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In 1962, Freeman Dyson conjectured that the constant term in the Laurent polynomial $\prod_{1 \leq i \neq j \leq n} (1 - \frac{x_i}{x_j})^{a_j}$ (let us call this the "Dyson product") is the multinomial coefficient $\frac{(a_1+a_2+\dots+a_n)!}{a_1!a_2!\dots a_n!}$. Dyson's conjecture was first proved independently by Gunson and Wilson. The most compact and elegant proof, however, was supplied by I.J. Good in 1970. We present a case study in experimental (yet rigorous!) mathematics by describing an algorithm which automatically conjectures, and then supplies proofs (inspired by Good's proof) of closed form expressions for extensions of Dyson's conjecture to coefficients beside the constant term in the Dyson product. (Received August 24, 2006)