

Highlights and History of the Mineral Collection at the NHM in London

Mike S. Rumsey

A number of books and articles have been written about the origins of the Natural History Museum in London and its mineral collections, so only a the key points are outlined here. The collections were first formed by Hans Sloane (1660-1753). A man from humble origins born in Killyleagh, Co. Down, Ireland, who as a child had *"been very much pleas'd with the study of plants and other parts of nature"*. Sloane moved to London when he was 19 in order to study medicine and he completed his degree at the University of Orange in Provence, France *"to great applause"*. Shortly after he was given the opportunity to travel to the exotic island of Jamaica as the personal physician to a British nobleman and whilst he was there, he started to collect, draw and document objects from the natural world, and it seems these actions consolidated his childhood interests, and lead to a lifetime of collecting.

By 1727, Sloane had mastered his profession and was appointed the Physician in Ordinary to King George II. His scientific exploits were also noted with his election to the prestigious Royal Society in the same year. Throughout this time Sloane's growing professional reputation and wealth had enabled him to diligently build a collection containing all manner of curious things. On his death in 1753 aged 92, he asked that the whole collection be bought by the King for a total of £20,000 to ensure that it was kept together and made available to the nation. The money was raised and on Thursday 7th June 1753, the King attended parliament to give his assent to the act that established the Sloane Collection, along with two lesser manuscript and book collections as the foundations of the British Museum.



Fig.1. Sir Hans Sloane.

The collections at the British Museum grew so large over the next century or so, that by 1881 the portion of the collections that were dedicated to Natural History were split from the rest and housed separately. This 'sister institution' became the "British Museum (Natural History)", and the famous Waterhouse building in South Kensington, now a well known London landmark, was built to house the collections (Fig. 2). A further hundred or so years on and this is still the building that houses curators and collections today, although the name "British Museum (Natural History)" has been replaced by the "Natural History Museum".

Over 250 years has enabled the Natural History Museum to amass a number of significant treasures and highlights within its extensive 180,000 piece mineral collection. Over the following few pages a small selection of significant pieces will be discussed and figured. These will be used to highlight the different types of material within the collection, and the wildly different reasons that these particular specimens, suites or collections are considered to be notably important to the NHM, British culture and the discipline of mineralogy.

In 2007, the museum opened a new permanent gallery at the far end of the systematic mineral display called "The Vault" (Fig. 3). It was designed to showcase some of the treasures of the mineral collection, focusing on objects that were not only beautiful, but also those that had stories associated with them and would appeal to the public. The gallery raises the profile of both the systematic mineral collection and champions the study and appreciation of mineralogy, gemmology and geology within the UK. Many of the specimens covered here can be seen on display in this gallery.

However, a great many significant mineralogical treasures are not suitable for display in this public gallery, one of which, the first object featured here is the only treasure highlighted in this article that can be directly linked to the museums 'founder', Sir Hans Sloane.



Fig. 2. *The Natural History Museum, London.*

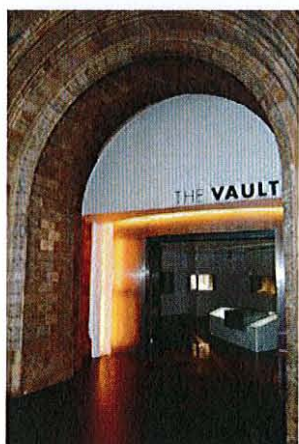


Fig. 3. *The entrance to "The Vault" at the NHM in London.*

HISTORIC IMPORTANCE: *Columbite from the New World*

Sir Hans Sloane seemed only vaguely interested in minerals and gave the most collecting attention to mineral substances that had been carved into objects, or those that were thought to have some medicinal property. For example, many of Sloane's faceted gems and carved handles are still clearly identifiable in the collections (Fig. 4) and the earliest dated 'mineral specimen' (*as modern usage would dictate*) is an unspectacular bismuth specimen dated '1682' preserved as a constituent of a medicinal cabinet.

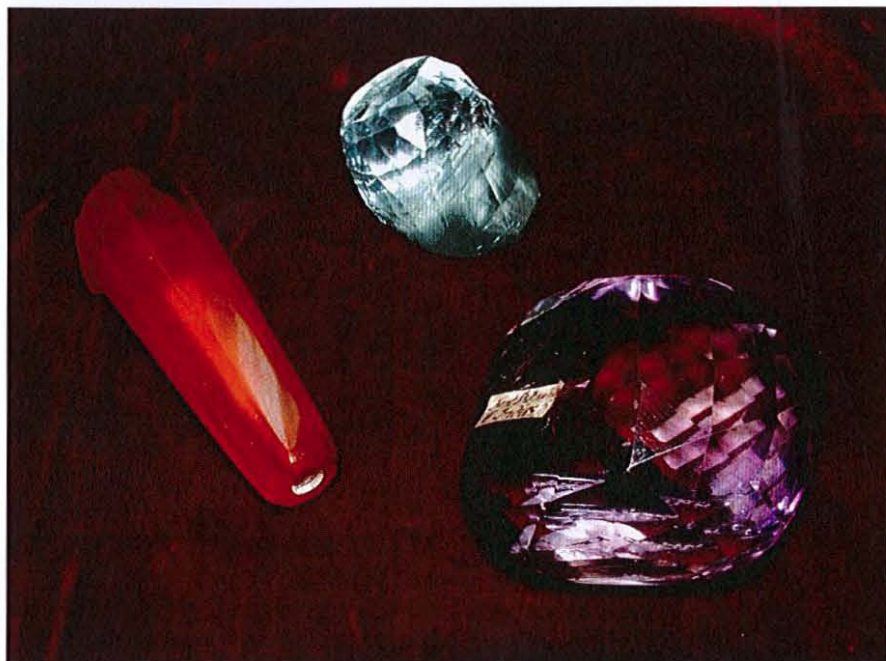


Fig. 4. Various worked mineral specimens within the collections at the NHM that can be traced back to Sir Hans Sloane. From left to right: a carnelian handle, a cut and faceted aquamarine crystal, and a faceted amethyst pebble. The field of view is about 15cm.

However, in amongst the few other recognisable Sloane objects that we would consider a 'mineral specimen' is a small, irregular, black rock (Fig. 5) that was given to Sir Hans Sloane by John Winthrop in 1734. Aside from the piece of bismuth this black lump may be the oldest 'mineral specimen' in the whole mineral collection, yet this is only of minor importance when its full significance is explained.

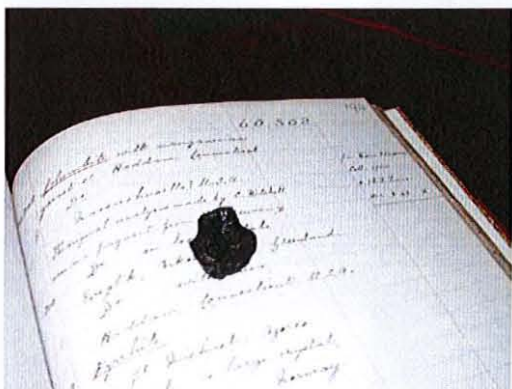


Fig. 5. The small black lump of what eventually became columbite, resting in this photo upon the register that details its entry into the collections at the NHM. The specimen is about 20 mm in size.

John Winthrop was one of the early politicians in the “new world”, (now the modern day United States of America) eventually becoming the first governor of Connecticut. The specimen was probably passed to Sloane by Winthrop due to its unusual property of being surprisingly heavy for its small size, and no doubt that as an object from the “new world” it also had some value as a cultural curiosity.

Unfortunately this curiosity was seemingly not enough for the specimen to gain any acclaim. Through lack of reference, it can be assumed that it languished relatively unnoticed in Sloane's Collection and then in that of the newly founded British Museum for nearly 70 years until it was studied by physical chemist Charles Hatchett in 1801.

Hatchett sampled the specimen and showed through analysis that it contained a previously unrecognised element and as such it had to be a new mineral. As the specimen originated from the new world, he decided to call the mineral columbite and the element columbium, both after Columbia, a name that was in use for the 'new world' at this time which stemmed from the explorer Christopher Columbus.

This specimen now resides in the Type Collection at the NHM and has the distinction of being the only specimen in the collection that is certainly the type material for both a mineral species and a chemical element. Unfortunately the nuances of nomenclature have now lead to the removal of both of Hatchett's original terms. The element columbium 'Cb' is now officially replaced with niobium 'Nb' and, columbite is more strictly a mineral “group name” with Hatchett's early analysis corresponding to what we would now call ferrocolumbite. It is a shame that the mineral and element names no longer reflect each other and perhaps were it not for this specimen being held in a museum the whole story and the links to this tiny object might have been lost.

Koh-i-noor Casts and Models

Treasures of the mineral collection are not always mineral specimens. The Koh-i-noor is arguably one of the worlds most well known diamonds and it currently resides in the crown jewels of the Royal Family in the United Kingdom, having settled after a particularly turbulent history dating back many centuries. To cover the early history of the Koh-i-noor is beyond the scope of this article but many books have been written about it and the reader is directed to one of those should it be of interest (*for a summary history, see Balfour 2009*)



Fig. 6. Plaster cast and mould of the original Koh-i-noor, discovered ‘unregistered’ in an NHM store room within the last 10 years.

The diamond came to the United Kingdom under the reign of Queen Victoria and was exhibited in the Great Exhibition of 1851. However, many who viewed the stone were disappointed by its lack of brilliance, a consequence of the gemstone being an old mogul cut that had been fashioned from the rough stone in order to make the most of its weight rather than the more modern brilliant cuts that enhanced diamonds optical properties. This lack of enthusiasm was shared by Queen Victoria and so her husband Prince Albert arranged to have the stone re-cut to a more modern form.

The gemstone was re-cut from its 186 Carat Mogul form to a shallow old brilliant of just over 105 carats, equating to a staggering 42% loss in weight. The original Mogul form has often been misrepresented in the literature and only until a recent discovery in NHM store rooms of the original plaster moulds that were cast from the Koh-i-noor, has it been made possible to ascertain the exact shape of its Mogul cut form.

Using the moulds and scanning technology, a 3D computer model of the Mogul form was generated in turn, through using this model gemmologist and renowned gem cutter, Scott Sucher, was able to create an exact model/copy made from cubic zirconia of the original form of the diamond which was donated to the museum. This model, along with the original moulds and a cubic zirconia model of what the Koh-i-noor now looks like are all on display in "The Vault" (Fig. 7) in order to visually put an end to the historical confusion that has existed.



Fig. 7. Cubic zirconia models of the Koh-i-noor as it is now (top) and as it was (bottom), reconstructed from the plaster moulds found in the NHM.

The Cursed Amethyst

The Koh-i-noor is regarded by some as being a cursed object. One of the highlights of the NHM mineral collections, "The Cursed Amethyst" is, as its nickname suggests, also considered to be cursed. This specimen, also on display in "The Vault" is a highlight of the collection only because of its bizarre story. Visually this amethyst is an unremarkable cut stone mounted within a bizarre silver setting (Fig. 8) which until recently had been kept off display since its donation to the NHM in 1944.



Fig. 8. *"The Cursed Amethyst" on display in "The Vault" at the Natural History Museum in London.*

It is recorded that the amethyst's tale begins in India, where it is said to originate. The specimen was reportedly looted and returned to the UK by an officer in the British army. Unfortunately for the officer, he suffered ill health and financial difficulties and eventually he gave the stone to his son who then suffered similar woes. The connection between the men and their troubles appeared to be the gemstone, and it consequently gained a reputation for being cursed. There is a particularly gruesome record amongst a number of minor tangential stories relating to the stone, that at one stage it was given to a friend of the officer's son, whom after receiving it committed suicide and instructed that the amethyst be returned the son.

Fearing the supposed curse upon the amethyst, the son contacted a well known polymath called Edward Heron-Allen, who was interested in both natural history and the occult and thus in a good position to study the stone. Heron-Allen decided that the stone's curse needed to be mitigated and that this could be done by setting it within a silver band adorned with the 12 signs of the zodiac and placing this band between a 'magical' symbol and two amethyst scarabs, supposedly of Egyptian origin, which explains its unusual appearance today.

Whilst in Heron-Allen's possession the curse appeared to have little effect, but after some years he feared that the stone may influence his growing young family. Consequently, he decided that he rid himself of the stone by throwing it into the Regents canal in London. Incredibly, not long afterwards, a dredger scouring the canal came across the amethyst and its distinctive silver setting and passed in to an antiques dealer who recognised it as belonging to Heron-Allen and before long, returning through some seemingly impossible route, the specimen was back with its owner.

Having failed to throw the amethyst away, Heron-Allen decided that he would instead record the history of the stone, package it up within 7 consecutively smaller boxes, and place it in his bank vault, with instructions for it to be opened after his death and that anyone who should open it, should read his recorded history of the stone so that it may act as a warning.

The stone, along with Heron-Allen's note ended up at the NHM and the stories above are some of those contained with the small document. The note is an interesting read starting with a line that reads "this stone is trebly accursed and is stained with the blood, and dishonour of everyone who has ever owned it"

In the last 5 years, it has become clear that the story behind the stone is more likely to be a clever and elaborate marketing ploy. Edward Heron-Allen wrote a short fictional story under a pseudonym about a stone that he called "The Delhi Purple Sapphire". This stone had a remarkably similar story to the one outlined in the note and it seems that Heron-Allen was trying to bring some of his own fiction to life with the eventual donation of the stone alongside its reported history to the NHM.

HIGHLIGHTS FROM THE UK, *Bournonite* - "Cog-Wheel Ore"

The mineral collection is not only the home of specimens that hold significant scientific or historical interest, but it is also the home to many of the finest examples of aesthetic British minerals sourced from the heyday of mining in the rich mineral centres of Cornwall and northern England. Some of the largest, most celebrated and spectacular examples of classic British minerals are the bournonite specimens held by the NHM, one of which is currently on display in "The Vault" (Fig. 9).



Fig. 9. *Bournonite* from Herodsfoot Mine, Cornwall – currently on display in "The Vault". The specimen is about 22 cm in length.

Discovered around 1789, and for a while later also called endellionite, the first few specimens of bournonite species were found at Wheal Boys in the parish of St. Endellion in Cornwall. These specimens consisted of bournonite in cruciform crystals quite unlike those later finds that Cornwall is now famous for. These cruciform crystals can be seen in what is probably the first figured depiction of a bournonite specimen worldwide in Philip Rashleigh's 1797 work "*Specimens of British Minerals selected from the Cabinet of Philip Rashleigh*," (Fig. 10).



Fig. 10. Copy of plate 19 in Philip Rashleigh's "*Specimens of British Minerals...*" (1797) showing the first figured depictions the mineral bournonite. Both specimens at one time constituted part of his own collection but are now both preserved in the collections mineral collections at the NHM, London.

This figured specimen is now an important historic part of the mineral collection at the NHM, representing not only one of the most famous British minerals, but one that is featured in one of the earliest books containing hand coloured mineral drawings (Fig.11).

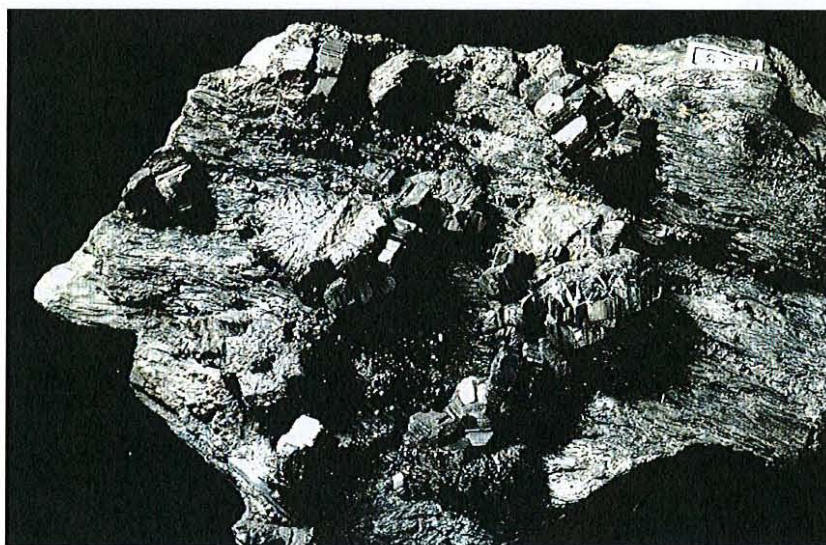


Fig. 11. A recent photo of bournonite specimen No. 2 in Fig.10 from Wheal Boys, Cornwall now in the Russell Collection at the NHM. (compare cruciform crystal in lower left).

The much larger and notoriously collectable "Cog-wheel" bournonites (Fig. 9) began to appear on the mineral market a little later (1850-1875) from the famous Herodsfoot mine in Liskeard, Cornwall. The NHM mineral collection contains several of these pieces. Two of the most spectacular are on display in the museum and recently one made an appearance the 2011 Munich mineral show as a centrepiece within the "European Classics" display.

Other Cornish Mineral Species

As well as the world's best bournonites, the NHM mineral collection also contains some very significant, aesthetic examples of other important Cornish mineral species, the likes of which have been found only very sparingly across the rest of the globe. Significant highlights include liroconite (Fig. 12), stephanite (Fig.13) and clinoclase (Fig. 14).

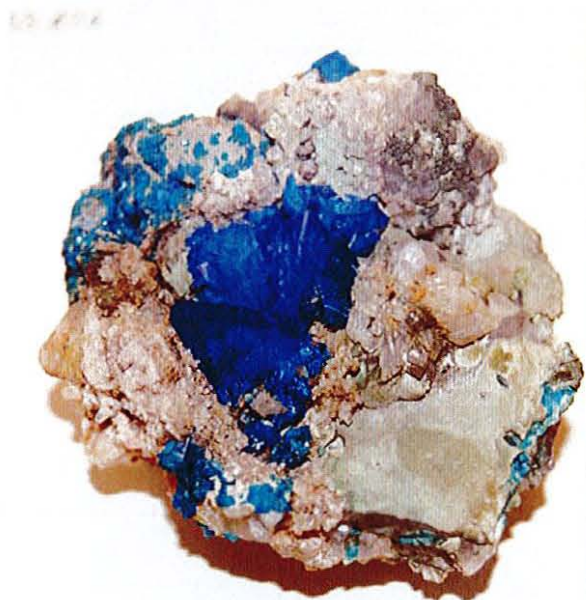


Fig. 12. One of the best liroconite specimens from Wheal Gorland, Cornwall part of the mineral collection at the NHM. The two large crystals are both just over 1 cm in width.



Fig. 13. One of the very few recorded stephanite specimens from Wheal Newton, Cornwall, part of the Mineral collections at the NHM. This specimen is approximately 11 cm high.

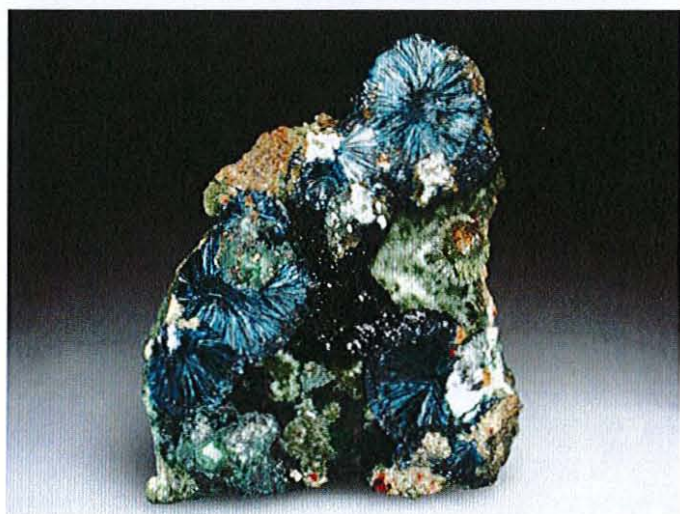


Fig. 14. One of the best clinoclase specimens from Wheal Gorland, part of the mineral collection at the NHM. This specimen is approximately 10 cm high.

The Box and Lady's Slippers

"The Vault" contains a second significant specimen from the south west of England which has been nicknamed "The Box" by curators at the NHM (Fig. 15) This specimen displays a crust of rounded brown siderite crystals, forming a hollow cast or epimorph of a cube 9cm across which is naturally open on one side, giving rise to the specimen's affectionate nickname. The precursor mineral was almost certainly fluorite, indicated by the mosaic like cubic indentations on the inner surface of the epimorph. Yet, no trace of the fluorite remains and the cubic epimorph is instead the home for an aesthetic aggregate of milky quartz and chalcopyrite crystals.



Fig. 15. "The Box" – A siderite epimorph after Fluorite from the Virtuous Lady mine, Devon. Currently on display in "The Vault". The cube edges are about 9 cm in length.

The specimen is not only beautiful, but it also shows with striking clarity a geochemical story, and is one of only a few examples of its kind. This specimen came to the museum in 1847 from the Virtuous Lady Mine in Devon a mine also famous for another distinctive group of specimens known as "Lady's Slippers" (Fig. 16).



Fig. 16. A very large example measuring around 30 cm in length of a siderite and pyrite epimorph after an unknown precursor mineral from Virtuous Lady Mine, Devon. Specimens such as this are known colloquially as a "Lady's Slipper".

These specimens are also epimorphs of pyrite or siderite after a much debated yet still unknown precursor mineral. These pieces form in an elegant sort of Gothic arch shape and were found in some considerable quantity around 1832-1833. Some of the finest examples known also reside in the collection at the NHM. However they pose a conservation issue as they tend to be impregnated with micro-crystalline pyrite which is prone to decomposition, a dangerous combination that could potentially destroy these unusual and incompletely understood specimens.

The Russell Collection

Many of the significant British specimens, with aesthetic, scientific or historic value were added to the collections at the NHM in 1964, with the bequest of Sir Arthur Russell (Fig. 17). The Russell Collection contains some 13,000 mineral specimens many of which were obtained at great expense and time by Russell from other collectors, collections, mines and miners. It is the most significant collection of British minerals ever assembled by a private collector and is kept as a separate collection within the NHM. The collection contains many historically important figured specimens that were illustrated in the famous early works of Sowerby (1805) and Rashleigh (1797) (Fig.10) it contains a few very special, unique or aesthetic specimens such as the blue Holmbush Fluorite (Fig.18) and the cruciform Bournonite (Fig.11)

Spectacular, individual examples aside, it should be remembered that the greatest value of the Russell collection is when it is viewed, appreciated and studied in its entirety.



Fig. 17. Sir Arthur Russell.



Fig. 18. A potentially unique specimen suite from the Russell collection, consisting of a large cleavage fragment and a broken cube of a very unusual deep sea-green/blue coloured fluorite from Holmbush Mine, Cornwall. The larger specimen is 9 cm in width.

HIGHLIGHTS FROM OVERSEAS, *The Latrobe Nugget*

Not all the highlights of the NHM mineral collection are from within the British Isles. During the periods of empire, a large number of significant mineral specimens were donated to the NHM from overseas territories. To cover all of them is far beyond the scope of this article, so only a very special few are outlined here. One such specimen is the Latrobe gold nugget (Fig. 19), found at McIvor mine in Victoria in 1853, Australia and donated to the museum shortly afterwards.

The nugget is named in honour of Charles Joseph Latrobe, the Governor of the State of Victoria, Australia when the Nugget was found. It is a reasonably significant size, weighing 717 grams, but its importance is that it is one of only a handful of significant nuggets in existence that preserve the crystalline nature of gold; cubes, octahedrons and stepped growth patterns can be easily identified upon the specimen, which is almost entirely devoid of matrix.

It has been figured in a great many books and forms one of the signature pieces of "The Vault" gallery.



Fig. 19. *The Latrobe Nugget, showing well formed gold crystals from the collections at the NHM, this specimen is around 10 cm in height and weighs 717 grams.*

The untarnished proustite

One treasure that is not on display in "The Vault" is a suite of proustite specimens from Chanarcillo in Chile, although one of the samples (Fig. 20) in this suite may be the worlds finest example of the species, the specimen cannot be displayed due to the light sensitive nature of its silver arsenic sulphide composition. This specimen (BM 50811) measures about 15cm x 6cm x 8cm and is composed entirely of lustrous, inter-grown, blocky terminated crystals, the largest of which is several cm in extent. BM 50811 is particularly unusual as it was placed in darkness from the moment it was removed from the mine in the 1870's and has therefore retained most of its original 'blood' red colouration and has not significantly tarnished to the sub-metallic lustre that is so common for many specimens of this species.

The specimen entered the mineral collecting world at auction where it sold for £200 in 1876 and was bought by the generous collector Henry Ludlam, who after purchasing it offered it as a donation to the museum so that it may be preserved in its incredible condition for as long as possible. (*Various online finance engines indicate that £200 in 1876 is equivalent to a value somewhere between £15,000 and £235,000 in 2010, regardless of current value, the acquisition of this specimen was clearly a very significant donation at this time*)

Alongside the main specimen are a number of smaller pieces and a very large single crystal, which has unfortunately undergone a more extensive amount of tarnishing, but is still of significance as one of the largest if not the largest crystal of proustite known.



Fig. 20. BM 50811 of Proustite from Chanarcillo, Chile donated to the museum in 1877 by Henry Ludlam. The specimen is 12 cm in length and has a superb lustre, the largest crystals in this mass, visible to the right of this photo measure 5 cm x 3 cm X 2 cm.

Siberian Topaz Suite

A further suite forever confined to the drawers of the mineral collection for fear of damage is a set of Siberian topaz crystals from Urulga River obtained from Nikolay Koksharov in 1865. These are preserved in the dark as it has been reported that such specimens will lose their subtle brown or "Sherry" colouration on exposure to light.

In order to help preserve the colour, sometime after acquisition the curators at the NHM created from velvet lined card, perfectly fitted 'jackets' for each of the individual pieces, complete with full crystallographic notation, such attention to conservation care has no doubt significantly improved the longevity of these samples and is a fantastic snapshot of curation in a bygone era.

The suite contains 5 crystals in total, the largest which measures 12cm x 8cm x 8cm, the entire suite contains nothing but aesthetic, gem quality crystals with perfect terminations and mirror-like crystal faces. (Fig. 21)

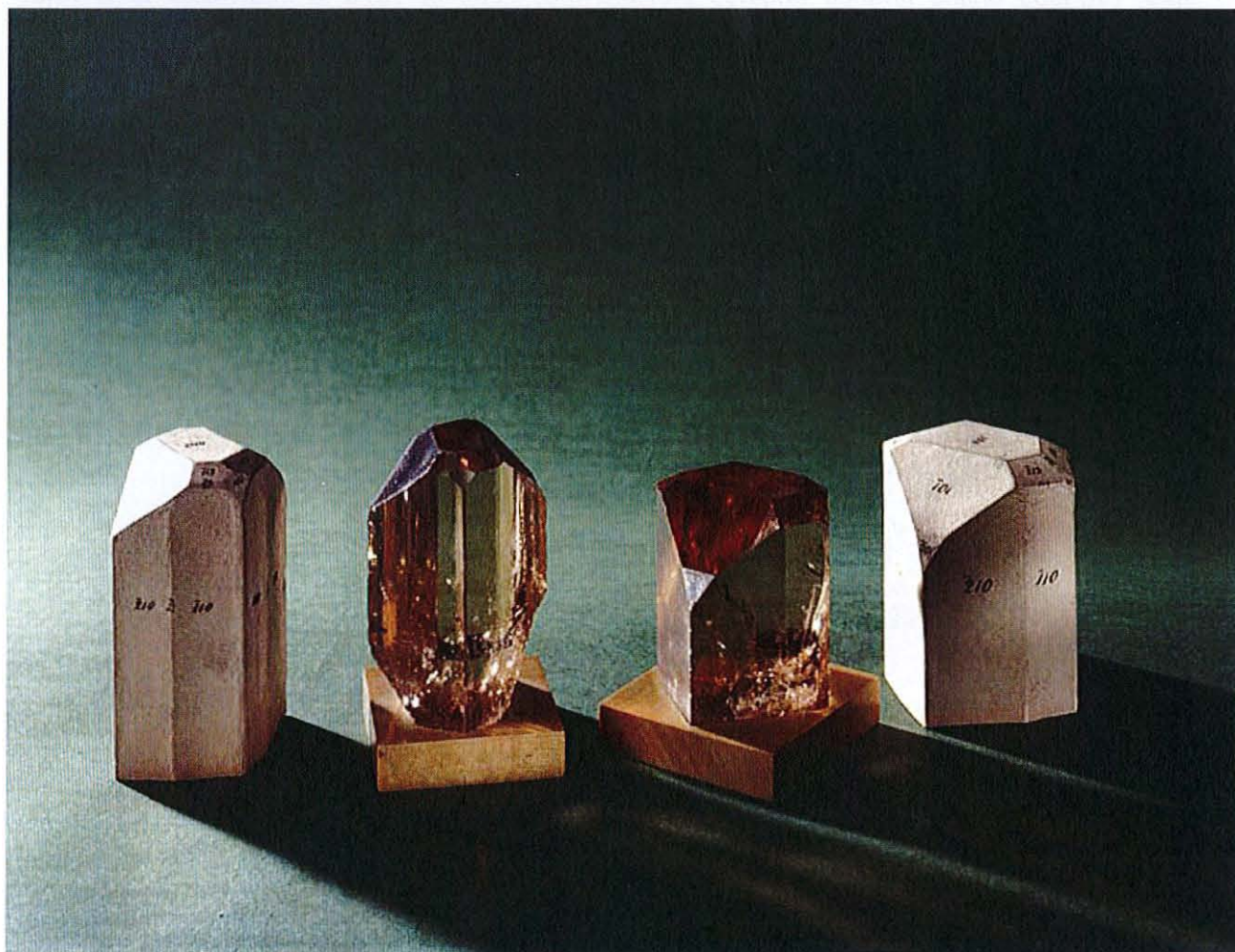


Fig. 21. An old photo showing two of the Urulga River topaz specimens obtained in 1865 in their wooden mounts and alongside the velvet lined fitted jackets. The larger of these two specimens is 8 cm in height.

SCIENTIFIC HIGHLIGHTS: *Painite*

Painite was until recently a very rare mineral, with each known piece being given a reference number by the researchers who were investigating its occurrence. From the first donation in 1954, until the early 2000's the NHM was the worlds most significant repository of painite crystals, being the home of the type specimen, "*Painite No.1*" and later the second known piece, "*Painite No.2*"

(Fig. 22). Although not much to look at, with both crystals a very dark brownish black colour, each measuring only around a cm in length, painite was surprisingly, for a long time considered to be the world's rarest gemstone and one of the worlds rarest minerals that wasn't confined to microscopic grains. Because of its rarity, painite gained a cult status amongst collectors, dealers and curators and these two crystals inspired a US mineral dealer to spend a vast amount of his time attempting to locate the original *insitu* geological source in Burma, which was finally realised with the discovery of Wetloo mine in 2003.

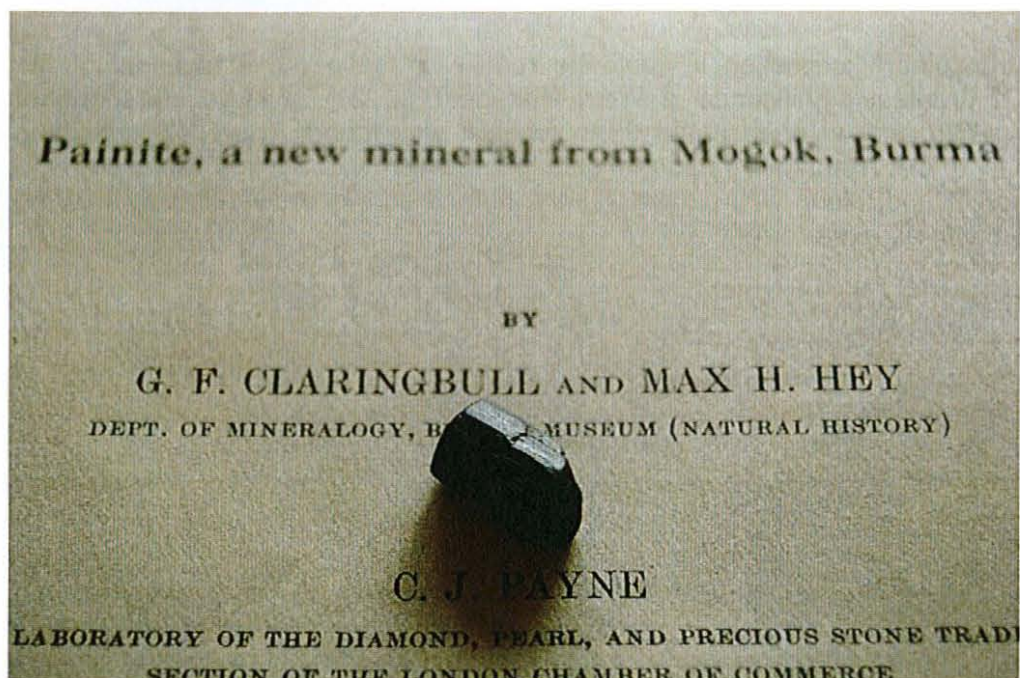


Fig. 22. A close up of "Painite No.2", resting upon a reprint of the paper that was published by researchers at the NHM naming the species in 1957.

The Type Collection

The painite and columbite specimens featured earlier are both held within the 'Type Mineral Collection' at the NHM (Fig. 23). This small collection separated from the main collection and curated individually contains between 500 and 600 specimens, all of which have been linked at one point to the original description and analysis that lead to a new mineral and species name.



Fig. 23. The 'Type Mineral Collection' at the NHM.

Therefore these samples represent the sacrosanct reference materials that define what exactly our science perceives a certain mineral species to be. The types in the NHM collection span over 220 years of mineralogical research, the earliest dating from the late 18th Century and the most recent dating to 2012, the collection also contains a number of approved mineral species that have not yet been published. All 'Types' are without doubt the most important scientific specimens that the museum holds and considering there are between 4500-5000 mineral species known, the NHM is the custodian of reference material for over 10% of all known species in the mineral kingdom.

Meteorite highlights

Although not part of the mineral collection it would be remiss to leave out a highlight of the Meteorite collection. Of greatest significance is Wold Cottage (Fig. 24), a large L6 chondrite meteorite which fell in 1795 and weighed about 25Kg when it was found. The NHM collection includes the vast majority of this historically important specimen, which was the first witnessed and collected 'fall' within the UK and, along with several others, helped convince scientists at the time that such objects really could be extra-terrestrial.

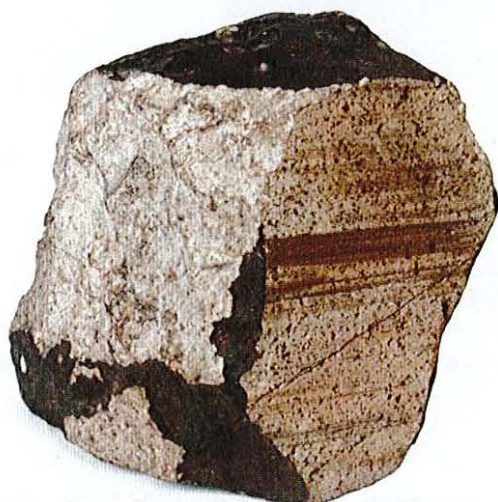


Fig. 24. Wold Cottage meteorite, showing fusion crust, broken surfaces and a rough sawn face where material was removed many years ago. The specimen is about 25 cm in height.

Final Comments

Treasures and highlights can take many years to become the revered objects that they are today, however due to the NHM's continued work sourcing new acquisitions, very occasionally an object that will almost certainly become a new treasure is added to the collections. The most recent acquisition that could fit this criterion is a Martian meteorite specimen about 1.1kg in weight called Tissint (Fig. 25) that was obtained through a combination of purchase, exchange and donation in February 2012. This very important addition to the collection is a witnessed martian fall from Morocco and is now the largest piece of Mars within the NHM collections, it is currently on display in "the Vault" gallery and it holds a vast amount of research potential.

The acquisition of Tissint indicates that treasures are still being found and modern technological advances or serendipity may bring us yet more important geological samples in the future. It's a reminder that museums should be funded in ways that allow the acquisition of modern day treasures and, that not every 'highlight' of a collection has to be a "classic".



Fig. 25. Martian meteorite, Tissint on display in a sealed environment in "The Vault" at the NHM in London. The specimen measures a little over 10 cm in width.

Selected References & Further Resources

BALFOUR, I. (2009): *Famous Diamonds*. Christie, Manson & Woods, London. 164-184.

CAMPBELL-SMITH, W. (1979): A history of the first hundred years of the mineral collection in the British Museum. *Bulletin of the British Museum (Natural History), Historical Series* **3 (8)**, 237-259.

EMBREY, P.G. & SYMES, R.F. (1987): *Minerals of Cornwall and Devon*. B.M.(N.H.) Publishing, London

SUCHER, S., CARRIERE, D. (2008): "The Use Of Laser And X-Ray Scanning To Create A Model Of The Historic Koh-I-Noor Diamond". *Gem & Gemology*, **44**, (2), 124–141.

THACKRAY, J. & PRESS, B. (2001): *Natural History Museum: Nature's Treasurehouse*. Natural History Museum Publishing, London.

Weblink - BBC NEWS website (2012): "Rare Martian meteorite given to science"
<http://www.bbc.co.uk/news/science-environment-16943200>

Weblink – NHM website (2012): "The Vault"
<http://www.nhm.ac.uk/visit-us/galleries/green-zone/vault/index.html>

Weblink – Palagems website (2012): "Painite comes to Pala"
<http://www.palagems.com/painite.htm>

Weblink – History Television, Museum Secrets Series (2012): "Cursed Amethyst"
<http://museumsecrets.tv/dossier.php?o=61>

FIGURES – Note all Images are Copyright of the NHM.

Reference to this article:

Rumsey, M.S. (2012): Highlights and history of the mineral collections at the NHM in London. Norwegian Mining Museum, Publication No.49, 5-22.