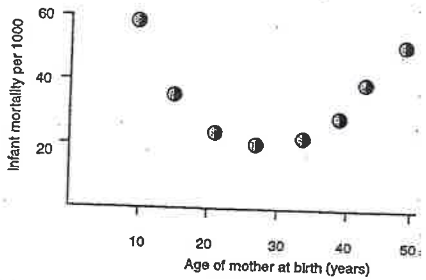
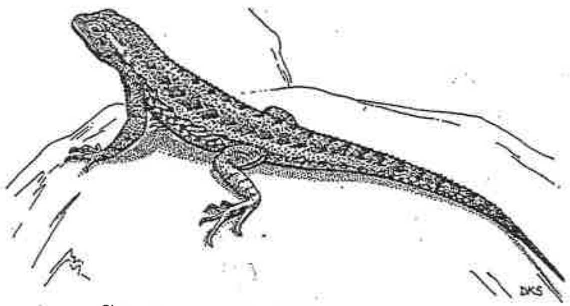


Fig. 8.1 Infant mortality rate as a function of mother's age, humans, United States 1960–61, based on 107 038 infant deaths documented by the National Center for Health Statistics. Each point is the mean of a 5-year age class (after Stafford, unpublished data).

4-3



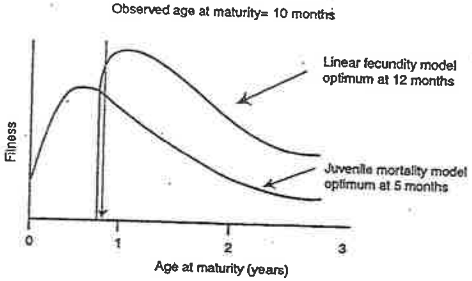
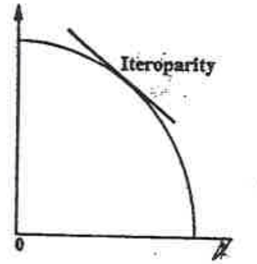
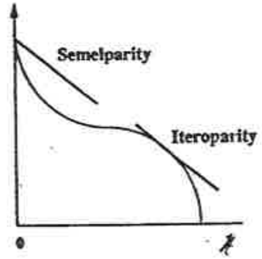
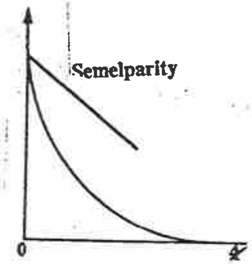


Fig. 8.2 The fence lizard, *Sceloporus*, matures at about 10 months (by Dafila K. Scott). Optimality models for age at maturity are reasonably successful if they assume that the main advantage of delaying maturity is the increased fecundity that comes with larger body size.

4-3A







4-1

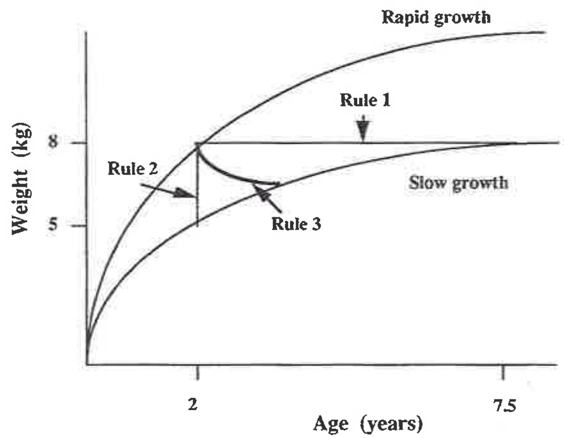
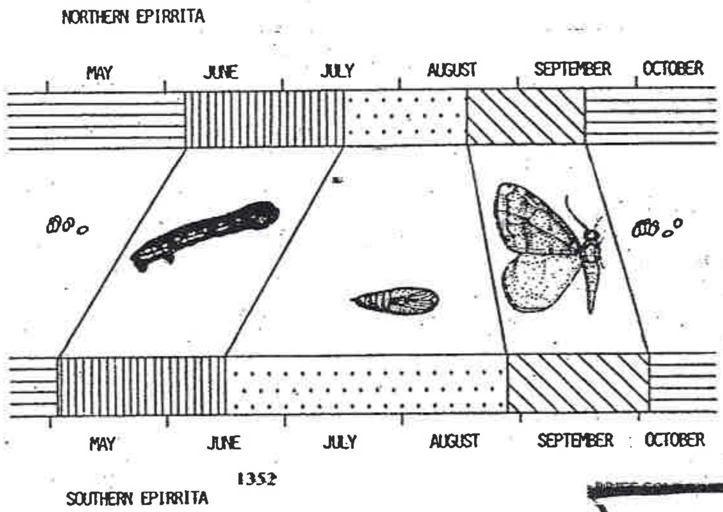


Figure 6.10 A graphical interpretation of three simple rules of thumb for the maturation event. Rule 1: always mature at the same size. Here the problem is mortality risk. Rule 2: always mature at the same age. Here the problem is fecundity cost. Rule 3: strike a compromise between mortality risk and fecundity cost and produce a reaction norm where each maturation event is optimal for the given growth conditions (after Stearns 1983*a*).

4-4

4-5



1352

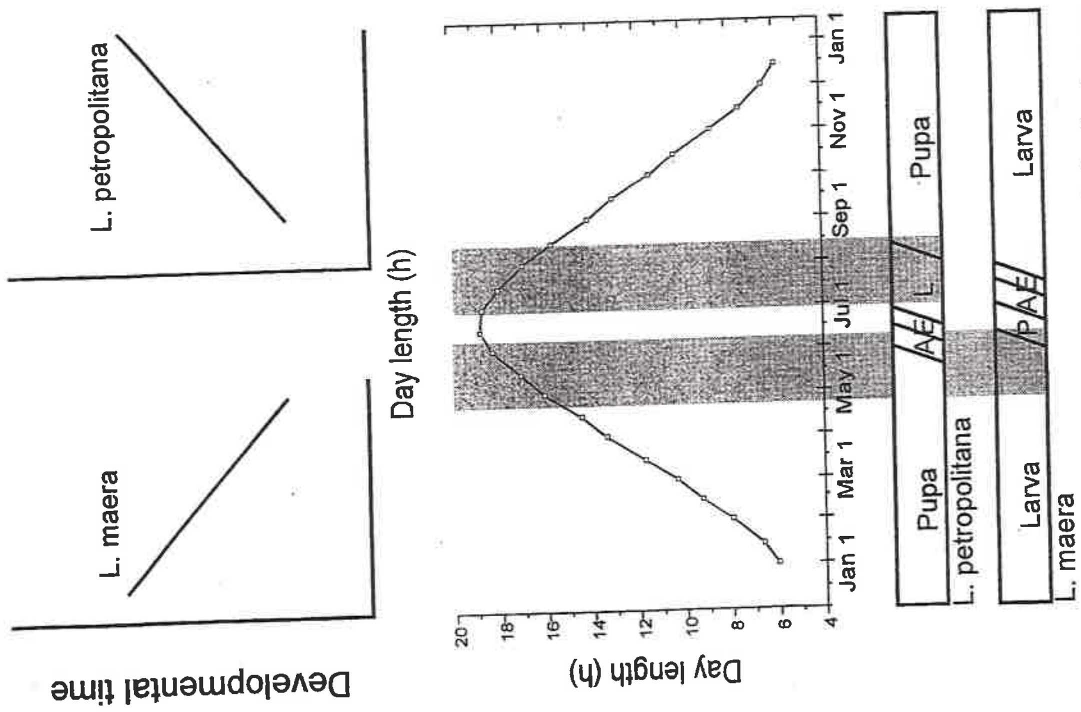
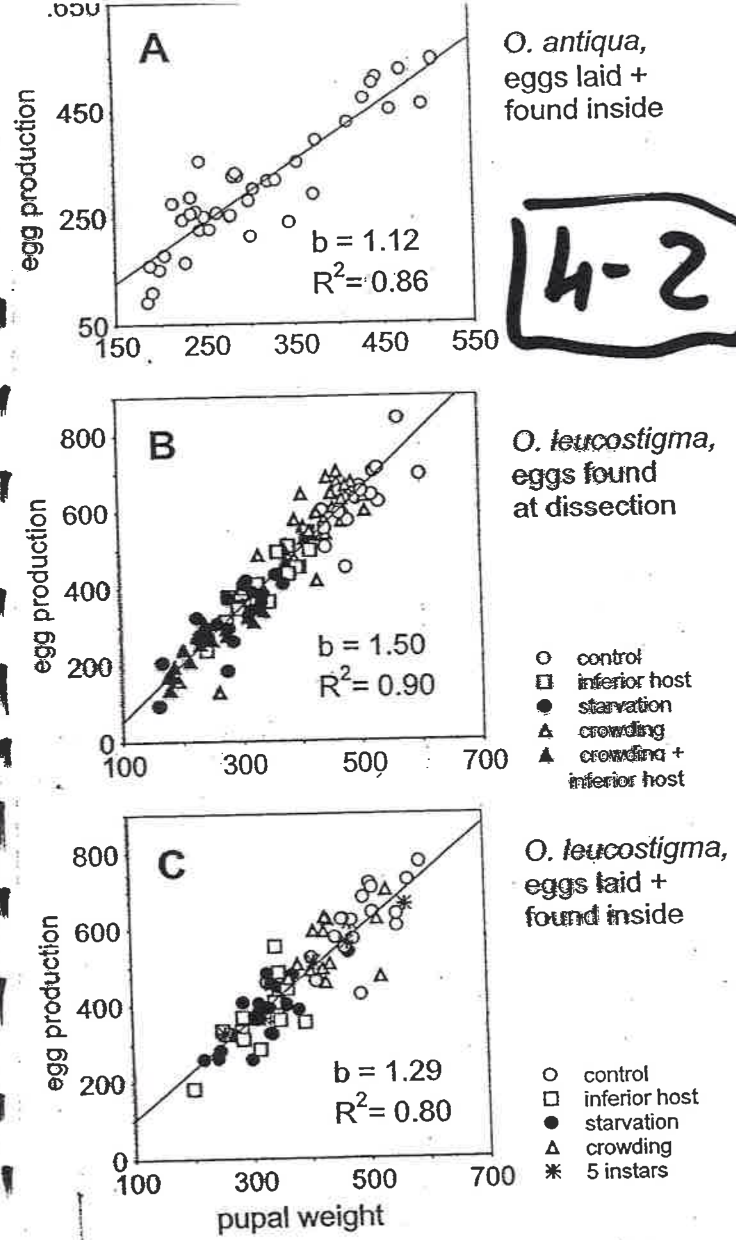


FIG. 1. (Bottom) Phenology of *Lasiommata petropolitana* and *Lasiommata maera* in Sweden. A, Adult; E, Egg; L, Larva; P, Pupa. (Center) Variation in day length in central Sweden over the year. Shaded areas extending from the phenologies of *L. petropolitana* and *L. maera*, respectively, highlight day lengths experienced by late larval instars of each species. (Top) Predicted reaction norms, assuming short developmental times at dates late in the season.

14-6

4-2



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4-7A

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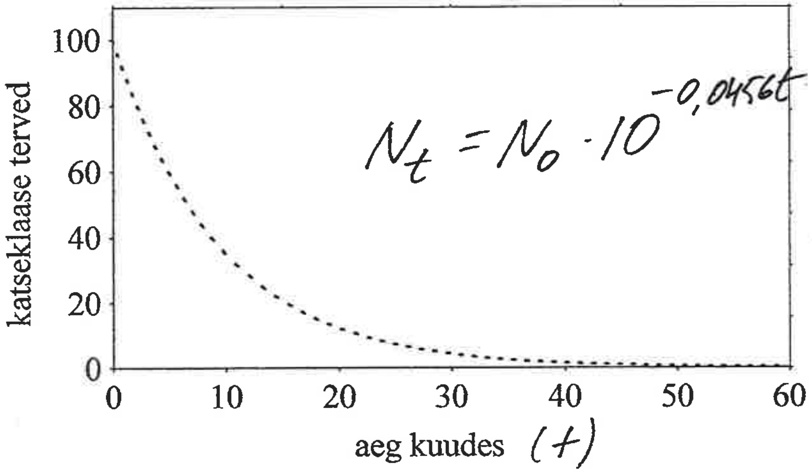

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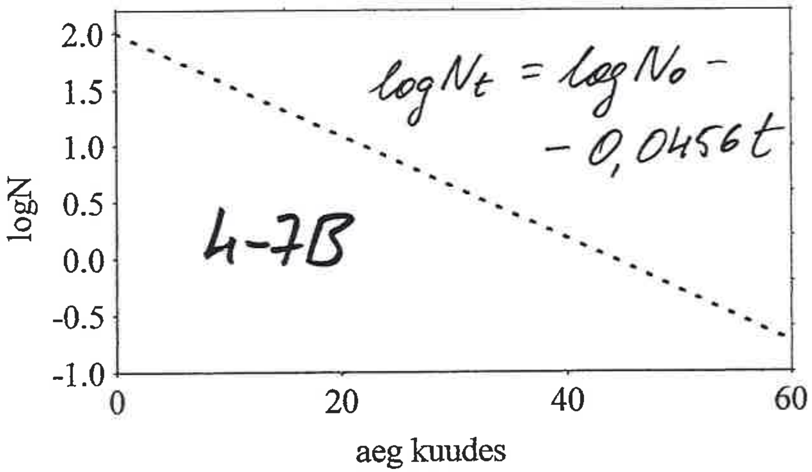


4-8

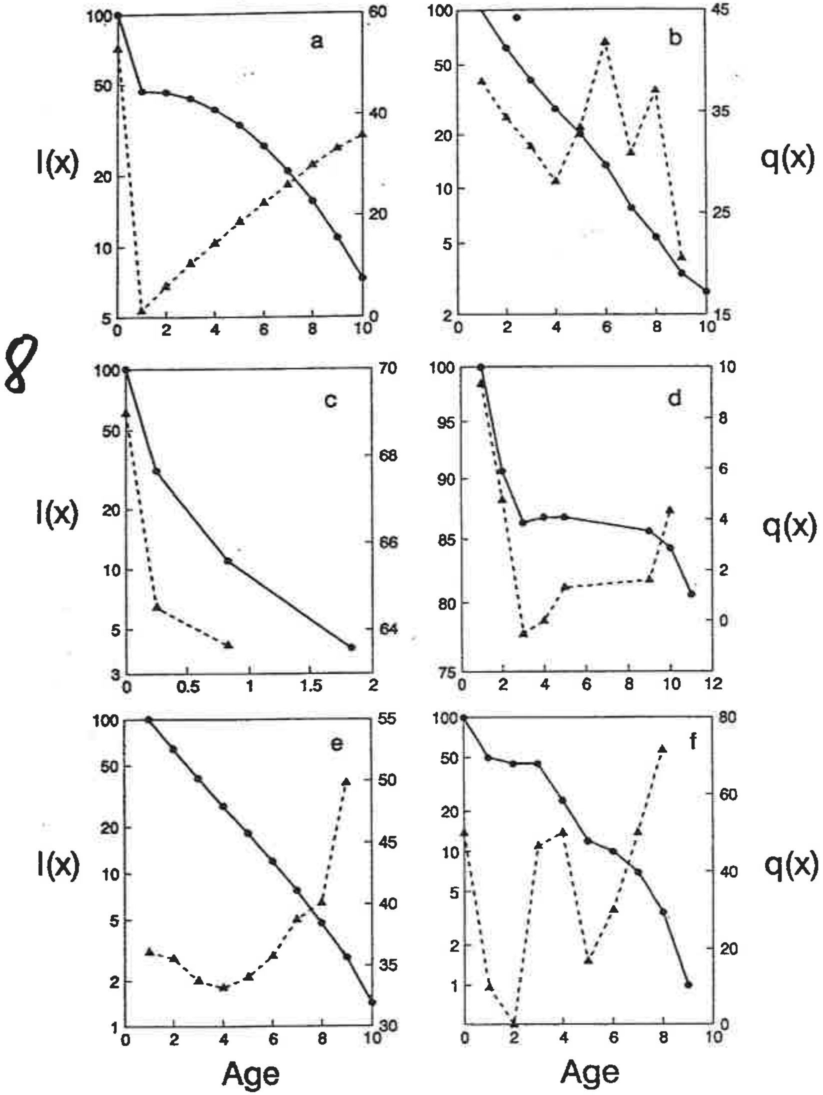


Figure 5.1. Some illustrative schedules of survival, $l(x)$, and mortality, $q(x)$. For convenience the $l(x)$ and $q(x)$ values have been multiplied by 100. All time scales are years except for the one for dragonfly nymphs, which is in months. Organisms displayed are (a) Himalayan thar (Caughley 1966), (b) lapwing (Deevey 1947), (c) lizard (Tinkle and Ballinger 1972), (d) dragonfly nymphs (Wissinger 1988), (e) clam (Brousseau and Baglivo 1988), and (f) grass (Sarukhán and Harper 1973).

h-9

Table 8.1 Selected maximum recorded lifespans in invertebrates. From Comfort (1979)

	Scientific name	Common name	Maximum lifespan (years)
Coelenterates	*Actinia mesembryanthemum*	Sea anemone	65–70
	Cereus pedunculatus	Sea anemone	85–90
Flatworms	*Taeniorrhynchus saginatus*	Tapeworm	35+
	Planaria maculata	Planaria	6–7
Rotifers	*Asplanchna sieboldii*	Rotifer	0.03–0.06
	Keratella culeata	Rotifer	0.08
Annelids	*Lumbricus terrestris*	Earthworm	5–6
	Allelobophora longa	Earthworm	5–10
Crustaceans	*Homarus* spp.	Lobster	50
	Balanus balanoides	Barnacle	5+
Termites	*Neotermes castaneus*	Termite	25+
Butterflies	*Maniola jurtina*	Butterfly	0.2–0.75
Beetles	*Blaps gigas*	Giant beetle	10+
	Carabus auratus	Scarab beetle	1–3
Bees and ants	*Apis mellifera*	Honeybee queen	5+
	Formica fusca	Ant queen	15+
Echinoderms	*Echinus esculentis*	Edible sea urchin	8+
	Asteria rubens	Sea star	5–6
Molluscs	*Chiton tuberculatus*	Chiton	12
	Haliotis rufescens	Red abalone	13+
	Limax flavus	Slug	3
	Cepaea nemoralis	Striped garden snail	5–6
	Mytilus edulis	Edible mussel	8–10
	Pecten maximus	Scallop	22
	Anodonta piscinalis	River mussel	10–15
	Loligo pealii	Squid	3–4
	Octopus vulgaris	Octopus	3–4

h-10

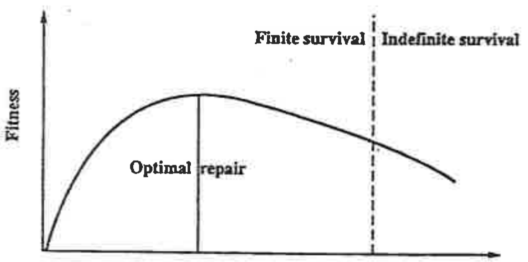
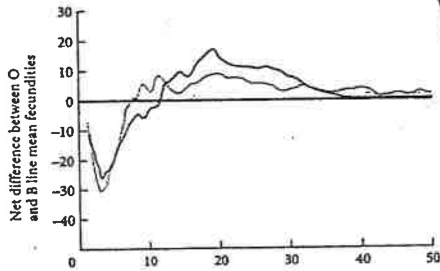


Figure 8.17 Disposable soma theory predicts that the optimal level of investment in repair will be below that required for indefinite somatic survival (after Kirkwood 1985).

FIGURE 19.6 The difference in fecundity (eggs laid per female per day) between populations of *Drosophila melanogaster* selected for late reproduction (O) and for early reproduction (B). The fecundity of the B line is taken as a standard, and is set at zero. The three O populations, selected for late reproduction, have relatively high fecundity at later ages, but depressed fecundity at early ages. (After Rose 1984.)

h-11



h-12

Table19.2 Comparatively prevalent pathological processes associated with the senescent phenotype of *Homo sapiens sapiens* (modified from Martin 1993)

Body system	Phenotype
Cardiovascular	Atherosclerosis, arteriolosclerosis, medial calcinosis, basement membrane thickening of capillaries; hypertension; increased susceptibility to thromboembolism; myocardial lipofuscinosis; myocardial hypertrophy with interstitial fibrosis, valvular fibrosis and valvular calcification (calcific aortic stenosis)
Central nervous	β-Amyloid depositions; lipofuscin depositions; neuritic plaques; neurofibrillary tangles; gliosis; diminished synaptic density; regional neuronal loss, leading to disorders such as Parkinson's disease and Alzheimer's disease
Peripheral nervous	Segmental demyelination with decreased nerve conduction velocity
Special senses	Loss of visual accommodation; ocular cataracts; senile macular degeneration; loss of high frequency auditory acuity; loss of olfactory acuity
Respiratory	Chronic obstructive pulmonary disease; interstitial fibrosis; decreased vital capacity
Renal	Glomerulosclerosis and loss of nephron units; interstitial fibrosis
Male reproductive	Decreased spermatogenesis; hyalinization of seminiferous tubules; benign prostatic hyperplasia; adenocarcinoma of the prostate
Female reproductive	Depletion of ovarian primordial follicles; ovarian stromal cell hyperplasia; endometrial atrophy and hyperplasia; endometrial carcinoma, carcinoma of breast and ovary, 'fibroid' tumours of the myometrium (leiomyomas); vaginal atrophy
Musculoskeletal	Skeletal muscle atrophy and interstitial fibrosis; osteoporosis, osteoarthritis
Haematopoietic	Anaemias (including pernicious anaemia); chronic lymphocytic leukaemia; chronic myelogenous leukaemia, myelodysplastic syndromes; myelofibrosis; myoclonal gammopathies and multiple myeloma; polycythaemia vera
Endocrine	Interstitial fibrosis of thyroid; hypercortisolaemia; asynchrony of growth hormone release; amyloid depositions in β-cells of pancreatic islets; non-insulin-dependent diabetes mellitus
Gastrointestinal	Colonic polyps and adenocarcinoma; diverticulosis of colon; gastric anal atrophy; fatty infiltration and brown atrophy of pancreas; adenocarcinoma of pancreas; cholelithiasis; periodontal disease
Integumentary	Epidermal atrophy; pigmentary alterations; basophilic alteration of collagen; senile elastosis; senile keratoses (especially in sun-exposed skin); regional atrophy and hypertrophy of adipocytes; thinning and greying of hair of scalp and body

Tabel. Nelja eri strateegiat viljeleva genotüübi parameetrid.

genotüüp	kohasuse aritmeetline keskmine	kohasuse dispersioon üle aastate	Kohasuse geomeetriline keskmine	paremus-järjestus
A1	(2+0,6)/2=1,3	0,49	$(2*0,6)^{1/2} = 1,095$	3.-4.
A2	(2+0,6)/2=1,3	0,49	$(2*0,6)^{1/2} = 1,095$	3.-4.
A3	(1,2+1,2)/2=1,2	0	$(1,2*1,2)^{1/2} = 1,2$	2.
A4	(1,9+0,6)/2=1,25	0	$(1,25*1,25)^{1/2} = 1,25$	1.