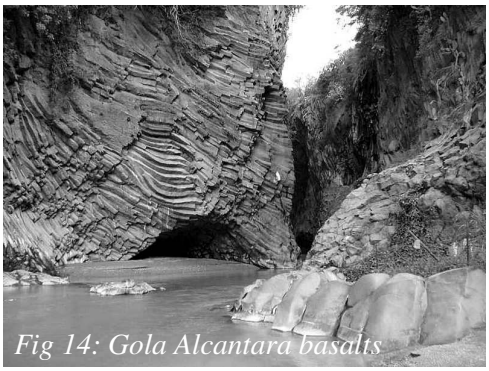


Fig 14: Gola Alcantara basalts

So there we have it, a really interesting week's holiday. I booked through 'Explore' and it is a trekking holiday but well within the capabilities of anyone able to do a day's walking in, say, the Lake District. I just hope you have better weather, and then you will be taken up to the summit crater of Etna. Beware of the mud pool though; your swimming costume will smell of sulphur for at least a year. Mine has.

Photos by the author except Figs 3 and 9 which are by Alison Chapman

WUHAN BONSAI GARDEN AND ROCK MUSEUM

Linda Drummond-Harris

Wuhan, capital of Hubei Province, straddles the confluence of the Yangtze and Han Rivers about halfway between Shanghai and Chongqing. It is a popular destination on many organized China tours and among its attractions is a curious bonsai garden and rare rock museum.

Its exhibits include a *Platybelodon* skeleton (probably re-constructed from several partial skeletons) an assortment of massive rocks and galleries of glass cases containing a collection of specimens. Many of these are unique and finely figured, often artistically prepared and mounted and some even exquisitely carved. All, of course, are labelled in Chinese, so identification (for me) was rather hit-and-miss. The most spectacular specimens in my opinion were the chrysanthemum rocks – white star-burst crystals in a black limestone matrix. The largest crystal on display was a giant chunk of quartz the size of a small car.

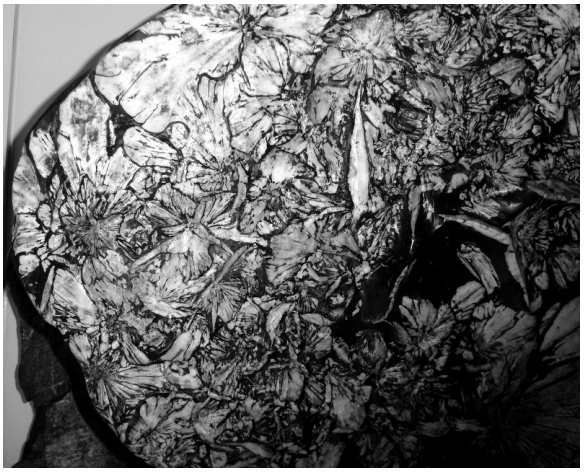
PLATYBELODON

Platybelodon ("flat-tusk") was a genus of large herbivorous mammal related to the elephant (order *Proboscidea*). It lived during the Miocene Epoch, about 15-4 million years ago, and ranged over Africa, Europe, Asia and North America. Although it thrived during its time, it did not survive past the Miocene and is now extinct. Some have speculated that it became too specialized and was unable to adapt to changing environmental conditions. It was previously believed to have fed in the swampy areas of

grassy savannas using its teeth to shovel up aquatic and semi-aquatic vegetation. However, wear patterns on the teeth suggest that it used its lower tusks to strip bark from trees. *Platybelodon* was very similar to the *Amebelodon*, another gomphothere species. Another possibility is that it used its shovel-tusks to dig for water in dry seasons. (*Source: Wikipedia*)

CHRYSANTHEMUM STONE

The Chrysanthemum Stone of Hunan, China occurs in the Qixia formation of the Lower Permian of the Yangtze River Valley. As the

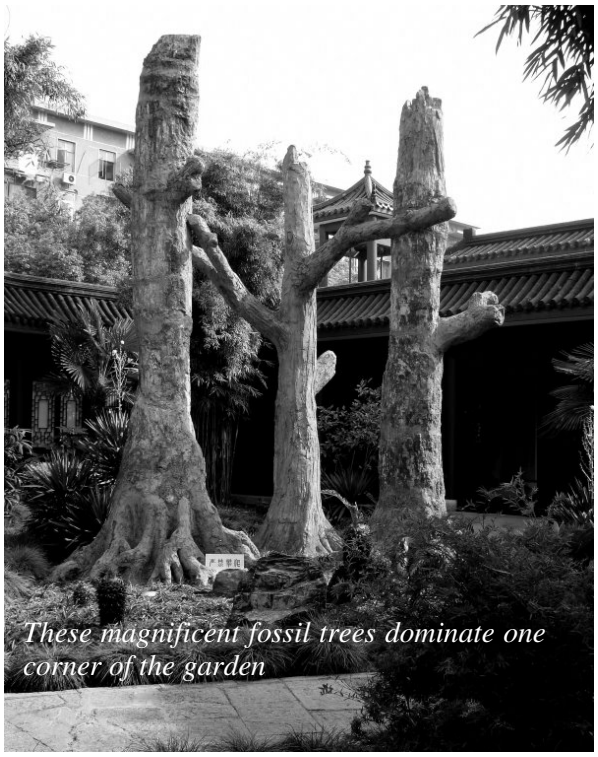


name implies, it is shaped like a Chrysanthemum - the official symbol of the Imperial Family of China. The "flowers" are embedded in dark grey limestone with calcite, andalucite or celestite constituting the "petal". Normally the diameter of the flowers ranges from 5 to 8cm, to a maximum of 50cm. The "flowers" are varied in shape with their petals stretching out freely in different attitudes. The "Chrysanthemum Stone" contains more than ten kinds of trace elements, such as selenium, strontium, gold, silver and bismuth. The Chrysanthemum symbolizes longevity in the Chinese culture.

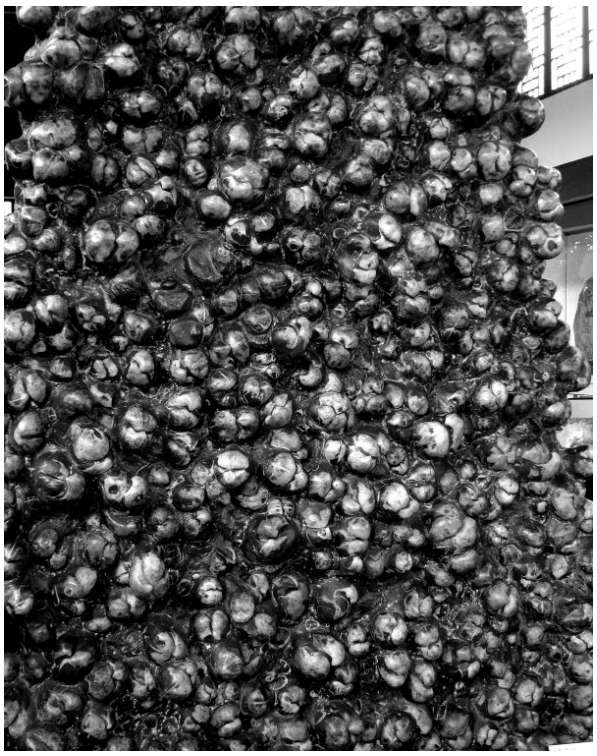
Close-up of 'chrysanthemum'

Carved specimen

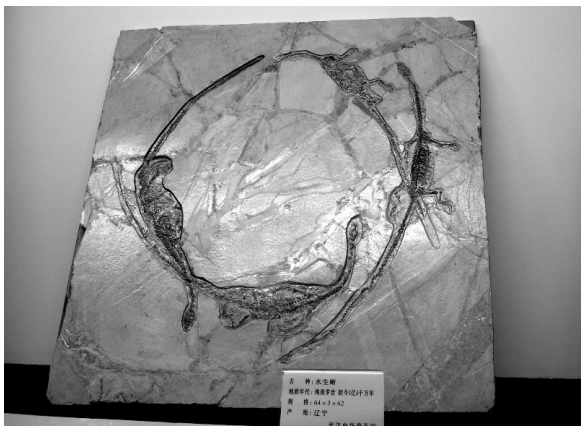
MORE EXHIBITS AT THE BONSAI GARDEN AND ROCK MUSEUM



These magnificent fossil trees dominate one corner of the garden

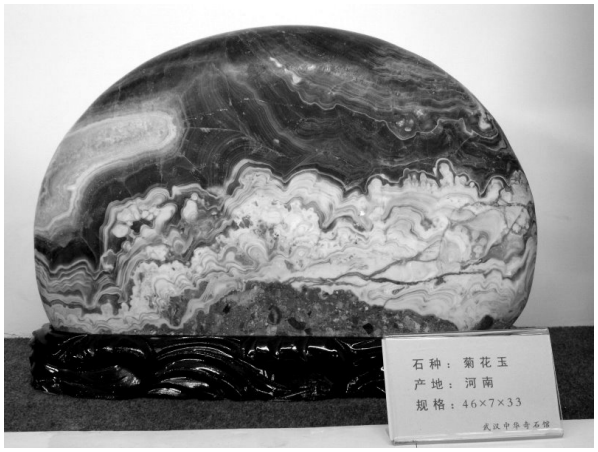


This is part of a huge slab (approximately 2.5m tall). The nodules look like large barnacles. Could they be some sort of bivalve?



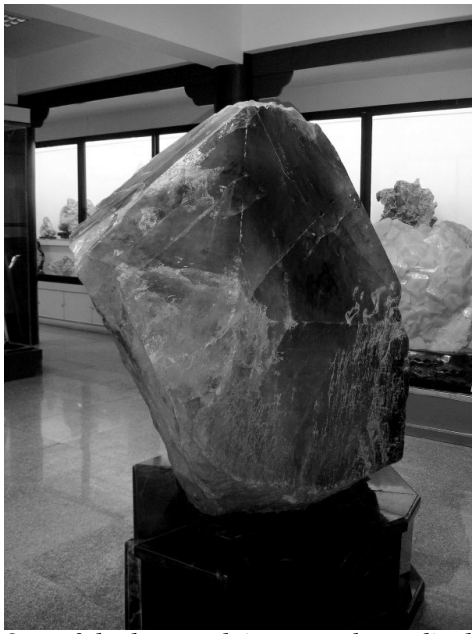
Could these be baby dinosaurs playing tag? One of the many curiosities on display.

Enlarged view of above



This polished and mounted rock is extremely complex in composition. The lightest part of it resembles Cotham marble.

Shaped like the head of a sea-horse this verdigris-coloured exhibit looks like the by-product of a copper smelting operation.



One of the huge calcite crystals on display.

A fascinating exhibit: black centres surrounded by honey-coloured layers.

Photographs by L Drummond-Harris

GEOLOGICAL HOWLERS - AGAIN

ON DEFORMATION:

- *Fault Y is a reverse fault due to the downthrown side being forced up.*

- *This is a normal reverse fault and the ground has been thrust 25m – well that covers many of the fault types so one of them must be right!*

- *The fold symmetry was described as*

  Equilateral
  Yes
  Good

ON EARTHQUAKES:

- *Earthquakes sometime cause buildings to liquifact.*

- *Earthquakes can be stopped by bombing the faults*

Two items adapted from Sunday Supplement articles

GIANT CRYSTALS

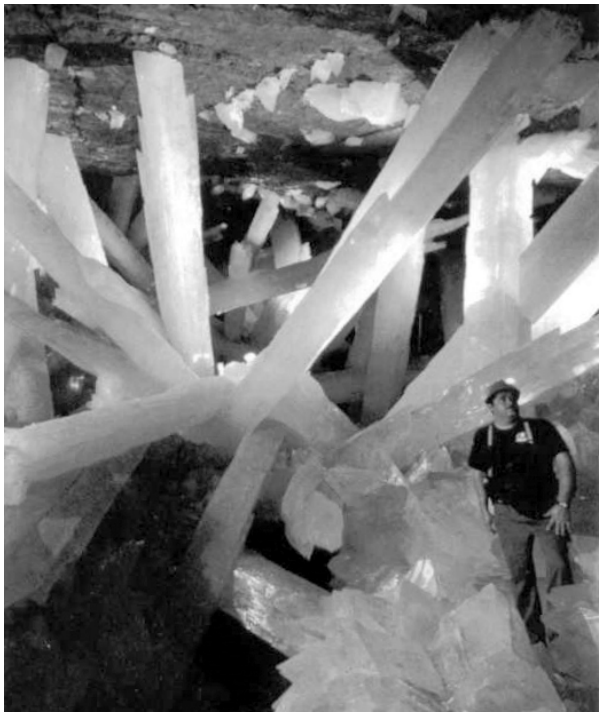


Photo: Javier Trueba (Science Photo Library)

This photograph was taken in a 290metre-deep cave in Cueva de los Cristales, Naica, Mexico. The giant translucent gypsum crystals are among the largest in the world and scientists believe they were formed by subsiding volcanic activity which kept the temperature at 58°C - the transition temperature between anhydrite (pure calcium sulphate) and gypsum (calcium sulphate dihydrate) – for hundreds of thousands of years. This created the perfect conditions for growing large crystals very slowly.

VOLCANIC ASH USED IN DATING TECHNIQUES

Dramatic volcanic eruptions, such as that of Pompeii, have frozen entire communities in time and it is possible that volcanic ash (tephra) may be used to date other sites. Tiny particles are carried hundreds of miles from the site of an eruption. Volcanic glass from Iceland was recently found in a lake in Switzerland. If it is possible to identify from which volcano the tephra came then any two sites containing the same volcanic glass will be contemporary and if the date of the eruption is known then the presence of the particles can be used as a dating technique.

The particles are usually smaller than 100 micrometers and can be chemically interrogated by electron microscopy in its chemical probe mode to provide an analysis of the major and minor elements present – typically silicon, aluminium, potassium, sodium, calcium, iron, magnesium and manganese. In this way a chemical fingerprint of the glass can be obtained and compared with material from other sites and from the parent site.

One drawback of this technique of tephrostratigraphy – linking two different sites in time due the presence of similar tephra – is that major volcanoes can erupt relatively frequently, perhaps once every 200 years, and produce chemically similar ash. For this reason finer techniques are being investigated for characterizing volcanic glasses, looking at trace element compositions and isotopes of rare elements such as strontium and neodymium. Accurate measurement of these elements would provide a more detailed chemical fingerprint of the glass, distinguishing between different eruptions. Whilst this is theoretically feasible it is technically quite tricky. The aim is to carry out single grain analysis, which is hindered by the microscopic size and texture of the glass grains. There is very little surface area to analyse.

Artist's impression of the eruption of Mount Vesuvius which destroyed and preserved the city of Pompeii. (Science Photo Library)