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A. Glossary of terminology.

Aging: Has been used to refer to two phenomena. One is the mere passage of time, without reference to any change. The other is deterioration with the passage of chronological time. I use it in the latter sense, with the exception of some particular chapters, in which it is explicitly stated otherwise. Compare with: Senescence.

Ceteris paribus: All other things being equal. A clause used across sciences, particularly in economics, indicating that a situation is considered in which only one element is different. It allows isolation, at least locally, of the effect of the element under discussion.

(Darwinian) fitness: The propensity to assure and increase the presence of an entity's heritable material over time.

Functional: A 'function of a function' that takes a function as input and returns a scalar*.

Functional calculus: The calculus that pertains to functionals*.

Gene: The molecular unit of heredity, made up from DNA. To my knowledge, a good word for 'unit of heredity' as a general concept, not restricted to DNA, is missing. Hence, I stick to 'gene' also at places where the modality of heredity should not necessarily be DNA.

Genotype: The genetic composition of an organism.

Germ cells: Cells form which a next generation derives. Compare with: Soma.

Homeostatis: The property of a system that internal conditions are kept stable, in particular in physiology.

Life history: The collective of timing and magnitude of life events, such as age at maturity, lifespan, number of reproductive bouts, and aging. The central proposition of life history theory is that like organs and the color of a butterfly, life history evolves.

Mutation: A change in a sequence of DNA. In general, it has been found that only a limited number of DNA sequences have a specific effect; most sequences just do not have any noticeable biological activity. Hence, most random mutations lead to loss of function.

Phenotype: The collective of physiological properties of an organism. Depends on genotype, other mechanisms of heredity, the current environment, and an the complete past of environment-phenotype interaction.

Scalar: A quantity that is described by a single value, such as life expectancy. As opposed to quantities that are described by a collection of values, such as age-specific survival.

Senescence: Refers to deterioration with age. Compare with: Aging. Note: various authors have made a distinction between aging as the passage of time versus senescence as deterioration with that time. The propensity to make such a distinction is not widespread. Unless indicated otherwise, I do not adhere to this distinction.

Soma: Sanskrit for 'body'. Used to refer to that what does not form the basis of a next generation. Compare with: Germ cells.

Stable population theory: Specified, time invariant birth and death rates as a function of age asymptotically lead to a stable distribution of organisms over age groups, and fixed reproductive values for each age group. It is these distributions and functions that stable population theory refers to.

Survival: The state of being alive or not. Sometimes a difference is made between survival as the probability of surviving a *period*, versus survivorship as the probability of surviving from age zero to a specified age.

Trade-off: Two objectives cannot be realized at the same time, at least not to the same extent. A common trade-off in life history theory is a trade-off between reproduction and survival. It is believed that high fertility comes at a cost to survival. Notice that the existence of a trade-off does not prohibit that some organisms are just better at everything: Bill Gates can buy more apples, houses, cars and what not than all of us together (barring the off chance that the readership of this thesis includes Bill Gates), but still, even for Bill Gates it is true that he can spend every Dollar only once.