ABSTRACT. The genesis of this paper is the construction of a new operator that, when combined with a theorem of Herrero, settles a question of Herrero. Herrero proved that a strictly cyclic operator on an infinite dimensional Hilbert space is never triangular. He later asks whether the adjoint of a strictly cyclic operator is necessarily triangular. We settle the question by constructing an operator T for which both T and T^* are strictly cyclic. We make a detailed study of this *bi-strictly cyclic* operator which leads to theorems about general bi-strictly cyclic operators. We conclude the paper with a comparison of the operator space structures of the singly generated algebras $\mathcal{A}(S)$ and $\mathcal{A}(T)$, when S is strictly cyclic and T is bi-strictly cyclic.