1109-05-161 **Richard P Anstee** and **Linyuan Lu*** (lu@math.sc.edu), Columbia, SC 29208. *Unavoidable Multicoloured Families of Configurations.*

Balogh and Bollobás [*Combinatorica 25, 2005*] prove that for any k there is a constant $f(k)$ such that any set system with at least $f(k)$ sets reduces to a k-star, an k-costar or an k-chain. They proved $f(k) < (2k)^{2^k}$. Here we improve it to $f(k) < 2^{ck^2}$ for some constant $c > 0$.

This is a special case of the following result on the multi-coloured forbidden configurations at 2 colours. Let r be given. Then there exists a constant c_r so that a matrix with entries drawn from $\{0, 1, \ldots, r-1\}$ with at least $2^{c_r k^2}$ different columns will have a $k \times k$ submatrix that can have its rows and columns permuted so that in the resulting matrix will be either $I_k(a, b)$ or $T_k(a, b)$ (for some $a \neq b \in \{0, 1, \ldots, r-1\}$), where $I_k(a, b)$ is the $k \times k$ matrix with a's on the diagonal and b's else where, $T_k(a, b)$ the $k \times k$ matrix with a's below the diagonal and b's elsewhere. We also extend to considering the bound on the number of distinct columns, given that the number of rows is m, when avoiding a $tk \times k$ matrix obtained by taking any one of the $k \times k$ matrices above and repeating each column t times. We use Ramsey Theory. (Received January 30, 2015)