1041-33-286 **Robert S. Maier*** (rsm@math.arizona.edu), University of Arizona, Mathematics Department, Tucson, AZ 85721. *Families of quadratic and cubic hypergeometric transformations.* Preliminary report.

The quadratic and cubic transformations of the Gauss hypergeometric function ${}_2F_1$ are well known, as are the corresponding ones of ${}_3F_2$, which were found by Whipple and Bailey. In each of these transformations, the hypergeometric parameters are not free but are linearly constrained. We explain how any of these transformations can be viewed as the first member of an indexed family. In the 'higher' members, the transformed parameters must be computed algebraically. An instance is Kummer's classical quadratic transformation of ${}_2F_1$, which expresses ${}_2F_1\big(a,b;c;-4x/(1-x)^2\big)$ in terms of ${}_2F_1(a',b';c';x)$ if $c-a-b=1/2$, with a',b',c' affine linear functions of a,b,c. One may also express it in terms of a suitable ${}_4F_3$ if $c-a-b=3/2$, a ${}_6F_5$ if $c-a-b=5/2$, etc.; and in the latter cases, the transformed hypergeometric parameters satisfy nonlinear algebraic equations. The first companion of Whipple's quadratic transformation of ${}_3F_2$ was found by Niblett, but though a q-analogue of the companion was later found by Al-Salam, it was not widely realized that it is the first of an infinite family. We interpret such families with the aid of Riemann P-symbols and factorizations of difference operators. (Received August 12, 2008)