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Gemstones First Discovered as Cut Stones: Taaffeite vs. Tourmaline

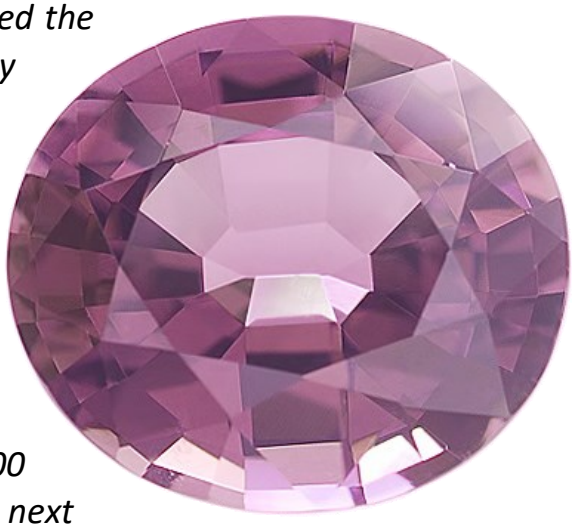
By James Evans, FGA

That the rare gemstone taaffeite was first discovered as a cut stone is well-known among gemmologists. But was taaffeite the first gem to be discovered in this state, or does tourmaline have a better claim to the honour?

Taaffeite

It was in 1945 that the Irish nobleman Richard Taaffe first noticed the peculiar gem that would come to bear his name. As he later recalled:

> *On one of my rounds in search of gems I came to Mr. Robert Dobbie, watchmaker and working jeweller in Fleet Street, Dublin; he allowed me in his genial way to go through all his boxes in which he kept stones, to pick out any that were real [...] and to make him an offer for them. He only needed the pastes [i.e. glass] for jobbing. That was one day in October 1945. [...] The pastes were mostly new, but the stones were without exception broken out of jewellery, badly rubbed or chipped in many cases. They had been in the workshop since the times of Mr. Robert Dobbie's father, some for twenty years. [...]*
>
> *After several hours I showed Mr. Dobbie what I had selected so far; maybe [...] 50 or 100 stones. I paid and arranged to continue the next day, and took the 'bag' home. [...] The total purchase price was £14 [around £600 today] [...].*



A faceted taaffeite.[1]

> *Now, at home, I washed the stones, which were very dirty, and started sorting them and testing each one of them, because I am always afraid of a wrong identification if I go only by appearance. First I sorted according to colour. The taaffeite was put into the little box containing violet and lilac stones; then viewed under my [...] microscope, [...] and viewing it under different angles and from several sides, I look for double refraction and evidence of the stone's identity [...]. One of the stones in which I can sometimes not detect double refraction is topaz; I do not understand why.*

I have to twist and twist and look into every facet until I can see it. But not so with the taaffeite. In a certain direction every speck of dust on the back and every scratch appeared double like on a badly wobbled snapshot.

Next step: specific gravity. […] My only balance was a pocket diamond balance which I had to hold by the tassel. As B. W. Anderson taught me in his book' Gem testing', I determined the S.G. by hydrostatic weighing in water, holding the tassel and repeating the observation ten times. The average of ten results was 3.62.

Facets were scarcely visible in methylene iodide, so I gathered that the refractive index was near spinel. […] But the double refraction! I checked it with crossed nicols [i.e. a polariscope] and got normal extinction at 90 degrees. I became puzzled. I could see no bands in the spectrum. […] I panicked, sent the stone to B. W. Anderson at the Laboratory of the London Chamber of Commerce, and begged for help. I wrote on November 1 1945: 'This time a new riddle: what is this mauve stone? It seems to me to answer all characteristics of spinel, yet it shows double refraction: doubling of facets visible under the Greenough [microscope], extinction when polarized, though with queer colour effects. Could anomalous double refraction be so strong? R.I. too high for topaz, S.G. too low for corundum. What is it?'

A rough taaffeite crystal.[2]

B. W. Anderson replied on November 5: 'You have sent a most interesting stone in that mauve spinel (I call it that on the basis of its absorption spectrum: my colleague is so horrified at its anomalous optics that he doubts whether it is spinel). The indices are 1.717 and 1.721, clear double refraction, giving a clear uniaxial interference figure through the table facet. The stone is so remarkable that I should like your permission to have an X-ray analysis made, if possible without harming the stone. I should also like to write it up for the Gemmologist, giving full credit to you for discovering it. Would you agree?'
(Anderson; Payne; Claringbull, 1951, pp.765-766)

The X-ray analysis Anderson mentioned would soon confirm what was already known from the gemstone's optical properties; that Taaffe had discovered a new mineral species.[3] Yet the new gemstone wasn't reported until 1951, by which point Anderson's colleague James Payne had uncovered a second cut specimen.

Tourmaline

In contrast to taaffeite, tourmaline is not a rare gemstone. Nevertheless, it evaded scientific identification for centuries, despite taking centre-stage in the 14th Century Crown of Saint Wenceslas (Hyršl & Neumanova, 1999, pp. 29-36).

Tourmaline's eventual identification in the early 18th Century followed from an unusual property of the gem; that, when heated, it produced an electric charge. This property (known as pyroelectricity) was noted in a book of curiosities from 1707, as follows:

> *The ingenious Dr. Daumius, chief physician to the Polish and Saxon troops on the Rhine, told me that, in the year 1703, the Dutch first brought from Ceylon in the East Indies a precious stone called Tourmaline, Turmale, or Trip, which had the property of not only attracting the ashes from the warm or burning coals, as the magnet does iron, but also repelling them again [due to the stone's electrical polarity changing as it cools]. […] For this reason, the Dutch called it 'Aschentrecker' ['Ash-puller']. The colour of it was a pomegranate-red heightened by the colour of fire.*
> (Schmidt, 1707, pp.269-270)

The discovery of tourmaline's pyroelectric nature was reportedly made by the children of Dutch merchants whilst playing with their parents' gems. More likely it was the parents who made the discovery whilst attempting a heat treatment of the stones (Zara, 1973, p.33). In any case, when we consider that the Dutch only exported cut stones from Ceylon (Müller, 1780, p.183), the case for Tourmaline being discovered as a cut stone becomes clear.

A faceted tourmaline.[4]

However, the very first recorded identification of tourmaline was achieved by neither a Dutch child nor their parents, but by Diocles of Carystus in the 4th Century BCE. The evidence for this is provided by Diocles' compatriot Theophrastus, as follows:

> *[…] 'smaragdos' [(a green gemstone)] is rare, as we have mentioned, for it seems to be formed from 'iaspis' [(a colourless gemstone)]. It is said that a stone was once found in Cyprus half of which was 'smaragdos' and half 'iaspis', as if it had not yet been entirely changed from the watery state.[5] […]*

Two water-worn tourmalines. According to Theophrastus, the female lynx produces a stone that is more transparent and more yellow than the male's.

It is remarkable in its powers, and so is the 'lyngourion' [(the 'lynx-urine stone')]; for seals are cut from this too, and it is very hard, like real stone. It has the power of attraction, just as amber has, and some say that it not only attracts straws and bits of wood, but also copper and iron, if the pieces are thin, as Diokles [sic.] used to explain. It is cold and very transparent, and it is better when it comes from wild animals rather than tame ones and from males rather than females; for there is a difference in their food, in the exercise they take or fail to take, and in general in the nature of their bodies, so that one is drier and the other more moist. Those who are experienced find the stone by digging it up; for when the animal makes water, it conceals this by heaping earth on top. (Theophrastus, 4C BCE, 27-28, printed in Caley & Richards, 1956, p.51).

The description of lyngourion as a cold, hard stone with the power of attraction and a yellowish colour implies it is the stone known today as tourmaline.[6] This was first noted by William Watson in 1759, but generally dismissed due to *'the absence of tourmaline among surviving examples of ancient gems'* (Caley & Richards, 1956, p.110). Watson's theory wasn't confirmed until 2019, when Gloria Staebler drew attention to a tourmaline intaglio bearing the image of 'Alexander the Great' and dating from the 4th Century BCE (pictured).

The supposed 'organic' origin of lyngourion suggests that neither Theophrastus nor Diocles ever saw a rough crystal. But whether its power of attraction was first discovered in a water-worn pebble (dug up in the territory of a lynx) or a cut stone (such as a seal), we will likely never know.

A yellow-red tourmaline intaglio depicting the head of Alexander the Great, 4C BCE.[7]

So which gemstone was the first to be discovered as a cut stone? Given the latest evidence of tourmaline's identification by Diocles of Carystus (in the 4th century BCE), this honour must surely go to Richard Taaffe and his discovery of Taaffeite in 1945.

Notes

[1] Image by Multicolour.com, used under Creative Commons licence CC BY 3.0.

[2] Image by Rob Lavinsky, used under Creative Commons licence CC BY-SA 3.0. Edited by the author.

[3] Due to the stone's shape, the authors suggested it had been cut in Ceylon (Anderson; Payne; Claringbull, 1951, p.767). It is very likely that it originated in the same country.

[4] Image by Galka / Shutterstock.com. Edited by the author.

[5] The 'smaragdus' described by Theophrastus may well have been a tourmaline, for parti-coloured tourmalines are not uncommon. Nevertheless, it is the yellowish 'lyngourion' that Theophrastus then describes as having the power of attraction.

[6] Although tourmaline is found in many colours, yellowish stones are among the most common. Thus, having sought the gemstone in Ceylon, John Davy reported in 1818 that:

> *[…] common shorl is not indeed uncommon […], but tourmaline is rare: the honey-yellow variety is the only one I have seen'* (Davy, 1818, p.319).

[7] Image of a tourmaline intaglio depicting the head of Alexander the Great (wearing the horns of Zeus-Ammon). © Ashmolean Museum, University of Oxford / Heritage Images.

Image below: from Joachim of Fiore's *Bestiary* (edited by the author).

A lynx in the process of creating a lyngourion (tourmaline).

Bibliography

Anderson, Basil; Payne, Cesil; Claringbull, Frank (1951). Taaffeite, a new beryllium mineral, found as a cut gemstone. *Mineralogical Magazine*, 29(215), pp.765-772.

Caley, Earle R.; Richards, John F. C. (1956). *Theophrastus on stones*. Columbus: The Ohio State University.

Davy, John (1821). On the geology and minerology of Ceylon. *Transactions of the Geological Society*, 5(1), pp.311-327.

Joachim of Fiore (13C). *Bestiary*. Part of the Bodleian Library collection. Shelfmark: Bodleian Library MS. Douce 88, Folio: 008r.

Hyršl, Jaroslav & Neumanova, Petra (1999). Eine neue gemmologische Untersuchung der Sankt Wenzelskrone in Prag (A new gemological study of the Saint Wenceslas Crown in Prague). *Gemmologie: Zeitschrift der Deutschen Gemmologischen Gesellschaft (Gemmology: Journal of the German Gemmological Society)*, 48(1), pp.29-36.

Müller, Franz-Joseph (1780). Sur la Tourmaline du Tirol (On the Tourmaline of Tirol). *Observations sur la Physique, sur L'Histoire Naturelle et sur les Arts (Observations on physics, natural history and the arts)*, 15, pp.182-198.

Schmidt, Johann Georg (1707). *Curiöse Speculationes bey Schlaf-losen Nächten (Curious speculations during sleepless nights).* Leipzig: Conrad Stöffeln.

Staebler, Gloria (2019). Rubellite, a historic gem. Published in *Rubellite (*2019). Arvada: Lithographie, Ltd.

Theophrastus (4C BCE). *On stones*.

Watson, William (1759). Some observations relating to the Lyncurium of the Ancients. *Philosophical transactions of the Royal Society of London*, 51, pp.394-398.

Zara, Louis (1973). The Tourmaline. *Mineral Digest*, 5, pp.33-46.