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This is a talk about formulas. In the combinatorics literature, graded connected Hopf algebras are used to organize statistics on combinatorial gadgets and to uncover new formulas they satisfy. The category of “combinatorial Hopf algebras” was developed by Aguiar-Bergeron-Sottile to organize this zoo, and a terminal object was found (the Hopf algebra  $QSYM$  of quasisymmetric functions), enunciating precisely what types of formulas are constructible.

In this talk, we approach graded connected Hopf algebras from another direction, asking for structural formulas (e.g., for the action of the antipode, or for primitive elements) for the creatures in this zoo. We develop the bicategory of “bialgebras with coverings” and find its initial object. (It happens to be the graded dual of  $QSYM$ .) Time permitting, we illustrate our machinery with several examples. (Received August 19, 2014)