1109-92-135 **'Kale Oyedeji*** (kale.oyedeji@morehouse.edu), Department of Physics, Morehouse College, Atlanta, GA 30314-3773, and **Ronald E. Mickens** (rmickens@cau.edu), Department of Physics, Clark Atlanta University, Atlanta, 30314. *A New Phenomenological Law of Cooling.* Preliminary report.

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If an object at temperature T is introduced into a uniform environment having temperature $T_e < T$, then the object cools to T_e. Likewise, if $T_e > T$, the object warms to T. Under the condition, $|T - Te|\ T_e$, these situations are usually modeled by the Newton cooling law,

$$\frac{dT}{dt} = -K\left(T - T_e\right), \tag{1}$$

where K is a constant parameter, having the physical units of inverse time. Since all the solutions of (1) approach T_e and do so asymptotically, I.e., as it cannot provide a dynamically consistent model for cooling/heating, because it is observed that the actual physical system achieves the equilibrium temperature, ${}_{Te}$, in a finite time. We present arguments to show that a correct, phenomenological law of cooling should have the structure [1]

$$\frac{dT}{dt} = -K\left(T - T_e\right)^{\alpha}, \tag{2}$$

where α is a parameter satisfying the restriction, $0 < \alpha < 1$.

Reference

1. R.E. Mickens, Georgia Journal of Science, Vol. 67 (2009), 55. (Received January 28, 2015)