

## On marls and marlstones

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### Abstract

Marl and marlstone are antiquated geological terms that are commonly incorrectly applied in sedimentology. A marl is an unlithified deposit; a marlstone is a rock. The compositional definitions of marl and marlstone remain poorly delimited. We suggest that a more precise lithological term(s) is usually, perhaps always available for any so-called marl or marlstone.

*Key words:* semantics; terminology; sedimentology

As enthusiastic editors, we cringe whenever we trip over lax use of terminology and language that authors make, repeatedly, in the geological literature. We have over 50 years editorial experience between us and present this note as a brief suggestion for wider consideration. We have commented on the subject of this paper before (Pickerill *et al.*, 1998), but, sadly, identifying the disease hasn't facilitated the cure, at least so far.

Picard's (2010) book review of Alvarez (2009) first alerted us that the poor usage of the terms 'marl' and 'marlstone' has persisted into the 21<sup>st</sup> Century. Picard (1953) was concerned about the lax use of marlstone almost 60 years ago, a sad indication of the persistence of weak writing in our field. Another example of the same disease recently appeared in a student text on sedimentology. "A *marl* [author's italics] is a calcareous mudrock" (Tucker, 2011, p. 47), the briefest of mentions. It suggests that a marl lies within a heterogeneous continuum of poorly defined, fine-grained rocks with more or less carbonate content. Further, a marlstone is a rock, a marl is not. That such distinguished authors as Alvarez and Tucker fall into the marl or marlstone trap illustrates how this particular imprecision continues to pervades our geological thinking and publications.

Earlier, we highlighted how marlstone "... has commonly historically been adapted for convenience rather than a specific lithotype (Stow, 1985)" (Pickerill *et al.*, 1998, p. 12). The marlstones that we were discussing therein, in the Upper Pliocene Bowden Formation of southeast Jamaica, were so-called in the earlier literature, even though they "... are, lithologically and compositionally, extremely heterogeneous" (Pickerill *et al.*, 1998, p. 13, table 1). We decided to "... follow the AGI definition [Bates & Jackson, 1980, p. 382] whereby a marlstone is considered to be a general term referring to a mixed carbonate to fine-grained clastic rock with no specific limits on the

relative proportions of one or other components. Where other material is an integral component we use the appropriate qualifier (for example, sandy)." (Essentially the same definition is maintained in the latest edition of the *Glossary of Geology* (Neuendorf *et al.*, 2005, p. 396).)

Surely the time has come to be more dogmatic. The terms marl and marlstone have had their day. They are better suited to the trade of the sand and gravel merchant than to geology, offering a 'mineral' that can be spread as a lime on farm land (Neuendorf *et al.*, 2005, p. 396). We are confident that a more precise lithological term(s) is usually, perhaps always available, for any so-called marls or marlstones (Picard, 1953) to even a novice in rock description and classification. While marl and marlstone have continued to be used imprecisely in geology (compare with comments in Donovan, 2006), their relevance to modern sedimentology is, at best, questionable.

### References

- Alvarez, W. (2009), *The Mountains of Saint Francis: Discovering the Geologic Events that shaped our Earth*. W.W. Norton and Co., New York, 304 pp. [Not seen.]
- Bates, R. L. and Jackson J. A. (1980), *Glossary of Geology*. Second edition. American Geological Institute, Falls Church, Virginia, x+749 pp.
- Donovan, S. K. (2006), Nothing new: three recurrent failings of 'soft rock' manuscripts. *Palaeontological Association Newsletter*, #61, 62–64.
- Neuendorf, K. K. E., Mehl, J. P., Jr., and Jackson, J. A. (2005), *Glossary of Geology*. Fifth edition. American Geological Institute, Alexandria, Virginia, xiii+779 pp.
- Picard, M. D. (1953), Marlstone – a misnomer as used in Uinta Basin, Utah. *Bulletin of the American Association of Petroleum Geologists*, 37, 1075–1077.
- Picard, M. D. (2010), *The Mountains of Saint Francis: Discovering the*

- Geologic Events that shaped our Earth. Walter Alvarez, 2009. New York: W. W. Norton and Co. 304 pp. Hardcover, \$25.95. *Earth Sciences History*, **29**, 359–363.
- Pickerill, R. K., Mitchell, S. F., Donovan, S. K., and Keighley, D. G. (1998), Sedimentology and palaeoenvironment of the Pliocene Bowden Formation, southeast Jamaica. *Contributions to Tertiary and Quaternary Geology*, **35**, 9–27.
- Stow, D. A. V. (1985), Deep-sea clastics: where are we and where are we going? In Brenchley, P. J. and Williams, B. P. J. (eds.), *Sedimentology: Recent Developments and Applied Aspects*, 67–93. Oxford, Blackwell.
- Tucker, M. E. (2011), *Sedimentary Rocks in the Field: A Practical Guide*. Fourth edition. Wiley–Blackwell, Chichester, xi+275 pp.

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Mars' moons are among the smallest in the solar system. Phobos is a bit larger than Deimos, and orbits only 3,700 miles (6,000 kilometers) above the Martian surface. No known moon orbits closer to its planet. It whips around Mars three times a day, while the more distant Deimos takes 30 hours for each orbit. Phobos is gradually spiraling inward, drawing about six feet (1.8 meters) closer to the planet each century. Within 50 million years, it will either crash into Mars or break up and form a ring around the planet. To someone standing on the Mars-facing side of Phobos, Mars would take up a la marlstone definition: noun A rock containing clay materials and calcium and magnesium carbonates, with approximately the same composition as marl.... LoveToKnow. [www.yourdictionary.com/marlstone](http://www.yourdictionary.com/marlstone). APA Style. Marlstone. (n.d.). In YourDictionary. Retrieved from <https://www.yourdictionary.com/marlstone>. Noun. (countable and uncountable, plural marlstones). (geology) marl. Origin. marl + "½ stone. Marl or marlstone is a carbonate-rich mud or mudstone which contains variable amounts of clays and silt. The term was originally loosely applied to a variety of materials, most of which occur as loose, earthy deposits consisting chiefly of an intimate mixture of clay and calcium carbonate, formed under freshwater conditions. These typically contain 35%–65% clay and 65%–35% carbonate. The term is today often used to describe indurated marine deposits and lacustrine (lake) sediments which more accurately The spacecraft entered Mars™ orbit in February and after days of silence state media announced it had reached the crucial touchdown stage on Friday. The complicated landing process has been called the "seven minutes of terror" because it happens faster than radio signals can reach Earth from Mars, meaning communications are limited. The US rover launched a small robotic helicopter on Mars which was the first ever powered flight on another planet. The country has come a long way in its race to catch up with the US and Russia, whose astronauts and cosmonauts have decades of experience in space exploration. China successfully launched the first module of its new space station last month with hopes of having it crewed by 2022 and eventually sending humans to the moon.