

## COLLECTION OF OUTSTANDING FOSSIL AND MINERAL SPECIMENS

INFORMATION SHEET 5 (CASES 73, 74, 75)

The three central cases (73, 74 and 75) in the main hall of the museum contain outstanding fossil and mineral specimens that are grouped according to various criteria, including exceptional preservation in the case of fossils, or size, brilliance, colour and/or extraordinary habit in the case of minerals. These properties render the specimens unique, and hence they are displayed separately from the general collections. This information sheet describes five each of the fossils and minerals exhibited in these cases.



**CASE 73  
SILICATES**

Beryl is a relatively uncommon mineral in nature, and transparent crystals are even rarer. In these cases, the crystals can be cut to obtain precious gems that may be green (emerald), yellow (heliodor) or blue (aquamarine). In this specimen, the aquamarine crystals form perfect hexagonal prisms embedded in a "mat" of mica (muscovite). This piece originally formed part of the wall of a miarolitic cavity (geodes found in granitic pegmatites).

Beryl (aquamarine) ( $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$ ).  
Gilgit (Pakistan).  
Maximum dimension: 17 cm.



**CASE 73  
PHOSPHATES**

Vivianite is a rare mineral that is usually found as crystals measuring only a few millimetres in size. Larger crystals like this one, measuring tens of centimetres, are extremely rare. Normally, vivianite forms as a result of the destruction of other, pre-existing minerals or in association with concentrations of phosphorus-rich organic matter. Although these crystals are now a dark greenish-blue colour, they were almost colourless originally. The change has occurred because this iron phosphate is unstable and has darkened over time.

Vivianite [ $\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$ ].  
Anloua (Camerún).  
Maximum dimension: 21 cm.



**CASE 74  
FISH**

*Priscacara* was a fish belonging to the osteichthyes (bony fish) group, and is equivalent to a present day perch. Bony fish account for nearly all the fish that we know and consume, such as hake, sea bream or sole. *Priscacara* originated in the Mesozoic seas, but over the course of its evolution it also began to occupy freshwater habitats. During the Eocene, it probably lived in streams and lakes, feeding on snails, crabs, prawns and tadpoles.

*Priscacara* sp.  
Eocene (45 million year ago).  
Wyoming (USA).  
Maximum dimension: 20 cm.



**CASE 74  
REPTILES**

*Mesosaurus* was a reptile that lived during the Permian, at the end of the Palaeozoic. Its fossils have been found exclusively in South Africa and South America, which led the German scientist Alfred Wegener to speculate that these two continents had been joined together in the past. Thus was born the theory of continental drift. *Mesosaurus* was small and had long jaws filled with fine teeth. Its elongated, streamlined shape would have enabled it to swim at great speed.

*Mesosaurus brasiliensis*.  
Permian (270 million years ago).  
Sao Paulo (Brazil).  
Maximum dimension: 40 cm.



**CASE 74  
PLANTS**

*Araucaria* is a genus of coniferous tree that remains extant today. It is named after Arauco, in Chile. The species *mirabilis*, to which the cone displayed here belongs, is extinct. It is notable for its reddish colour, which was caused by the conditions of preservation: the *Araucaria* trees were buried by ash from a volcanic eruption that occurred millions of years ago in what is now Argentine Patagonia. Over time, water filtered into the sediments and precipitated minerals with red hues.

*Araucaria mirabilis*.  
Jurassic (170 million years ago).  
Patagonia (Argentina).  
Maximum dimension: 9 cm.



#### CASE 74 ARTHROPODS: TRILOBITES

The trilobites are an extinct class of arthropods that inhabited the Palaeozoic seas for almost 300 million years. As with present day arthropods, trilobites grew by moulting their exoskeleton. As they grew bigger, they tore and shed their external carapace, emerging head first from the anterior region (i.e. the cephalon). This specimen is an example of a trilobite moulting, illustrating displacement of the cephalon as the trilobite emerges in its new carapace.

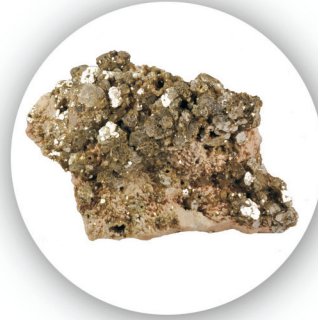
*Isotelus maximus*.  
Ordovician (440 million years ago).  
Ohio (USA).  
Maximum dimension: 17 cm.



#### CASE 74 ARTHROPODS: CRUSTACEANS

As with all the crustaceans, this extinct crab possessed a very hard, chitinous carapace. Its claws were very robust and generally of different sizes. It had walking legs on both sides of the body, but the existence of a fifth pair of flat hind legs suggests that this crab was also able to swim. It was carnivorous and is known informally as the "mud crab". It is thought that it was a deep water predator.

*Archaeogерion peruvianus*.  
Neogene (15 million years ago).  
Patagonia (Argentina).  
Maximum dimension: 25 cm.



#### CASE 75 SILICATES

Muscovite is perhaps the best known phyllosilicate. It is a white, silvery mica that is very common in igneous and metamorphic rocks. It is characterised by marked basal cleavage, meaning that the flakes easily come apart into thin sheets. Thus, very thin and transparent sheets can be obtained that are often highly flexible. Formerly, Muscovite was used for thermal insulation because it is a very poor conductor of heat. Consequently, it was used in clothes irons to isolate the hot plate from the handle, and in small stove windows. Its name comes from the former Russian province of Muscovy, where large sheets of this mineral were extracted. The specimen displayed here is exceptional because it shows the hexagonal shape of the crystals, which grew on top of a feldspar aggregate.

Muscovite  $[KAl_2(Si_3Al)O_{10}(OH)_2]$ .  
Itinga, Minas Gerais (Brazil).  
Maximum dimension: 26 cm.



#### CASE 75 SULPHIDES

Over 70% of stibnite, sometimes called antimonite, consists of antimony, but it also usually includes small amounts of gold, silver, iron, copper and lead. The crystals form elongated prisms with longitudinal striations. It has a metallic appearance and looks hard, but in fact the crystals are very delicate and soft (2 on the Mohs scale). This specimen is notable for its large size, the brilliance of its crystals and the unusual arrangement of the prisms.

Stibnite ( $Sb_2S_3$ ).  
Jiangxi (China).  
Maximum dimension: 20 cm.



#### CASE 75 NATIVE ELEMENTS

Although sulphur combines with oxygen and many metals, it can also be found in its native state, as pure sulphur crystals. This large specimen contains some excellent rhombic crystals, and presents the yellow colour typical of sulphur. It can be formed by the oxidation of sulphides or by the reduction of sulphates, and may also be induced by the biological activity of certain organisms. However, this specimen was generated by volcanic exhalations, which contain sulphur in the gases that are released by magma and rise through the Earth's crust.

Sulphur (S).  
Cattalinsetta (Sicily, Italy).  
Maximum dimension: 32 cm.