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Editorial

The origin of the term 'basalt'

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'Basalt' is a commonly and widely used word. This rock name is important in classification of volcanic rocks (e.g., TAS, QAPF; Le Maitre 2002) and ranks among the most frequent terms used in geology, including planetary science. However, probably no geologist ever started to think where this term actually comes from. On the occasion of the Basalt 2017 conference held in Kadaň (Czech Republic) and the investigation of the Stolpen Volcano (see Tietz et al. 2018, in this issue), the history of the word 'basalt' was examined more closely. The term was coined in 1546 by Georgius Agricola (1494–1555) in a short caption in *De Natura Fossilium* – an early modern era text representing the first attempt to scientifically classify minerals, rocks and fossils – referring to 'ash-grey marbles[1]' at the Stolpen Castle Hill near Dresden (Saxony, Eastern Germany):

"Some marbles are iron-coloured. This is the basalt that the Egyptians found in Ethiopia. Behind him the Meissner does not stand, either in the colour – he is particularly ferruginous – nor in hardness, which is so great that in the forge use him as an anvil. The Stolpen Castle of the Bishop of Meißen is built on this basalt. The columns are angular." (Agricola 1546, p 310; Fig. 1, translated from Latin in English).

Therefore, the Stolpen Castle Hill seems the global type locality for the rock 'basalt'(!), at least from historical perspective and without due regard to later developments in petrographical classifications. Consequently, the hill was designated as one of 77 national geotopes in Germany in 2006 (Goth and Suhr 2007). The Agricola's text was based on a description written 1,500 years before by Gaius Plinius Secundus, or Pliny the Elder (AD 23–79). He is famous among geologists for his descriptive report on the Vesuvius eruption in AD 79, and this volcanic eruption style is now called 'Plinian'. Some two years earlier, he penned the 36th volume of his *Naturalis Historia*, including the following short excerpt: "This same Egypt found in Ethiopia a (stone), which is called *basaltes*, of the colour and hardness of the iron, which gave the name." (Pliny the Elder ca. AD 77, translated from Latin in English). The antique text strongly resembles Agricola's description, lacking only the mention of columns.

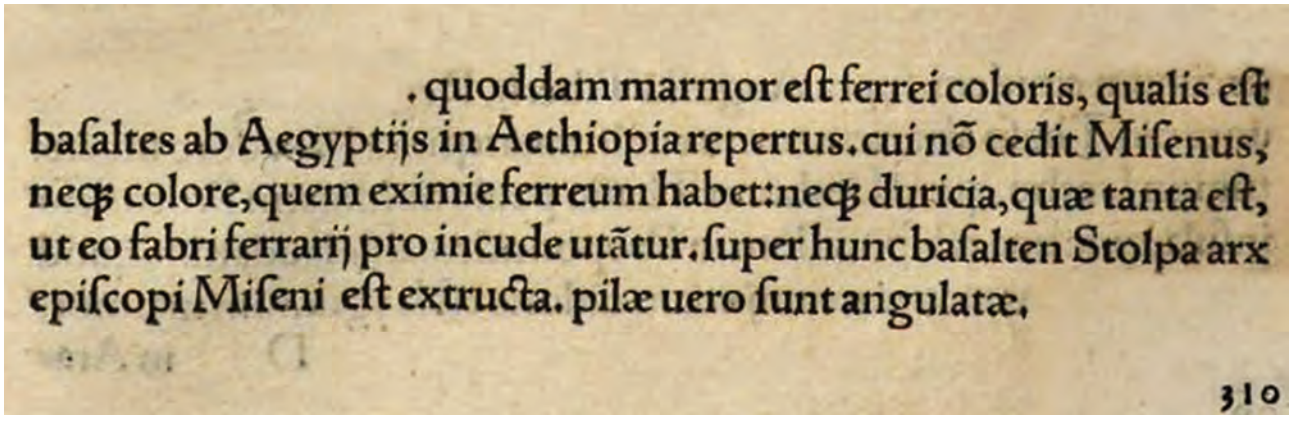
. quoddam marmor eſt ferrei coloris, qualis eſt
baſaltes ab Aegyptijs in Aethiopia repertus. cui nõ cedit Miſenus,
neq; colore, quem eximie ferreum habet: neq; duricia, quæ tanta eſt,
ut eo fabri ferrarij pro incude utãtur. ſuper hunc baſalten Stolpa arx
epiſcopi Miſeni eſt extructa. pilæ uero ſunt angulatæ.
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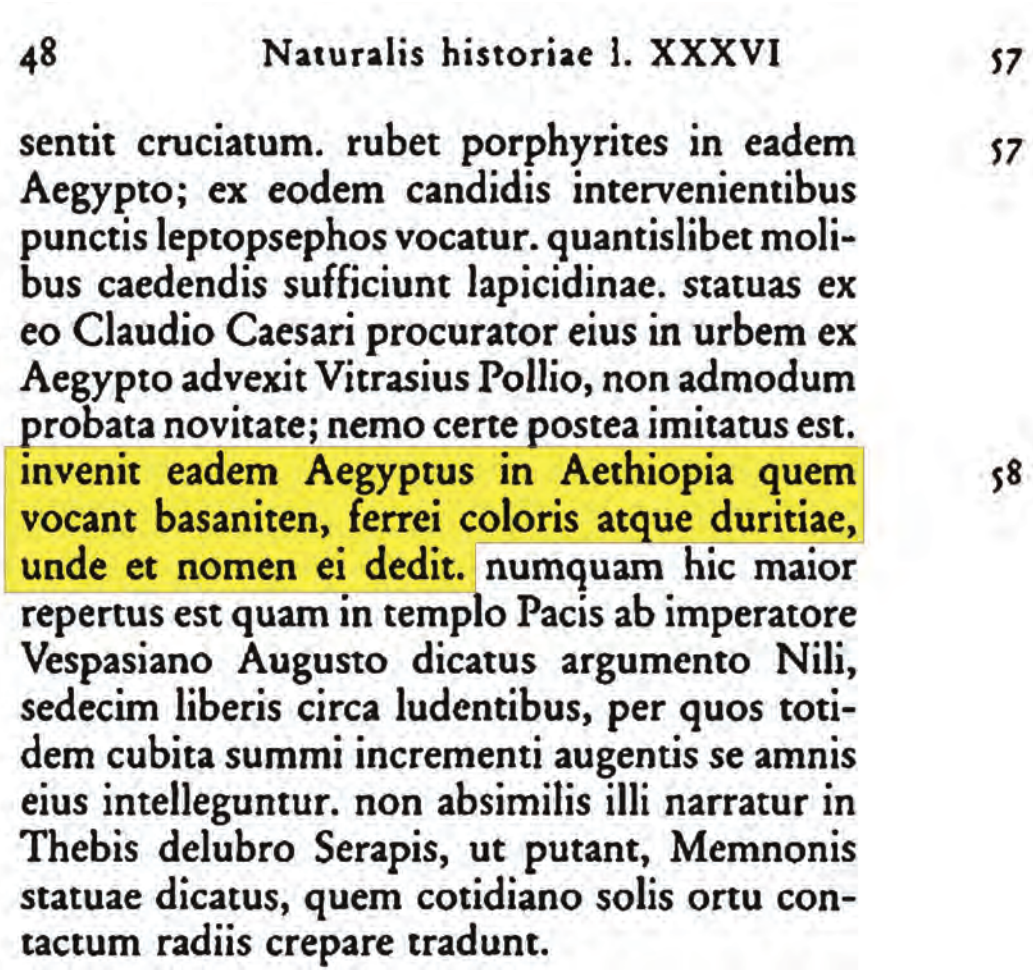
Fig. 1 The first mention of the term 'basalt' (Agricola 1546, p 310). Copy from: *https://tinyurl.com/Agricola-1546-Latin*.

The plot is simple up to this point, but thickens with the mid-19th Century discovery of the *Codex Bambergensis*, a handwritten book from the early middle age containing a copy of the 36th volume of Pliny's *Naturalis Historia* (Krafft 1994, p 114). Here, the passage about basalt contains one important difference: instead of *basaltes*, the term *basaniten i*s used (Krafft 1994, p 112, Fig. 2). Humboldt had already wondered why all ancient scholars including Pliny had consistently

[1] The term *marbles* is used by Agricola in reference to all rocks which can be polished. This includes not just marbles in modern sense but also granitic/rhyolitic rocks, and basalt (Agricola 1546, p 309)



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sentit cruciatum. rubet porphyrites in eadem 57
Aegypto; ex eodem candidis intervenientibus
punctis leptopsephos vocatur. quantislibet moli-
bus caedendis sufficiunt lapicidinae. statuas ex
eo Claudio Caesari procurator eius in urbem ex
Aegypto advexit Vitrasius Pollio, non admodum
probata novitate; nemo certe postea imitatus est.
invenit eadem Aegyptus in Aethiopia quem 58
vocant basaniten, ferrei coloris atque duritiae,
unde et nomen ei dedit. numquam hic maior
repertus est quam in templo Pacis ab imperatore
Vespasiano Augusto dicatus argumento Nili,
sedecim liberis circa ludentibus, per quos toti-
dem cubita summi incrementi augentis se amnis
eius intelleguntur. non absimilis illi narratur in
Thebis delubro Serapis, ut putant, Memnonis
statuae dicatus, quem cotidiano solis ortu con-
tactum radiis crepare tradunt.

Fig. 2 The original Pliny text with the basalt quote to which Agricola (1546) referred, highlighted in yellow. Here, the transcription error is already corrected from '*basaltes*' to '*basaniten*'. Copy from: Gaius Plinius Secundus (c. 77).

used the term *basaniten,* except for this isolated occasion (Humboldt 1790, p 52; see also Buttmann 1810, p 69). It thus appears that Pliny's original text must have referred to *basaniten* instead. *Basalt* likely stems from a transcription error in a younger copy of Pliny's writings used by Agricola. Linguists speak of corruptions or 'ghosts words' to describe such instances (Krafft 1994, p 114).

But this is not the only difficulty. The exact rock meant by Pliny is also unclear. The Ancient Greek word *basanos* means touchstone or "testing stone" (e.g., greywacke; Krafft 1994, p 113, footnote 23; Harell 1995 or lydite; Humboldt 1790, S. 47ff; Prescher 1958, p 336). Alternatively, the term 'basalt' may refer to the ancient landscape Baschan/Basan in Jordan/Syria (Kammerzell 2000, p 121, footnote 13), where much basalt exists.

Pliny (in *c.* 77) also made reference to two *basanite* sculptures, but both are missing or exist only as replicas today. Furthermore, the rock description provided by Pliny is relatively unhelpful; he gives only a few details relating to colour and hardness and fails to mention columns, the typifying feature of basalt. Indeed, only Agricola (1546, p 310; 315) refers to columns.

For the reasons mentioned above, it is difficult today to determine the linguistic origin of the word *basanite* ('basalt') or the rock type originally meant by Pliny. It can, however, be stated that Agricola first used the term 'basalt' in 1546 to describe the basaltic rock from the Stolpen Castle Hill in Saxony (East Germany).

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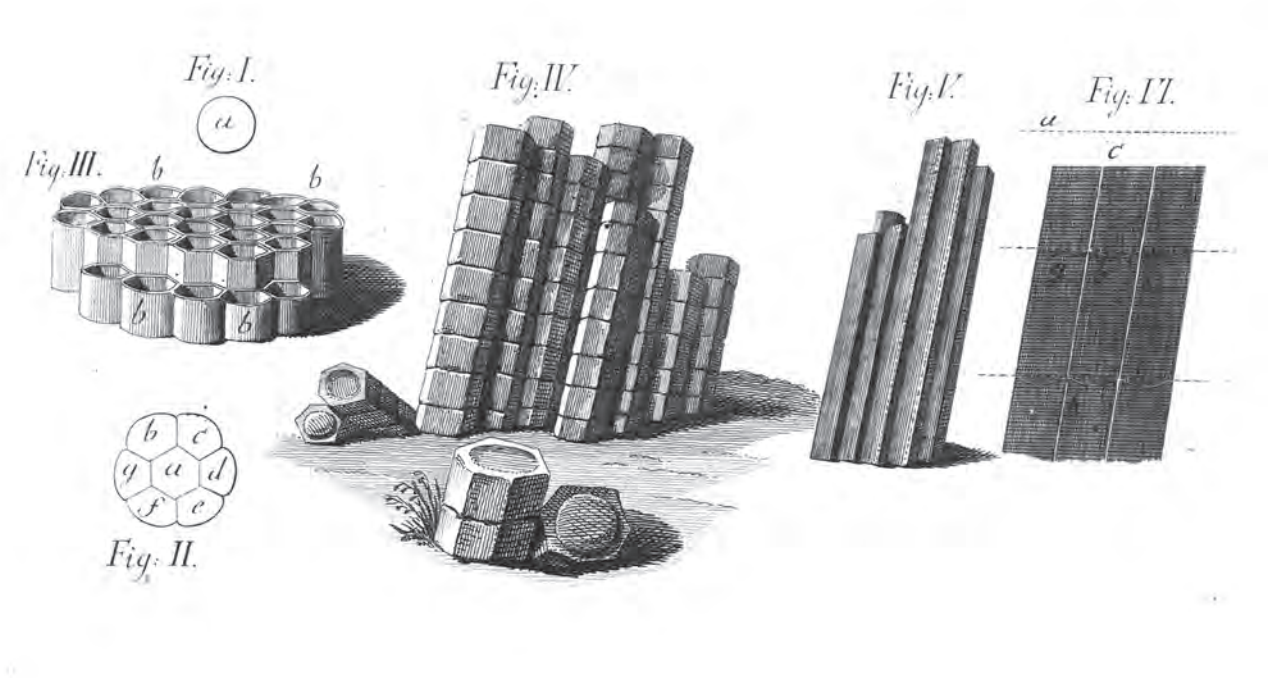

Fig. 3 Detailed views of basaltic columns from Stolpen. Copper engraving, 16 cm wide. Copy from Racknitz (1789, plate 1), Saxon State and University Library Dresden (SLUB) (Signature: Geolog. 1498, Digitalisation: df_db_000228).

Fig. 4 The Stolpen Castle, viewing a basaltic columnar jointing cliff near its main gate. View to west. Sepia colored outline etching from Adrian Zingg (1734–1816), 44.5 × 30.7 cm, *c.* 1775. Source: Staatliche Schlösser, Burgen und Gärten Sachsen GmbH, Burg Stolpen (photographer: Frank Höhler).