THE ETYMOLOGY OF THE MINERAL NAME 'APATITE': A CLARIFICATION

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Abstract

The mineral name 'apatite' derives from a Greek word referring to deception but the exact etymology has become a source of significant confusion: authoritative mineralogy books, mineral websites and general reference works are mutually inconsistent. The original references were examined and present-day variations assessed for accuracy. German mineralogist Abraham Gottlob Werner published the original etymology in 1788 for the mineral he had privately already named. Werner's original term was the German *Apatit*, which he derived from the Greek verb απατάω (accentuated thus; but following today's printing conventions would be ἀπατάω), giving only the Latin translation 'decipio'. The verb ἀπατάω transliterates to *apatáō* and translates into English as 'to deceive' (someone) or 'to be deceptive' (used absolutely). However, the word *Apatit* itself had actually been published two years before Werner, in 1786, by German mineralogist Carl Abraham Gerhard, who nonetheless credited Werner as its originator.

Introduction

Apatite (Fig. 1) is a mineral that every geologist, amateur and professional, knows. Not only does it feature in Mohs' scale of hardness, as number 5, but it is probably the most widely distributed mineral in existence, occurring in almost every type of igneous, metamorphic and sedimentary rock, both terrestrial and extraterrestrial.

It is widely known that the name 'apatite' derives from a Greek word that has a meaning connected to being deceptive. Before it was identified as a separate mineral species—now having the rank of mineral series—it was forever being confused with other minerals, or being misidentified as a new mineral. It had, thus, deceived many people for a long time before it was unmasked as being all the one mineral but in many different contexts and with many different colours. It was the eighteenth-century German geologist and mineralogist Abraham Gottlob Werner (1749–1817) who unmasked the deception: he named the mineral and published his reason for choosing the name.

The etymological situation would appear, then, to be quite simple. But this is not the case. Anyone wanting the origin of the name 'apatite' and using authoritative mineralogical or etymological secondary sources from the last 200 years is faced with a multitude of explanations, all similar, but hardly any of which agree exactly with each other. There are variations and permutations across all the key factors: in the chosen Greek word, in the chosen transliteration, in the chosen translation, in the year that the name was first published, and even who was responsible for the name.

This paper attempts to clarify the name's origin because the level of confusion and/or error in so many authoritative sources is significant. These sources include noted textbooks, such as those written by Dana (father and son James and Edward, respectively) in the nineteenth century; or by Deer, Howie and Zussman in the twentieth century; or

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Fig. 1—Fluorapatite. Cerro Mercado, Durango, Mexico. 6.4cm high. Peter Megaw collection. Photo: Jeff Scovil.

modern 21st-century mineralogical websites, such as MinDat; or such authoritative general works as *Merriam-Webster's International Dictionary*, the *Oxford English Dictionary* and the *Encyclopaedia Britannica*. This paper will set out the correct Greek word cited by the name's proposer, the most accurate transliteration and the most accurate translation; untangle the referencing situation and provide an overview and brief explanation of the most commonly encountered assumed etymologies and etymological errors.

The etymology of 'apatite'

The English word 'apatite' derives from the German word *Apatit*, which first appeared in print in 1786—in the form of a secondary report. German mineralogist Carl Abraham Gerhard (1738–1821) introduced the name, in a list of many names (synonyms) to describe a set of minerals with related characteristics, as 'den Apatit des Herrn Werners' (*Grundriß des Mineralsystems*, 1786, 281). Two years later in 1788, pioneering German geologist Abraham Gottlob Werner, the originator himself, published the name that he had coined and offered a very brief—but the original—etymology. Werner also acknowledged and reproduced Gerhard's list and the attribution to him. Werner published his paper in the relatively obscure *Bergmännisches Journal* (Erster Band, i.e., vol. 1; aka *Neues bergmännisches Journal*), and the passage from where the name is derived (pp 84/85) reads,

> Ich wies. . .diesem Foszile, als einer eigenen Gattung, sogleich eine Stelle in dem Kalkgeschlechte an; und ertheilte ihm—weil er bisher alle Mineralogen | in seiner Bestimmung irre gefuhrt hatte—den Namen Apatit, den ich von dem griechischen Worte απατάω (decipio) bildete, un welcher so viel als Trügling sagt.
>
> [I gave to this fossil, as its own type, immediately its own place among the species of calcium; and assigned to it—since until now it has misled all mineralogists in its identification—the name "Apatit", which I formed from the Greek word απατάω (*decipio*) and which means as much as "deceiver".]

Note here that the word 'fossil' is in its original usage: it referred to anything dug up, including minerals.

Werner did not directly translate απατάω into German but into Latin (though he did translate it indirectly into German as *Trügling*), which may suggest that he looked it up in a Latin–Greek dictionary. He was correct to choose the word *decipio* as the Latin translation (see, for example, Schrevel 1736; Hederich, 1766). Omitted from the Greek word as printed in the *Bergmännisches Journal* is the diacritic for smooth breathing over the opening letter α—that is, strictly, it should be ἀ. Following the practice of ancient grammarians and medieval scribes, it is conventional—and was conventional in Werner's time as the referenced dictionaries above attest—to print a diacritic on the first vowel of every ancient Greek word that starts with a vowel: the so-called 'rough breathing' diacritic if the vowel is aspirated (ἁ- = ha-), or 'smooth breathing' diacritic if it is not (ἀ- = a-). In this case, Werner may have consciously or accidentally omitted the (phonetically pointless) ἀ diacritic; but, just as likely, the typesetter of his paper may have omitted it

because it was too cumbersome or technically impossible to reproduce. Although not an error to have omitted the first diacritic, the fully correct form of the Greek verb that Werner chose is *ἀπατάω*.

The ancient Greek verb *ἀπατάω* is best transliterated as *apatáō* (less precisely as *apatao*); it is best translated as 'to deceive' (someone), 'to be deceptive' (used absolutely), or, in different contexts, 'to mislead', 'to be misleading' or 'to cheat' (Liddell, Scott and McKenzie, 1968, p. 181; Anastasiou, *Lexikon des frühgriechischen Epos*, 1955–79, pp 1001–3). The verb appears in Greek literature as early as the Homeric epics of the eighth century BC, the *Iliad* and the *Odyssey*, where Werner may have encountered it if his education had included learning Greek (which was not a given in the eighteenth century). The ancient Greek verb *ἀπατάω* derives from the noun *ἀπάτη* (transliterated as *apátē* or, less precisely, as *apate*, 'deceit'). The noun form does not have a well-defined etymology (Beekes, 2010; Chantraine, 1999). As a personification, the noun appears as Apate (*Ἀπάτη*), the female spirit of deception (see Hesiod, *Theogony* line 224). The noun and verb have remained common in Greek literature throughout the centuries, in prose as well as in poetry, and are used in modern Greek today.

The commonly encountered variants on *ἀπατάω*

A reader looking up 'apatite' in the standard secondary sources (textbooks, dictionaries, encyclopaedias, reputable mineralogical websites) with a view to checking the etymology will encounter little agreement among them: there are variations in the form of the verb that is used, variations in the transliteration and variations in the translations. And there is confusion as to whether to cite Werner or Gerhard as the primary source and which year to attribute to either of them (1786 or 1788).

The variations on *ἀπατάω* that one may commonly encounter can be grouped into five categories. For each category we offer some typical, though not exhaustive, examples. If we accept Werner's original, as set out above, as the original etymology, then all the examples given below are in error in some way.

(1) Greek verbs are customarily cited not in the infinitive form ('to deceive') but in the first person singular present active indicative form ('I deceive'). This is different from English and most modern languages, but similar to Latin. And this is precisely what Werner did by writing *ἀπατάω*—literally 'I deceive', but equivalent to the modern infinitive form 'to deceive' for lexicographical purposes. The examples below are very close to Werner's original in this respect, but are still flawed either with respect to diacritics (for original Greek or for transliteration) or to translation or to original reference.
   a. *ἀπατάω* in McConnell (1973). First alpha has correct diacritic, but the second diacritic is incorrect.
   b. *απατάω* (*apatao*) ('to mislead' or 'to deceive') in Dorozhkin (2013).
   c. *απαταω* in Elliott (1994).
   d. *apatao* ('to deceive') in Dana (1882). Also on the Gemadventurer website (accessed May 2015).
   e. *apatao* ('I am misleading') (Werner 1786) in Ďud'a and Rejl (1986). Also on the website Webmineral.com (accessed May 2015).
   f. *απαταω* ('to deceive') in Dana (1854).
   g. *ἀπατα῀ω* ('to deceive') in Palache, Berman and Frondel (1951), incorrect second diacritic.
   h. *apato* in Mineralienatlas.de website (accessed May 2015). If not simply misconceived, this is to be read as a transcription of the contracted form of *ἀπατάω*, namely *ἀπατῶ*, which is an unconventional way to cite the verb.

(2) Authors can ignore the convention in point (1) above and present the verb in the infinitive form, which is *ἀπατᾶν* (accentuated thus, preferred transliteration *apatân*). Not wrong from a derivation perspective, but it is unconventional and it is not what Werner wrote.
   a. *ἀπατ῀ν* ('to deceive') in *Encyclopaedia Britannica* (1926).
   b. *apatan* ('to deceive') in Blackburn and Dennen (1997).

(3) Because *ἀπατάω* is a denominative verb (a verb derived from a noun), it is theoretically acceptable to etymologise 'apatite' from the noun from which *ἀπατάω* is derived, which is *ἀπάτη* (accentuated thus, preferred transcription *apátē*), 'deceit'. Although theoretically fine, this is not what Werner did.
   a. *apate* ('deceit') in Deer, Howie and Zussman (1962); Chang, Howie and Zussman

(1998); Battey (1981); Klein and Hurlbut (1993).

b. *apatē* ('deceit') in *Webster's third international dictionary* (1961); also *Shorter Oxford English Dictionary* (1993); also *Collins English Dictionary* online (accessed May 2015); also *Merriam-Webster's Collegiate Dictionary* (2000), which erroneously gives the date of first appearance as 1803.

c. *apát(ē)* ('Trickery, fraud, deceit') in Dictionaryreference.com website (accessed May 2015).

d. *ἀπάτη* ('deception') in Greg and Lettsom (1858).

e. *apaté* ('deceit') in Kouřimský (1995; and as '*apate*, deceit' in the original 1977 edition).

(4) Very dubious is the spelling of the verb as *ἀπατέω* (*apatéō*, first person 'I deceive') or as *ἀπατεῖν* (*apateîn*, infinitive 'to deceive'). Although this latter alternative spelling is attested in some Greek sources, it is a non-standard, late, dialectal, variant spelling; and as with (3) above, it is not Werner's derivation.

a. απατειν (*apatein*) as given on the MinDat website (accessed May 2015).

b. *apatein* ('to deceive or to be misleading') on Wikipedia (accessed May 2015).

(5) Just wrong.

a. *ἀπατα΄ειν* in Dana (1892). Both diacritics incorrect; and combining (2) and (4) above.

Discussion and Summary

There is hardly a fully correct form of the etymology of 'apatite' (i.e., using the correct original Greek word, with accurate diacritics, with accurate transliteration and translation) to be found in the standard literature. Errors are further compounded by the complicated referencing situation: the first published example is not by the originator of the name; the originator does publish the name and its derivation, but two years after the first occurrence in print; the derivation occurs in a rare publication, tempting later authors to cite a secondary, and quite probably inaccurate, source. At present, we don't know exactly when Werner invented the mineral name *Apatit*: the first report was already second-hand. At best, we can venture that it was in the 1780s, 1786 at the latest because that is when Gerhard's book was published, but probably it was sometime beforehand.

Thus, unless one applies considerable literary delicacy and accuracy of phrasing, it is all too easy to write about the origin of the name 'apatite' and inadvertently make a material error, either in who coined the term, when it was coined, where it was first published, and so forth. Not only does the actual etymology need to be correct but the referencing needs to accurately describe who did what and when. In the case of 'apatite', trying to express this in a short form is fraught with phrasing problems. To give but one example, from dozens in the literature, and one that is superficially good: 'Gerhard reported in 1786 that the name 'apatite' had been coined by Werner from the Greek *απαταω*, to deceive'. (Elliott, 1994). This sentence misleads the reader by suggesting that Gerhard gives the etymology by Werner, which is not true because Werner did not give it until 1788. One has to be so careful lest the spirit of Apate continues to cast her spell.

To sum up. The mineral name 'apatite' is derived from the German *Apatit*, itself a name invented by A.G. Werner probably sometime in the mid-1780s, but first published by C.A. Gerhard in 1786, albeit acknowledging Werner as its originator. Werner himself later published both the name and its etymology in 1788 and chose the Greek verb *απατάω* (strictly *ἀπατάω*; transliterated as *apatáō*) as the derivation, which means 'to deceive' (someone) or 'to be deceptive', because, as he wrote, 'until now it has misled all mineralogists in its identification'.

Finally, are there any other names in the geological literature that are derived from the mischievous and deceiving Greek spirit of Apate? There are at least two. The first is a small (estimated 20cm in length), rare, North American fossil bird from the Late Cretaceous of Kansas (USA): *Apatornis celer*. The second is the plant-eating giant (23m) sauropod dinosaur *Apatosaurus*.

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