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## **The evolution of ageing : concepts, causation and calculus**

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## Stellingen behorende bij het proefschrift

### *The Evolution of Ageing: Concepts, Causation and Calculus*

1. Declining selection gradients with age do not imply inevitability of the evolution of ageing. (this thesis)
2. There is no prior evolutionary biological rationale for favoring investment in offspring over investment in own survival. (this thesis)
3. Evolutionary explanations cannot be separated in proximate (mechanistic) versus ultimate (evolutionary) explanations. (this thesis)
4. Yet, if anything, ageing is a mechanistic issue. (this thesis)
5. Ageing may increase life expectancy. (this thesis)
6. The sum of component causes for a biological outcome is always at least 300% and there is no 'most causative cause'. (Rothman, KJ (2012) *Epidemiology. An introduction.* Oxford University Press, New York)
7. The intricate and complex process that ageing is, cannot and should not be reduced to age-specific mathematical expressions and verbal extrapolations thereof. (Kirkwood, TBL (1977) *Evolution of ageing.* *Nature* 270:301-304)
8. Ageing could be a hyperfunction syndrome. (Blagosklonny, MV (2009) *TOR-driven aging - Speeding car without brakes.* *Cell Cycle* 8:4055-4059)
9. Evolution tinkers. (Jacob, F (1977) *Evolution and tinkering.* *Science* 196:1161-1166)
10. Mathematics is the clearest language developed in the history of mankind.
11. Had he been an epidemiologist, Leo Tolstoy would have been a hundred years ahead of his time.

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