1976: 40) as 'field collections' (Society of Museum Archaeologists 1993). The ICOM Code of Ethics uses the expression 'working collection' (ICOM 2004), which is simpler and self-evident[33].

The term 'sub-collection' also appears in the professional literature (e.g. Minsky 1976: 40) as a practical expedient for collections management in research. Although not exclusive of the university museum world, the term 'sub-collection' was recently adopted in university contexts – e.g. recent reorganisation projects in Dutch universities – as a unit to cope with the number of objects and thereby better assess university heritage. Clercq (2003: 33) defines the concept of sub-collection as: "[...] 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 identified by the name of the collector, the year, a geographical site or a subject, usually a combination, for example 'Subbetic Zone, Sierra de Maria (Spain), de Clercq, student-collection, 1968' ".

The great variety of terms employed is itself evidence of the multi-leveled practice associated with collections in universities. Hybridization is not necessarily something bad to be avoided, as it is a direct consequence of the position of university collections between the world of professional museums and the world of higher education. There is, however, need for greater clarity and consistency in terminology.

3.4 Typology of university collections

Usually, university collections and museums are classified according to disciplinary criteria (e.g. zoology collections, archaeology collections, museums of science, etc.). Classifications based on the nature of objects are also common (e.g. 'musée de moulages', anatomical wax models, herbariums, collection of mathematical models, collections of maps, drawings, etc.). Non-disciplinary and all-encompassing typologies of university collections are rare, which is hardly surprising. First, their diversity makes it difficult to provide a classification that goes beyond mere disciplinary categories. Secondly, because they are subject to constant change (mirroring advances in higher education and research, as well as institutional changes within the university), university collections are too complex, dynamic, and indeed historical to be boxed in rigid categories.

Typologies drawn from museum textbooks and manuals depend too much on the practice, organisation and exhibition function ('permanent collection', 'display collection') of non-university affiliated museums, which is not applicable to the broad spectrum of university collections. For example, according to scope, Lord & Lord (1991) classified collections in: a) representative collections, b) systematic collections, c) associative collections, and d) opportunistic collections. Edson & Dean (1994) recognised three categories, depending on the museum's mission: a) permanent collection, b) research collection, and c) education programme collection. Lord & Lord (1991) provided an alternative classification, based on

[33] The *ICOM Code of Professional Ethics* was adopted at the 15th General Assembly of ICOM meeting, Buenos Aires, Argentina, 1986. It was amended at the 20th General Assembly meeting in Barcelona, Spain, in 2001, and revised at the 21st General Assembly meeting in Seoul, Republic of Korea, in 2004.

use: a) display collection, b) study collection, c) reserve collection, d) demonstration collection, and e) library and archives collection.

However, a number of non-disciplinary typologies for university collections do exist. A recent survey of university collections in Northern Ireland (Northern Ireland Museums Council 2002) established seven categories of university collections based on their provenance and development:

- collections acquired to support teaching and research;
- collections accumulated as a by-product of research activity;
- collections significant to the development of a subject or to a department;
- collections donated by donors who see the university as a safe repository;
- portraits commissioned and works given as memorials;
- collections acquired by the university (ceremonial paraphernalia, silverware);
- works acquired to display in public spaces.

This typology is comprehensive and provides a proper account of the development of university collections (not only in Northern Ireland, but in the world). Although it has the merit of differentiating between collections assembled for research purposes and collections resulting from research, the classification is too long and complex.

Typologies especially developed for online databases also exist, yet they are more useful as search tools designed to facilitate the life of the database user than for theoretical insight. The Wits University Database and the Australian University Museums Information System both follow disciplinary criteria[34]. The database developed by UMAC – UMAC Worldwide Database (in progress) – has a triple searchable system organised disciplinarily, geographically and by type. The 22 types listed are: 'museum', 'collection', 'anatomical theatre', 'aquarium', 'arboretum', 'archive', 'art gallery', 'arts centre', 'astronomical observatory', 'biological station', 'botanical garden', 'detention room'[35], 'greenhouse', 'herbarium', 'house museum', 'memorial', 'planetarium', 'science centre', 'sculpture park', 'sound archive', and 'virtual collection/museum'.

Possibly the simplest and most cited classification (used in several UK surveys) of university collections was proposed by Hamilton (1995). Although recognising that collections might have been formed randomly, Hamilton (1995: 73) provided a typology of university collections made up of four categories:

a) ceremonial collections, encompassing items related to the university history (e.g. university mace, silver, ceremonial furniture, etc.);
b) commemorative collections, encompassing portraits of distinguished individuals related to the university's past, works of art given in memory, silver, etc.;
c) decorative collections, encompassing works of art acquired by the university to decorate public or private spaces within the university;
d) didactic collections, encompassing works of art, natural history specimens or artefacts acquired for research, teaching and demonstration.

Hamilton's typology is simple though liable for amendment. Firstly, it has a strong bias towards collections of arts and humanities; secondly, categories a) and b) clearly overlap; and thirdly, 'didactic collections' is prone to misunderstanding as 'didactic' is instantly associated with teaching while the category itself is meant to encompass both teaching and research.

[34] See respectively Wits University Database, sunsite.wits.ac.za/mus/ and Australian University Museums Information System (AUMIS) database, http://www.lib.mq.edu.au/mcm/aumis/index.htm, both accessed 28 May 2005.

[35] A 'detention room' is a space in which, in the past, universities put students when they misbehaved. Some universities, particularly those of German influence, have restored these rooms and opened them for visitors. There are restored 'detention rooms' at the universities of Greifswald, Göttingen, Heidelberg (Germany) and Tartu (Estonia), among others. The 'detention room' at the University of Tartu is part of the University Art Museum (both located in the University main building).

3.4.1 A working typology

There are many possible typologies of university collections. I propose the following working typology, based on Hamilton (1995) (see figures 3.9 to 3.19).

a) **research collections**: collections that originally result from collection-based research or were organised to support it;
b) **teaching collections**: collections that were originally organised to support collection-based teaching;
c) collections of historical teaching and research objects, or simply **historical teaching and research collections**: collections of historical instruments, other equipment and specimens formerly used for teaching and research that were organised in collections after becoming obsolete;
d) **collections of university history**: collections of university memorabilia and student life, as well as biographical collections related to a personality (e.g. a former rector, professor or student).

University art collections will be addressed in more detail below because some fall within these categories.

Fig. 3.9 –**Research collection**, archaeology: collection of beads at the Petrie Museum of Egyptian Archaeology, University College London. Petrie's exhibition reflects the typological organisation of the collection and corresponding catalogues.

Fig. 3.10 – **Research collection**, zoology: a series of bird skins of *Cyanopica cyanus* at the Museu Bocage (National Museum of Natural History), University of Lisbon (photo C.J. Hazevoet).

Fig. 3.11 – **Teaching collection**, anatomy, Institut d'Anatomie, University of Strasbourg Louis Pasteur.

Fig. 3.12 – **Teaching collection**, archaeology, Musée de Louvain-la-Neuve, Université Catholique de Louvain (Belgium). The artefacts are organised by material (ceramics, glass, etc.), independently of provenance, excavation or other factors.

Fig. 3.13 – **Teaching collection**, topological models, Department of Mathematics, University of Milan.

Fig. 3.14 – **Historical teaching collection**, botanical models in wood, Institut de Botanique, University of Strasbourg Louis Pasteur (photo S. Soubiran).

Fig. 3.15 – **Historical teaching collection**, historical crystal models for mineralogy, Oxford University Museum of Natural History (photo M. Price).

Fig. 3.16 – **Historical teaching and research collection**, medical instruments: the Bambilla collection (part), displayed at the entrance of the Aula Sarpa, Museo per la Storia dell'Università, University of Pavia.

Fig. 3.17 – **Historical teaching and research collection,** technology: Techniek Museum, Technical University Delft.

Fig. 3.18 – **Historical teaching collection**, history of art. The Swillens Collection (only partly depicted), presently at the Utrecht University Museum is a collection of art materials, pigments and tools organised to support teaching (photo P. Rothengatter).

Fig. 3.19 – **Collection of university history**, Martin-Luther University of Halle-Wittenberg.

The proposed typology is simple, intuitive, applicable to every discipline and comprehensive as long as one keeps in mind that, with time, university collections change in the way they are perceived and used. For example, research collections can also be used for teaching (in multiple disciplines). Teaching collections and historical collections can also be used for research. Many research collections are no longer used for their original purpose, but this does not necessarily transform them into historical collections: they may simply be less used due to shifts in scientific research. Uses of collections are infinite and technically impossible to account for in a typology and can be better understood through the history of university collections[36].

Fig. 3.20 – Example of a historical teaching collection used for present-day teaching. Depicted is a huge ovarian cyst collected in the 19th century. Given that today these situations are very rare because patients are given treatment, students of medicine and pharmacy study them as extreme examples prior to the introduction of pharmaceuticals (courtesy Museo per la Storia dell'Università, University of Pavia).

An additional advantage of this typology is that it accounts for the two major processes of collecting in universities: either by purposeful and selective collecting driven by internal needs [types a) and b)] or by historical accumulation [types c) and d)]. Danilov (1996: 17) identified these two processes in his survey of university museums and collections in the

[36] In fact, there is nothing particularly special about university collections in their multiplicity of usage and users. Theoretically, any collection can be used for an infinite diversity of purposes and typologies cannot fully account for all uses. When a collection is thought of as a 'collection of social history', this does not necessarily mean that it is only used by historians. Similarly, a natural history collection does not cease being that because it is used by artists. Collections are not (only) what they are because of their users and the way they are used.

USA. He designated 'internally-generated' those natural history and related collections directly resulting from teaching and research, while for historical collections he used the common disciplinary terminology (e.g. museums of science, history museums, etc.). If appropriate and the context is clear, I may designate collections resulting from purposeful and selective collecting associated with teaching and research 'first generation university collections' and those resulting from historical accumulation 'second generation university collections' (see table 3.1 for a summary).

	Type	Process of collecting	Examples
First generation	**Research collections**	Purposefully for research or as a result of research.	Herbaria, palaeontology and zoology collections, bioacoustics collections, collections of microbiology, pathology and embryology, anthropology collections, archaeology collections, etc.
	Teaching collections	Purposefully for teaching.	Collections of surface models in mathematics, models in engineering and architecture, sculpture casts in art, etc.
Second generation	**Historical research and teaching collections**	Historical accumulation.	Historical instruments in physics, astronomy, medicine or other disciplines; historical collections of mathematical models, etc.
	Collections of university history		Portraits and sculptures related to the university, biographical collections, memorabilia.

Table 3.1 – Summary of proposed typology of university collections.

3.4.2 University art collections

University art collections deserve special reference and are undoubtedly worthy of a study of their own. During this research, I found a larger diversity of art collections than initially expected. Although courses in the history of art have been provided by the many European universities ever since the 19th century, the same does not apply to art itself. For example, in the Netherlands painting, sculpture and design are taught at intermediate level. I expected that university art collections (and museums) would be a limited phenomenon in Europe (Zeller 1985), but reality proved me wrong. Five major types of art collections were encountered:

1. Art collections related to the history of the university: portraits and busts of rectors and professors, paintings and drawings of buildings, etc. These often lack documentation on who commissioned or donated them and when. Even the identity of the artist may be unclear at times. These works have documental value for the university's history and resort in the category 'collections of university history' as defined above.

2. Decorative art collections displayed in cabinets and public areas in order to provide a pleasant and inspiring environment for learning and study and simultaneously project a prestigious institutional image. Although possibly more common in the USA and Australia (Coolidge 1966), decorative collections are not rare in European universities. Purely decorative art collections are outside the scope of this study given that they are no different from art collections owned by private foundations, insurance companies, embassies or banks. However, art collections are among the oldest collections in universities and when history of art emerged as a field of study in the 19th century, many purely decorative collections were reorganised for teaching purposes. This issue will be addressed in chapter 4.

3. Teaching art collections associated with the history of art, archaeology or fine arts. There are three sub-categories: a) collections representative of a given period in the history of art; b) collections of casts (*moulages*), also used in the teaching of classical archaeology; and c) reference collections of materials and techniques (e.g. the Swillens Collection depicted in fig. 3.18). Apart from examining and studying the originals or replicas, students may also be asked to write monographs and curate their own exhibitions (including selecting works and compiling the catalogue). More often than type 1. and 2., which tend to be scattered, these collections are typically kept in a dedicated space (gallery or museum) to facilitate access.

4. Collections resulting from works of art made by students or professors, such as the 'Prix de Rome' collections at the École Nationale Supérieure des Beaux Arts (Paris) – today an 'historical' collection with paintings by Ingres, Matisse, Delaroche, etc. However, when Ingres and Matisse did the works they were still students and later *maîtres*. Today, the École des Beaux Arts continues to occasionally incorporate contemporary art done by students and *maîtres* (E. Brugerolles, interview 26 June 2002). Another example is provided by the Mackintosh's Collection and Archive at the Glasgow School of Art, assembling works done by Charles Rennie Mackintosh when he was a student, as well as later works and other documentation. Often, students' art works were the result of formal evaluation processes. Therefore, the paintings, drawings and sculptures were considered by the university exactly like exams in physics or biology and archived for a given administrative period (typically five years). A significant part of the art collection of the Faculty of Fine Arts at the University of Porto is the result of these formal exams[37]. The same with the collection of the Birmingham Institute of Art and Design at the University of Birmingham: "it is primarily an art collection of staff and student works" (Everitt 2002). Although these collections are normally used for research in the history of art and design, there is no doubt that they have an experimental nature. They are certainly documents in the history of art, but being first works, they also represent material evidence of the process of artistic creation and its gradual development.

5. Art collections to support research in distinct fields, for example the drawings and sculptures at the Cesare Lombroso Collection, University of Turin, or other art works done by psychiatric patients. Some universities often collect and maintain (and sometimes display to the public) collections of children's art for the teaching of child development (e.g. University of Madrid, University of Macquarie, Australia[38]). A particularly interesting example is the Museum of Fakes at the University of Salerno, Italy. The collection is part of the Centre for the Study of Forgery, created in 1990 by the sociologist Salvatore Casillo, a sociologist who researches the 'technology, motivation and culture of forgery' (Williams 2004). As Castillo pointed out: "We only collect fakes. The better the fake, the better for us". The Museum has copies of Boticellis, De Chiricos, Greek and Roman sculptures and hundreds of other falsifications produced in Italy.

[37] Although not technically considered art collections, the Museum of Science of the University of Lisbon has a significant collection of drawings of machines and models that result from exams done by students and the same goes for the Museo del Politecnico at the Politecnico of Turin and other European universities. Perhaps the most important collection of technical drawings is owned by the Musée des Arts et Métiers in Paris. Until recently, 'drawing' was an integral part of the teaching of physicists, astronomers, mathematicians and engineers. However, its historical role in teaching is considered minor and generally overlooked (when compared with the role of drawings in the training of zoologists and botanists). As a result, the significance of technical drawings is often misunderstood and collections are left in a museological limbo: they are rarely interpreted as teaching drawings of historical value and often displayed half-curiosity half-*objet d'art* (preferably alongside the machine represented in the drawing). These collections fall in the category historical teaching and research collections (second generation).

[38] See Leary (1999).

Perhaps even more than any other type of collection, university art collections present a challenge to categorise. Art collections probably have more diverse origins and purposes than other university collections. Due to its intrinsic nature, an art collection is also more intensively used than a teaching collection of models of irrigation systems. The Collection of Fakes at the University of Salerno is organised in a museum and enjoys considerable public interest, although strictly speaking it is a sociology research collection (how many of its visitors are aware of this?). Art collections are probably also less vulnerable to arbitrary disposal compared to other university collections. They may have originated in an initial donation and later catalysed further acquisitions and the development of teaching and research. They may also have arrived at the university as part of a building, for example Kettle's Yard at the University of Cambridge or the House-Museum Abel Salazar at the University of Porto. Moreover, an ethnographic specimen may also be appreciated, interpreted, researched and displayed as an *objet d'art.*

There are both research and teaching collections among university art collections – namely types 3, 4 and 5. These share common aspects with research and teaching collections in other disciplines (particularly in the organisation and in the role of the objects), contributing to the construction and transmission of knowledge in their own domains of study. Art collections are therefore included in the working typology provided above.

3.5 The epistemological nature of the typology

> Our scientific ideas are of value to the degree in which we have felt ourselves lost before a question; have seen its problematic nature, and have realised that we cannot find support in received notions, in prescriptions, proverbs, mere words. The man who discovers a new scientific truth has previously had to smash to atoms almost everything he had learnt, and arrives at the truth with hands bloodstained from the slaughter of a thousand platitudes.
>
> Ortega y Gasset, 1932

University collections have participated – and continue to participate – in the millenary adventure of knowing about ourselves and the world we live in. But what exactly does this mean? What roles do objects, specimens, artefacts, instruments play in research and teaching? What do collections represent?

Science addresses objective reality. It is information about the objective reality that researchers aim to gather and it is against the same reality that information is scrutinized. It is this creative, question-driven, hard, dynamic, repetitive and painstaking process of inquiry that generates knowledge. Sometimes, objects are crucial for this process: they are the very sources from which knowledge is derived. In other cases, objects are simply used in the inquiry process in order to get to the real sources. Science has two principle processes (or methods) of gathering information about objective reality and transforming it into knowledge: one is through observation and comparison and the other is through experimentation[39]. These two processes – often used in combination – are ultimately at the basis of the epistemological development of university collections.

Typically, disciplines such as zoology, botany, geology, mineralogy, microbiology, palaeontology, archaeology and anthropology, and, in part, medicine, astronomy, art, history and chemistry share a particular epistemological property: knowledge is constructed through direct observation and comparison of elements from reality. Or, according to Rudwick (1985: preface to second edition), these disciplines share "an interaction between theory-building and the accumulation of ever-richer stores of evidence". Collections are crucial because by

[39] A comprehensive overview of the comparative method in the life sciences is presented by Harvey & Pagel (1991). For the experimental method, there is a large number of publications in the philosophy and epistemology of the experimental sciences, encompassing different schools of thought and approaches.

accumulating artefacts and specimens they enable comparison to what is already known and without which our understanding would have little or no significance. As Prieur *et al*. (2003: 37) noted in the case of palaeontology: "L'étude du fossile nécessite une référence à l'actuel et inversement". Research collections are never obsolete because the potential for comparison is maintained as long as the specimen and corresponding documentation are preserved. Research collections are and will remain important for researchers for the construction of present and future knowledge. They materialise present processes of knowledge – in botany, zoology, archaeology, pathology. In addition, if a research collection is old, it can *also* document past knowledge and its processes.

In physics and its derived sciences (geophysics, meteorology, biophysics), and in part in mathematics, engineering, chemistry, astronomy, and others, the epistemological process is generally different. Knowledge is created not by accumulation of elements from reality but by experimenting with reality. Contrary to a collection of rocks or bird skins, instruments are not supposed to 'represent' reality, but basically to measure it (e.g. thermometer, galvanometers, voltameters), to perform calculations (e.g. calculators, computers), to simulate it (e.g. mathematical models), or to perform an act (e.g. a telescope to observe, a motor or machine, a surgical instrument, a demonstrative model). Scientific equipment acts as an intermediate between the researcher and the reality he or she is experimenting with.

Fig. 3.21 - Research collection of comparative osteology at the Laboratory of Human Palaeontology, University of Turin. These are reference collections of mammal bones for archaeozoological research, organised by type (mandibles in the left drawers, phalanges on the right). During excavations it is often difficult to identify bones; they are frequently incomplete or damaged. After being cleaned, the bones are brought to the Laboratory for identification by direct comparison with reference collections (photos reproduced with the kind permission of the Laboratorio di Paleontologia Umana, Dipartimento di Anatomia, Farmacologia e Medicina Legale, University of Turin).

Instead of reference, the crucial property of these instruments is their reliability and performance in intermediation: they are expected to measure well, calculate well, demonstrate well, and test well. If they do not and neither serve any other experimental purpose, they are thrown away and replaced by better ones. With time, this equipment inevitably acquires historical value and may constitute historical research collections (as long as someone takes the initiative to keep and protect them). These collections document

processes of past knowledge – in physics, astronomy, engineering, etc. More often than not the objects bears tangible marks of the processes of knowledge, as I will illustrate in the next chapter.

Fig. 3.22 – Storage at the Museum of Science, University of Porto. A second generation university museum, it incorporates historical teaching and research collections from the departments of physics, mathematics and chemistry of the Faculty of Sciences. The collections are mostly from the 19th and 20th centuries and the Museum preserves an early 20th century chemistry laboratory. Collections have been largely restored and inventoried and the Museum has developed temporary exhibitions. See also Araújo (1998) and Santos & Araújo (2003) (photo reproduced with the kind permission of the Museum of Science, University of Porto).

Although some sciences (disciplines) are more easily identifiable with the comparative method (e.g. biology) and others with the experimental method (e.g. physics), it is important to put the emphasis on the process. It is not so much the science that is comparative or experimental, but the method. Zoology may have comparative and experimental processes, as physics may have comparative and experimental processes. Both can use objects as sources or as intermediates. Zoology uses instruments too – microscopes, thermometers. Astronomy uses equipment (telescopes, lenses, mirrors), but also reference collections – for example collections of photographic plates. These plates are records of astronomical observations, intensively used since the invention of photography, but gradually declining with the introduction of new techniques such as the CCD camera. These collections have not become obsolete for research given that in astronomy it is crucial to have records of observation over the largest time span possible (Bernardi *et al*. 2004)[40]. The same happens in particle physics with the targets bearing the traces of collision of particles in accelerators – they are identified, described, accumulated, and data is compared, treated and crossed with data from equipment. Chemistry also uses reference collections of chemical preparations, arranged in series like reference collections of botany or archaeology. Perhaps the best example is medicine and its many specialities. There are two major groups of university collections of medicine: a) the collections of real specimens – better known as anatomy, pathology, and embryology collections, etc. – and b) the collections of historical instruments – better known as surgery, ophthalmology, and dentistry collections, or more generically, collections of the history of medicine. More than materialising the history of ideas, research collections and historical research collections materialise *how* we know – in medicine, physics, botany, archaeology.

[40] The Astronomical Observatory Pino Torinese, at the University of Turin, is presently restoring its collections of photographic plates for contemporary research (Bernardi *et al*. 2004).

Teaching collections cover a wider range of disciplinary subjects. Almost all disciplines can assemble teaching collections. Observing, touching, handling, feeling, assembling experiments, and often cutting, testing, opening to see what is inside, is more beneficial – even essential – to the cognitive process than looking at illustrations in a textbook. Moreover, scientific ideas may be conveyed by words, but processes are harder to catch in words because they involve practices and *savoir faires*.

Fig. 3.23 – Teaching collections at the Department of Earth Sciences, University of Oxford. The room is full of drawers and showcases containing geological specimens and supporting documentation (maps, etc.) (courtesy Department of Earth Sciences, University of Oxford).

Fig. 3.24 – Same room as in fig. 3.23. Teaching collections are closely connected to curricular topics and year of studies. On the left image, the drawer corresponding to the course of 'Geology, 3rd Year, Revision Practical I'. Inside the drawer (right image) is a collection of 15 specimens and a sheet of paper with a brief description. In this case, specimens do not have any other documentation. The 'scientific' value of specimens is irrelevant, although they are certainly all *real* specimens. What counts is a) certain illustrative features; b) the fact that they are grouped together in a drawer, allowing certain comparisons; and c) the links to a given curricular content (courtesy Dep. of Earth Sciences, University of Oxford).

On the one hand, in universities teaching is *de facto* teaching *for* research, thus teaching collections are often difficult to distinguish from research collections[41]. On the other hand, students are being initiated, therefore reality often needs to be somehow simplified. Moreover, often subjects are too big or too small, or too short or too long, or too abstract, to be grasped without modelling and simulating. Teaching collections typically have simpler organisational criteria than research collections, ones that make a given point more immediately evident to students. Therefore, across almost all disciplines, from zoology, to archaeology, from anatomy and pathology to mathematics, physics, and engineering, objects are deliberately organised and arranged in collections to simplify an explanation, to provide an analogy, to illustrate or demonstrate a particular point, or to simulate reality (see figs. 3.23-24). Teaching collections and historical teaching collections materialise the processes of transmission of knowledge – in present day and in the past.

In short, research and historical research collections materialise present and past processes of research (comparative processes of inquiry and experimental processes of inquiry, respectively). Teaching and historical teaching collections materialise present and past processes of teaching. Together, they constitute material evidence of the history of knowledge. A better understanding of these ideas will derive from the origins of university collections in the next chapter. The shift of focus from disciplines and sciences to processes of knowledge has implications for the preservation and contemporary significance of university collections, as well as for their interpretation for broader segments of the public.

3.6 Summary

Understanding university museums and collections means first and foremost taking into consideration their academic context. Understanding university museums and collections also means reducing their complexity distinguishing between the multiple levels that influence them. The diversity of university museums and collections is staggering and encompasses:

a) diversity in disciplines and types;
b) terminological diversity, from a multiplication of terms – e.g. museum, gallery with and without collection, herbarium, and archive – to often divergent uses of the same term – e.g. museum;
c) the coexistence of museums and non-institutionalised collections;
d) diversity of size and management models;
e) diversity of purposes: collections assembled for teaching, research, public display, and also collections resulting from the accumulation of university memorabilia and art;
f) diversity of positioning within the university structure, resulting in diversity of autonomy models: museums and collections under departments, under faculties, under libraries, under the university executive board (rectors, vice-rectors, etc);
g) diversity of public and users: university collections can be used by researchers and students, they can be open to the general public and they can have no use at all anymore (orphaned).

Breaking down this complexity necessitates distinguishing between the level of the collection (which is to be considered the main and inclusive unit), the level of the museum, and the level of the university. Each one of these three levels raises specific issues that, although obviously not unrelated, are more easily understood if treated separately. The *collection* level encompasses issues such as teaching and research, collection management and organisation, the role of objects and their relevance and significance. In addition, the *museum* raises another level of issues, for instance the role of the general public, staff and training, professional standards, institutional identity, autonomy, management, etc. Finally, given that

[41] It is this close articulation that essentially distinguishes university collections from a) collections in secondary schools and lycées (mostly teaching) and b) collections in research laboratories and other museums (mostly research).

both collections and museums normally have limited or no autonomy, a third level needs to be taken into consideration, i.e. the relation between the collections and museums with their parent institution. This layer also brings up specific issues, such as institutional commitment, legal status, positioning within the university structure, status and recognition, mandate, etc.

In this chapter, definitions for the terms ‘museum’ and ‘collection’ were established, as well as the sense in which the terms ‘research’ and ‘teaching’ are employed. The role of the object in university collections was reflected upon. A working typology of university collections was proposed, based on the processes of collecting and the epistemological nature of the different disciplines. These were categorised in a) teaching collections; b) research collections; c) historical teaching and research collections; and d) collections of university history. In the following chapters, I will often refer to a) and b) as first generation university collections and to c) and d) as second generation university collections. University art collections present considerable classification challenges, although many can be grouped in categories a) and b). This is not a classification system and it is far from ideal. The proposed typology is empirical, based on the role of objects, aimed at examining the history and development of university collections and enabling the reflection on their distinct nature.