

1056-97-606

Daniel J Teague* (teague@ncssm.edu), NCSSM, 1219 Broad Street, Durham, NC 27705.

Probability and Determinism at the Battle of Trafalgar.

The classical Lanchester models for the Battle of Trafalgar ($dA/dt = -bB$ and $dB/dt = -aA$) generate both student interest and insight into this historical battle. But, with given initial conditions and parameter values, the same side always wins.

If we use a queuing model approach (if you are in state AB now, then you must have been in $(A+1)B$ or $A(B+1)$ or $(A+1)(B+1)$ or AB in the time interval before), we can create a probabilistic model for the battle over time. In the probabilistic model, we have the much more satisfying prospect of predicting how likely one side is to prevail, and what the most likely end stage of the battle will be. (Received September 14, 2009)