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Santana F. Afton* (csafton@email.wm.edu), CSU 0433, 110 Sadler Center, Williamsburg, VA 23185, and **Samuel Freedman, Justin Lanier** and **Liping Yin**. *Taming the Loch Ness Monster: Symmetries of Infinite Surfaces*. Preliminary report.

The mapping class group of a surface is an algebraic object that encodes the symmetries of the surface. Dehn showed that for many surfaces the mapping class group can be generated by certain infinite-order elements called Dehn twists. However, this result does not apply to “big” surfaces that have an infinite number of holes. Patel and Vlamis recently produced the first generating set for an important subgroup of the mapping class group of a big surface. Their generating set is comprised of Dehn twists as well as symmetries unique to big surfaces called handle shifts. Our work focuses on finding algebraic relations between Dehn twists and handle shifts. As a consequence, we show that big mapping class groups are generated by only a subset of their handle shifts. Additionally, we construct elements of arbitrary order for all surfaces of infinite genus. This is joint work with Justin Lanier and Liping Yin. (Received September 26, 2017)