Strive to survive

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Stellingen behorende bij het proefschrift

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The Skylark's ecology and physiology in an annual-cycle perspective

Arne Hegemann

1.) Because different stages of the annual cycle are linked via carry-over effects, one has to study birds through their complete annual cycle to understand how birds adapt to changes and maximize their fitness (this thesis).

2.) To understand how ecological and evolutionary processes are mediated by physiology, it is not enough to measure many physiological components, but one also needs to embed them thoroughly in natural history (partly contra Cohen *et al.* 2012 TREE; this thesis).

3.) The common phenomenon of partial migration is ideally suited, yet rarely explored, for within-population studies of the causes and consequences of migration (Chapman *et al.* 2011 Oikos; this thesis, chapter 10).

4.) Distinguishing between baseline immune functions and induced immune responses is important as the two have different costs and benefits (Adamo 2004 Anim Behav; this thesis, chapters 4,5,6,11).

5.) Some immune responses are not traded off in spite of their costs. Instead they are maintained because of their benefits (this thesis, chapters 5,6,11).

6.) Fundamental studies in ecology do not only provide biological insights. They can also provide data that facilitate more effective conservation measures (Sutherland 2004 TREE; Piersma 2007 J Ornithol; this thesis, chapter 11).

7.) The simple statement 'the population is colour-ringed' conceals the effort invested in thousands of hours of field work. This effort is often repaid, not only in the form of scientific knowledge of birds as individuals, but also by the simple pleasure gained from following the lives of old friends (Davies 1992; this thesis).

8.) Studying a cryptic species with well-hidden nests forces you to understand the behaviour of your study species in great detail. The resulting advantages for interpreting results and developing new ideas outweigh the disadvantages of time spent on challenging field work and of limitations on experiments (this thesis).

9.) The probability that a study will generate at least one paper per year in a high impact journal increases rapidly with the number of study years, suggesting that the originality of the work increases with the duration of a study (Clutton-Brock & Sheldon 2010 TREE).

10.) The terms "life-cycle stage" and "life-history stage" are often misused to describe a phenomenon much better called "annual-cycle stage" (e.g. Piersma 2002 Int Comp Biol; Pap *et al.* 2010 Naturwissenschaften; Versteegh *et al.* 2012 J Exp Biol; Lattin *et al.* 2012 Gen Comp Endocr).

11.) In clinical and laboratory studies, variation among individuals is often considered statistical noise. Ecological studies are explicitly interested in explaining individual variation (Ardia & Schat 2008 in Davison *et al.* (eds); this thesis, chapters 2,4,9,10).

12.) "The alpine tundra is a land of contrasts and incredible intensity. You are entering a special world. Life here is strained by scouring winds and bitter cold, and only the hardiest survive." (from an information board at Rocky Mountain National Park, USA). Replace "alpine tundra" with "scientific world," and the statement is still appropriate.

13.) Mission accomplished.