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**Lillian B. Pierce\***, Duke University, Department of Mathematics, Durham, NC 27708. *On torsion subgroups in class groups of number fields.*

Imagine an hourglass: within one bulb, we picture analytic number theory; within the other, algebraic number theory. Pincered in between is the class number. As we imagine this hourglass, we visualize information trickling back and forth between the two fields, passing via the class number. And yet the constriction of the pinched neck suggests a certain inaccessibility...

Each number field has an associated class number, which measures the cardinality of the field's class group—a finite abelian group that encodes information about how arithmetic behaves within the field. It is natural to think of number fields in families—for example, all number fields of a fixed degree. Correspondingly, we can ask about the distribution of the class number, or of the class group, as the field varies over a family. Tantalizingly precise conjectures have been formulated, but remain out of reach.

We will describe a diverse array of recent work, with a particular focus on counting elements of a fixed order within the class group, that is, bounding the size of torsion subgroups. True to the hourglass shape we first envisioned, it turns out that this question is closely connected to deep open questions on both sides, including counting number fields, and the Generalized Riemann Hypothesis. (Received September 24, 2018)