

# A collection of inordinate number and diversity

# 07

Opposite: *Gloriana ornata*, a spectacular noctuid moth from India that resembles dried leaves when at rest, from the C.H. Schill World Lepidoptera collection.

Below: View of an insect collection area in the Manchester Museum.

Of the hidden treasures at the Manchester Museum, the collection of arthropods deposited in the Entomology Department is exceptionally important both in terms of number and diversity. This is hardly surprising, as more than three out of four of all animals on Earth are arthropods. These are invertebrate animals (meaning

they lack a backbone) with external skeletons, segmented bodies and six or more jointed legs. Some of the most familiar arthropods are insects, spiders, scorpions, centipedes, millipedes, shrimps and crabs. The Museum's arthropod collections are among the top three in the UK, totalling about two and a half million specimens, as well as associated documentation such as card indexes, field notebooks, correspondence files, and diaries. Particular strengths include the worldwide collections of butterflies, beetles and earwigs.

One of the first questions that may occur to a visitor to the Museum's Entomology Department is: what is the use of having all these specimens? The collections are so large that their full diversity is impossible to display. A quick answer is that all these specimens constitute an essential archive of research. Thousands of specimens retained in the Department are examples of organisms collected in the course of taxonomic or biodiversity research. They are called 'voucher specimens' and are physical proof that species have been recorded from the studied site



Without [collections], there could be no more Entomology than there could be science without books.

John Lubbock (1856)

Right: The giant spider crab (*Macrocheira kaempferi*), the largest living arthropod from the collection of marine Crustacea (c.540 species) deposited in the Manchester Museum. This crab occurs on the sea bed off Japan at depths of 200–300m. Males of these crabs weigh up to 20kg, and their leg span can reach 4m.



and identified accurately. Every specimen represents an essential and irreplaceable source of information for research, aiming to answer three fundamental questions: *what* is the organism under study, *where* is it found in nature, and *why* is it found there? Without such reference collections, acting as a kind of 'biological library', most taxonomic, biodiversity or conservation research cannot be conducted.

The origin of the Manchester Museum's arthropod collections dates back to the foundation of the Museum by the Manchester Society for the Promotion of Natural History in 1821 (see p. 12). The oldest insect specimens in the



Museum are the beetles collected by William Kirby (1759–1850), the founder of English entomology, and described by Thomas Marsham (–1819) in his *Entomologica Britannica* in 1802. The original arrangement and nucleus of the Museum's entomological collections was assembled by John R. Hardy (1844–1921), who was appointed as a 'Senior Assistant Keeper and



Left: The pill-beetle, (*Cistela maritima*), described in 1802, the oldest insect specimen at the Manchester Museum.

Below: The elephant beetle (*Megasoma elephas*), one of the largest beetles on Earth, known from the lowland rainforests of Central and South America. Males can reach the length of 120mm and their weight can exceed 50–70g.

### The Manchester Moth

The most famous specimen in the Entomology collection is the celebrated Manchester Moth (*Euclementia woodiella*). It is a tiny, delicate moth, with a wingspan of less than one centimetre. Only three specimens of this moth are available today: in the Melbourne Museum (Australia), in the Natural History Museum (London), and in the Manchester Museum. The Manchester Museum's specimen is badly damaged, with most of its legs, right antenna and half of the abdomen missing, and with the right forewing torn apart. Here we present an accurate reconstruction of the moth. The Manchester Moth remains an unsolved scientific conundrum. Originally, in June 1829, a series of 50/60 specimens was collected by the amateur collector Robert Cribb from Kearsall Moor (Salford, Greater Manchester). He gave one specimen to John Curtis (1791–1862), an eminent authority on insects, who described the moth as a new species in 1830. Two specimens of the moth were also given to the local collector S. Carter. Unfortunately, the storage box containing the rest of specimens of the original series was destroyed by Cribb's landlady in revenge for rent arrears. Since then, nobody else has been able to collect any further specimens, and the moth has not been seen alive. It is believed that this species does not occur outside Britain and is now most likely extinct.



Above: A reconstruction of the Manchester Moth.

Below: A unit-tray of Morpho butterflies from the C.H. Schill World Lepidoptera collection.



Entomology  
Curator' in January

1908. He also obtained a

great deal of exotic material, of which

the C.H. Schill collection of butterflies and moths was particularly important. This worldwide collection is a real treasure of the Museum. It includes some 40,000 specimens of over 8,000 species from all families of butterflies, larger moths and tiny moths commonly known as micro-Lepidoptera (i.e., having a wingspan of less than one centimetre). The collection contains some currently threatened or extinct species, for instance the Sloane's *Urania*, one of the most spectacular day-flying moth species that was endemic to the island of Jamaica. The moth was last reported in 1894 or 1895, and most probably disappeared due to habitat loss when Jamaica's lowland rainforests were cleared and converted to agricultural land.

The Manchester Museum holds a comprehensive collection of British insects totalling some 720,000 specimens of 13,845 species, and overall accounting for about 60% of all the insect species recorded in the UK. It is the finest collection of British insects in the North-West, which is regularly consulted by local entomologists and university students. The person primarily responsible for building it up was Harry Britten (1870–1954), a self-educated ex-railwayman without a formal academic background, who became recognized as one of the greatest British entomologists in the 20th century. During his keepership (1919–38), Britten paid particular attention to the so-called ‘critical groups in entomology’ (parasitic wasps, true flies, bristletails, lice, and some others) which were lacking at the Museum and were largely ignored at his time by other entomologists. His abilities as a field naturalist and his manipulative skills in dissecting and mounting insects were legendary. He devised an original method of ‘side mounting’ of specimens,



Right: A specimen of the crane fly (*Tipula vernalis*) mounted and labelled by H. Britten.

Below: Four colour morphs of the Scarlet Tiger (*Callimorpha dominula*), a scarce British species represented by 20 specimens in the collection of J. Sidebotham.

each with a neat handwritten label, so that many thousands of the specimens mounted by him are easily recognizable in the collection.

In 1919, Britten acquired Joseph Sidebotham’s collection of butterflies and moths (1,867 species), a good example of the Victorian private entomological collection. Sidebotham (1824–85) was a calico printer and JP. His interests ranged from botany and entomology through astronomy and photography. He also collected diatoms (a group of single-celled or colonial algae having cell walls composed of silica) and was one of the founders of the Manchester Field Naturalists’ Society. All his specimens are superbly mounted, reliably identified and are in perfect condition. However, only a few of them contain locality labels. It is known nevertheless that the majority of specimens in the Sidebotham collection were collected in Britain in the late 19th century, but some might have originated from France. Since that time several species have already



become extinct in the UK, for instance the Large Copper butterfly and the Large Blue.

Another important Museum collection acquired by Britten is the world collection of Swallowtail

“I really enjoyed looking at the spiders ... the thing that I loved most was drawing on the hairy detail.”

Raquel (aged 9)



Above: The Sloane’s Urania (*Urania sloanus*), an extinct species of which only three specimens are deposited in the Manchester Museum.

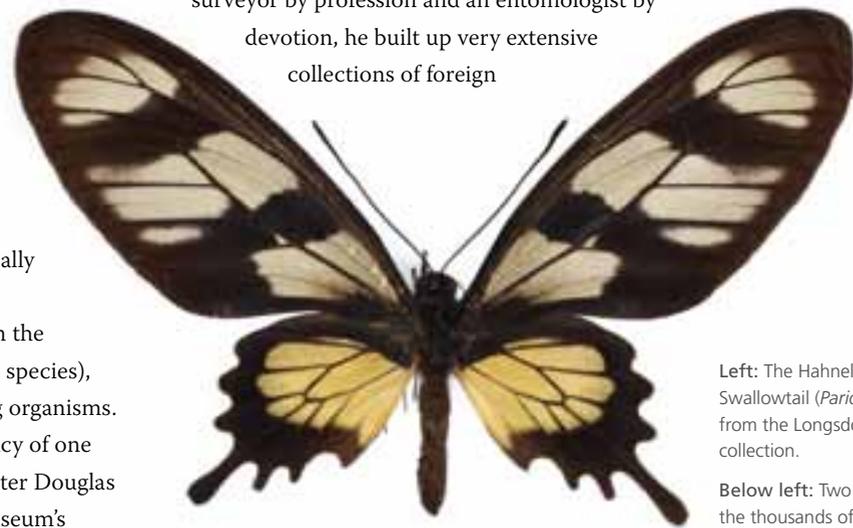
Left: Harry Britten, the former Keeper of Entomology of the Manchester Museum, at the time of his presidency of the Manchester Entomological Society (1922–3).



butterflies, which was received by bequest of David Longsdon (–1937) in 1937–8. It is not only a valuable collection from a scientific point of view, but also has considerable monetary value. The collection contains more than 9,200 specimens representing practically all known species of Swallowtail butterflies. It is nicely organized and rich in data (labels are dated from 1890 to 1936) and contains lots of rarities, such as a series of six specimens of the Hahnel’s Amazonian Swallowtail, known from only a few localities of central Brazil.

By far, the largest and most scientifically important are the Museum’s collections of beetles, the largest group of animals in the world (in terms of numbers of described species), representing one fifth of all known living organisms. Our beetle collections represent the legacy of one of England’s greatest entomologists, Walter Douglas Hincks (1906–61), who began as the Museum’s

Assistant Keeper in Entomology in 1947. Hincks wanted to make the Entomology Department the finest reference and study centre in the North and thus his keepership (1947–61) saw massive improvements to the collections. With his friend John Dibb (1906–73), who was an insurance surveyor by profession and an entomologist by devotion, he built up very extensive collections of foreign



Left: The Hahnel’s Amazonian Swallowtail (*Parides hahneli*) from the Longsdon butterfly collection.

Below left: Two of the thousands of type specimens of the Manchester Museum’s collection of tortoise beetles (Cassidinae), *Meroscalsis dohertyi* (left) and *Lorentzocassis papuana* (right).



### Dodo of the earwigs

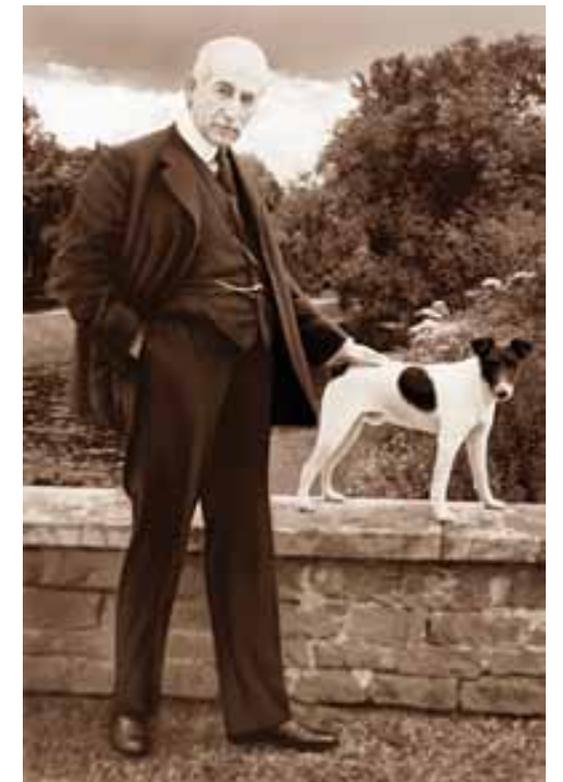
The Entomology Department retains specimens of a number of extremely rare or already extinct insects. One of them is the magnificent Giant Earwig (*Labidura herculeana*), of which the Museum holds only two specimens, a male and a female. The giant earwig is the world’s largest earwig, and derives from the small volcanic island of St Helena in the South Atlantic. Its body length ranges from 36 to 54 millimetres. The largest known specimen is a male of about 78mm long. The creature is also known as the ‘Dodo of the earwigs’, since it was endemic to a small island and is likely to have become extinct. Fundamental reasons for its disappearance seem to have been the clearing of the Gumwood forest where the species occurred and its predation by introduced animals, particularly by the large centipede (*Scolopendra morsitans*) and mice. Since 1967, when the earwig was still reasonably common, it has not been seen alive, though three unsuccessful expeditions have been organized and sponsored by the London Zoo in order to find and rescue it. However, the earwig has entered into the folklore of St Helena, and many people believe that it is still living out there somewhere.



Above: Male and female of the giant earwig.

Right: Robert W. Lloyd, the merchant and philanthropist whose exceptional generosity allowed the Manchester Museum to acquire the unique collection of tortoise-beetles.

beetles from all over the world. These collections came to the Museum at varying times through Hincks. One of the most important acquisitions he made was the worldwide collection of tortoise-beetles (Cassidinae) of the late Franz Spaeth (1863–1946), the main world authority on the group at that time. The collection was built up by Spaeth for nearly half a century and contained more than 20,000 beetles, including some 3,000 type specimens. It was the finest private collection of the group, exceeding in scientific value those of all European museums. The collection was purchased by the Museum in 1950 through the financial assistance of Hincks’ friend, Robert W. Lloyd (1868–1958). Lloyd also bequeathed his personal collections of European beetles and butterflies



and his extensive library of rare and antiquarian entomological books to the Entomology Department. In addition, his fine collection of Japanese lacquer, ivories, metalwork and weapons was bequeathed to the Manchester Museum's Living Cultures department (see p. 50).

Of the more exotic insect groups, one might be surprised to know that the Manchester Museum possesses the most comprehensive earwig collection in the world, with more than 11,000 specimens representing 975 species, which is about half of the earwig species known worldwide. The original collection of the late W.D. Hincks was purchased by the Museum in 1961, and formed the nucleus of the earwig collection. It was subsequently significantly extended by Alan Brindle (1915–2001), Hincks' successor in the post of Keeper of Entomology and an outstanding entomologist himself, during the course of his extensive 30-year taxonomic research on earwigs. More importantly, Brindle improved the scientific quality of the Museum's earwig collection by adding type specimens of hundreds of new species he described. A species of special importance in this collection is the extinct giant earwig from the island of St Helena (see p. 91).

The scientific quality and international reputation of any natural history collection is measured by the number of deposited type specimens. A 'type specimen' (or 'type') is a reference specimen selected by a scientist during the description of a new species. Type specimens serve as the primary and unique references for all known species names. They play a key role in stabilizing the use of species names. The Entomology Department holds more than 12,000 type specimens representing some 2,500 species names of primarily foreign insects. This makes the Manchester Museum one of the most important entomological depositories in the UK.



Above: The holotype of *Pseudacanthus nigridioides*, a species of bess beetle described by W.D. Hincks in 1949.

“I think my nine-year-old son would like to work here one day.”

Museum visitor

## Entomology

## Expert spotlight

A lot of my research is on the interactions between plants and insects. One of the questions I ask is 'how does the variety of plant species in an area affect the variety of insects?' In the tropics those plant communities might consist of a few giant mahogany trees and all the thousands of epiphytes growing on them. In the UK the plant community of interest may be a wildflower meadow. In both cases we collect hundreds of thousands of insects on and around the plants and look to see how many species there are and how many individuals there are of each species. We use this information to make estimates of biodiversity, and these estimates are completely dependent on our ability to identify all of the insects that we collect. The reference collections in the Manchester Museum, and the expert knowledge

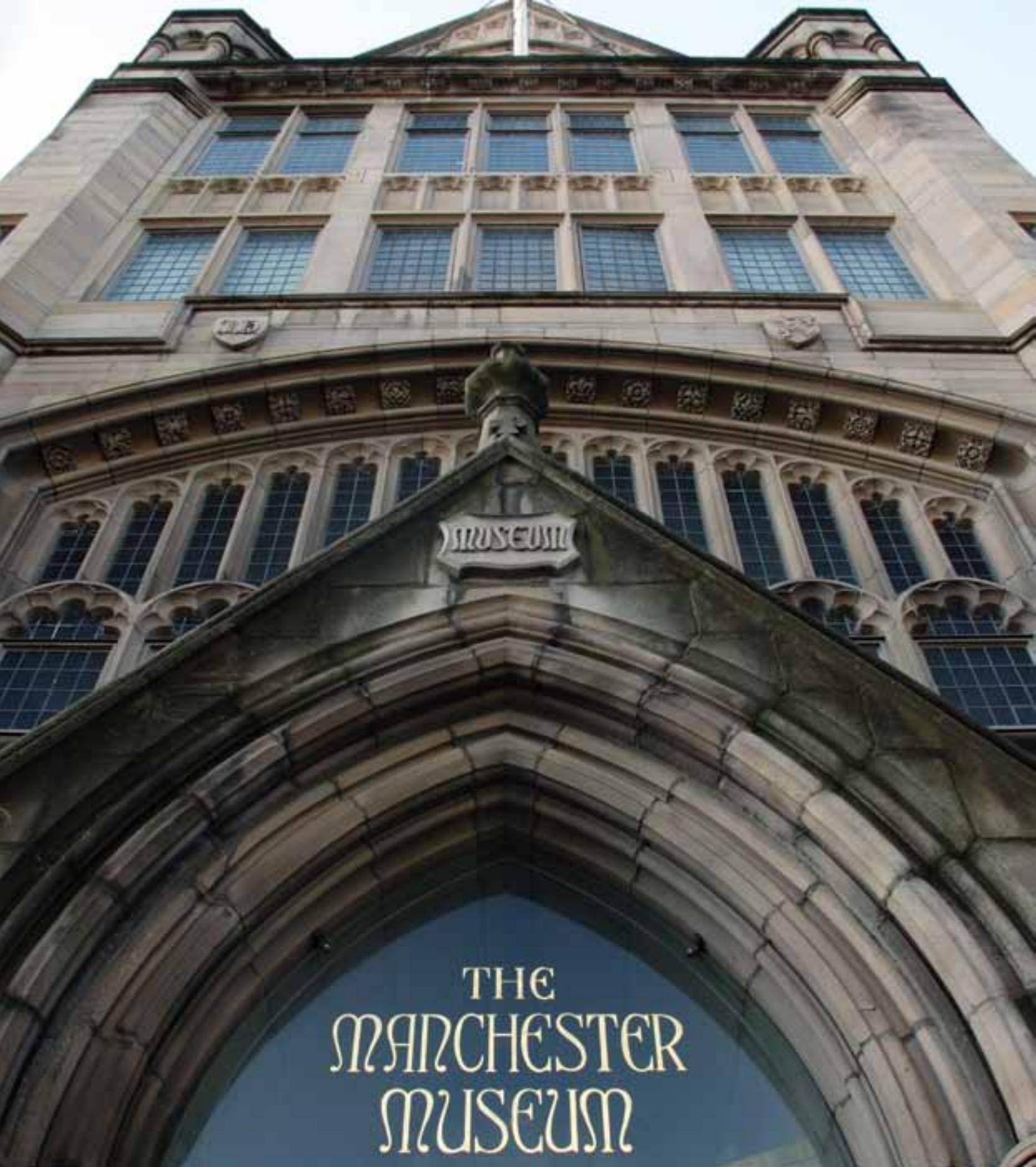
of the curators who so diligently maintain those collections, are an invaluable resource for my research. For example, the discovery of a new species of beetle in the rainforest is only really possible once we can define what has previously been found and identified, and to do this requires the resources of a museum. The Manchester Museum represents a core asset of the University, one of those things so central to what we do that we sometimes forget how much we depend on the expertise it provides. Access to places like the Museum have enabled us to be the centre of learning that we have become.

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## The Manchester Museum: Window to the World

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