

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 21st 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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