



COMPETIÇÃO E COEXISTÊNCIA EM COMUNIDADES VEGETAIS


Leituras:

Gurevich *et al.* cap.10

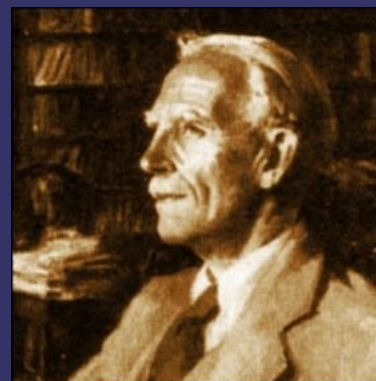
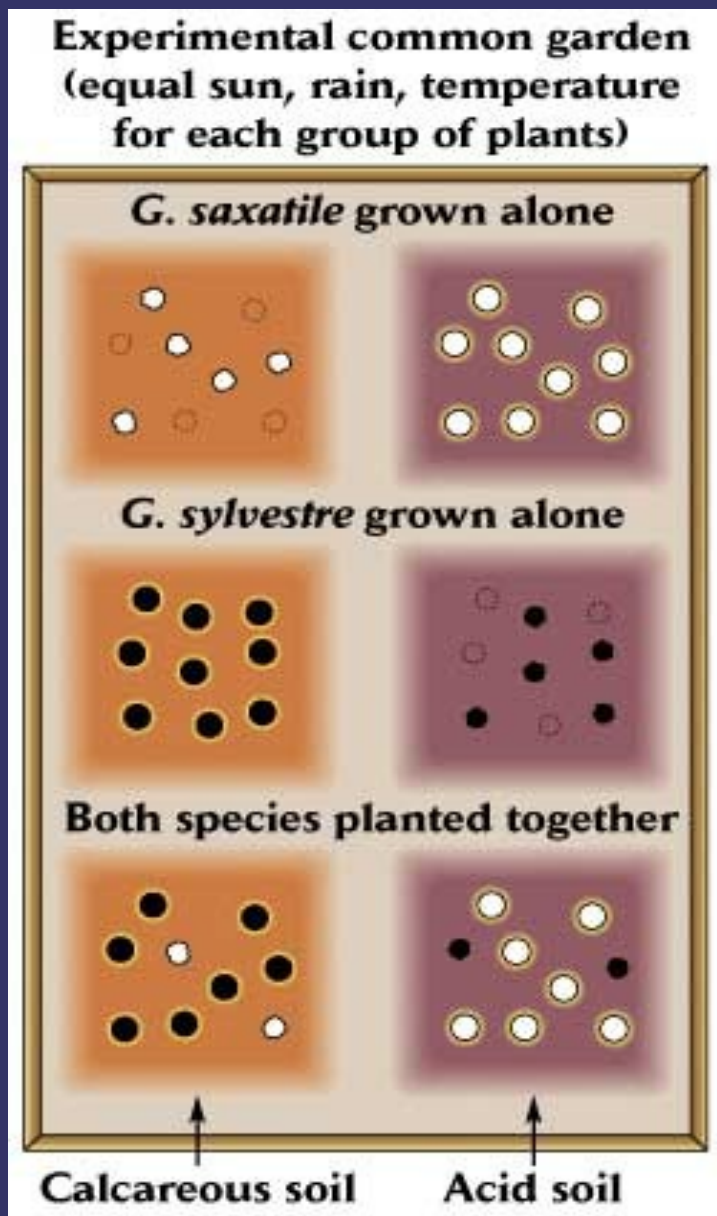
Begon *et al.* cap.8



TÓPICOS

- Definição de competição e seus problemas
 - Detecção de competição entre plantas
 - Modelos fenomenológicos
 - Modelos mecanísticos
 - Nicho e estrutura de comunidades
 - Paradigma Hutchinsoniano
- 

COMPETIÇÃO: UM TEMA FUNDADOR



Sir Arthur Tanlsey



Galium saxatile

TIPOS DE INTERAÇÃO

INTERAÇÃO	Presente	Ausente
COMPETIÇÃO	- / -	0 / 0
PARASITISMO	+ / -	- / 0
FACILITAÇÃO	0 / +	0 / 0
MUTUALISMO	+ / +	- / -

COMPETIÇÃO POR RECURSOS



LUZ: floresta equatorial pluvial,
Barro Colorado, Panamá



ÁGUA: deserto de Sonora, México

COMPETIÇÃO POR INTERFERÊNCIA

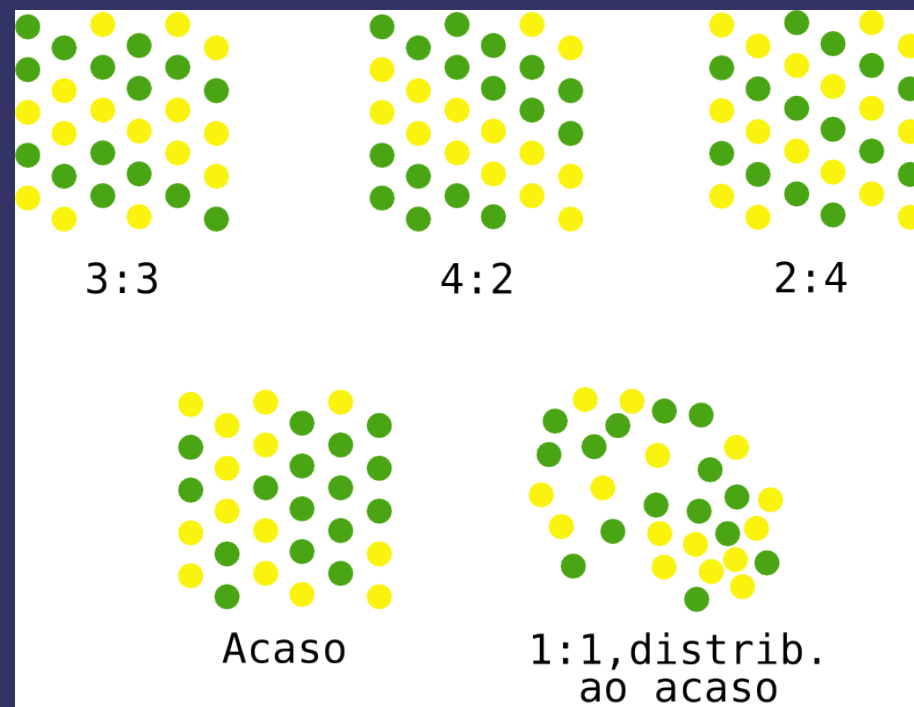
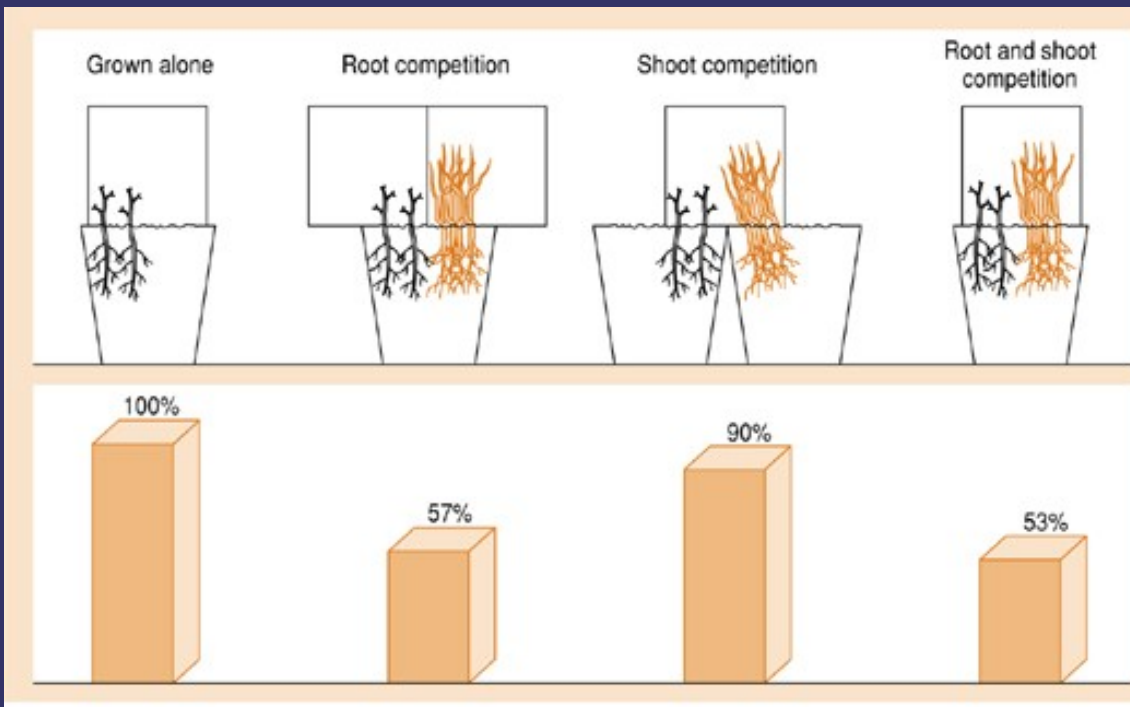


Casuarina, Havaí (Wikipedia)

Capim-gordura, cerrado (L. Coutinho)



EXPERIMENTOS DE COMPETIÇÃO



Harper, 1961



FACILITAÇÃO X COMPETIÇÃO

FACILITAÇÃO: EFEITO BERÇÁRIO



Olneya tesota, uma leguminosa fixadora de Nitrogênio do deserto de Sonora



MODELOS DE DINÂMICA

$$\frac{dN}{dt} = r \cdot N \left(1 - \frac{N}{K}\right)$$

LOTKA- VOLTERRA: UM MODELO FENOMENOLÓGICO

$$\frac{dN}{dt} = r \cdot N \left(1 - \frac{N}{K}\right)$$

$$\frac{dN_1}{dt} = r_1 \cdot N_1 \left(1 - \frac{N_1 + \alpha N_2}{K}\right)$$

MODELOS MECANÍSTICOS: DINÂMICA DE CONSUMO

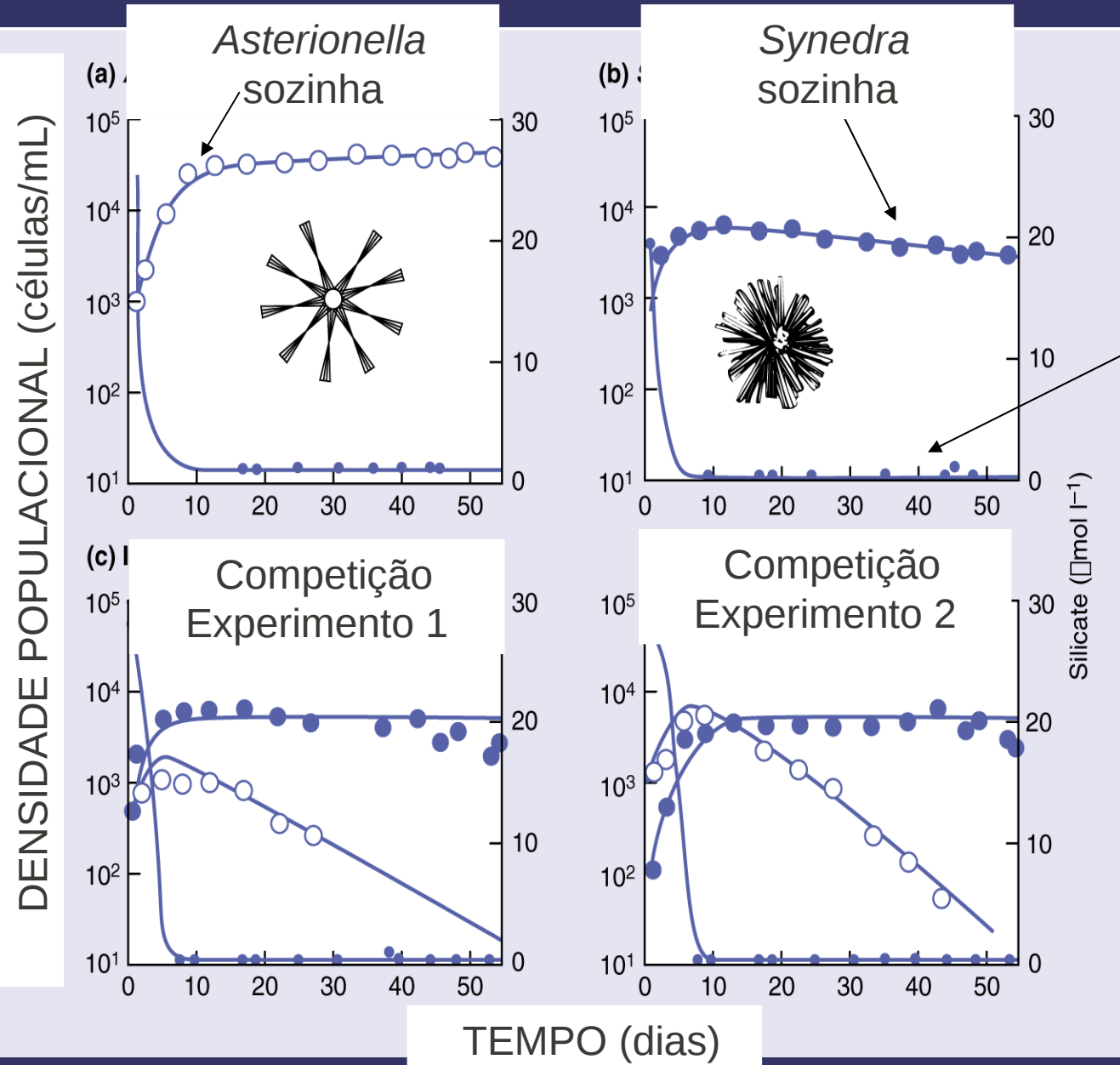


David Tilman



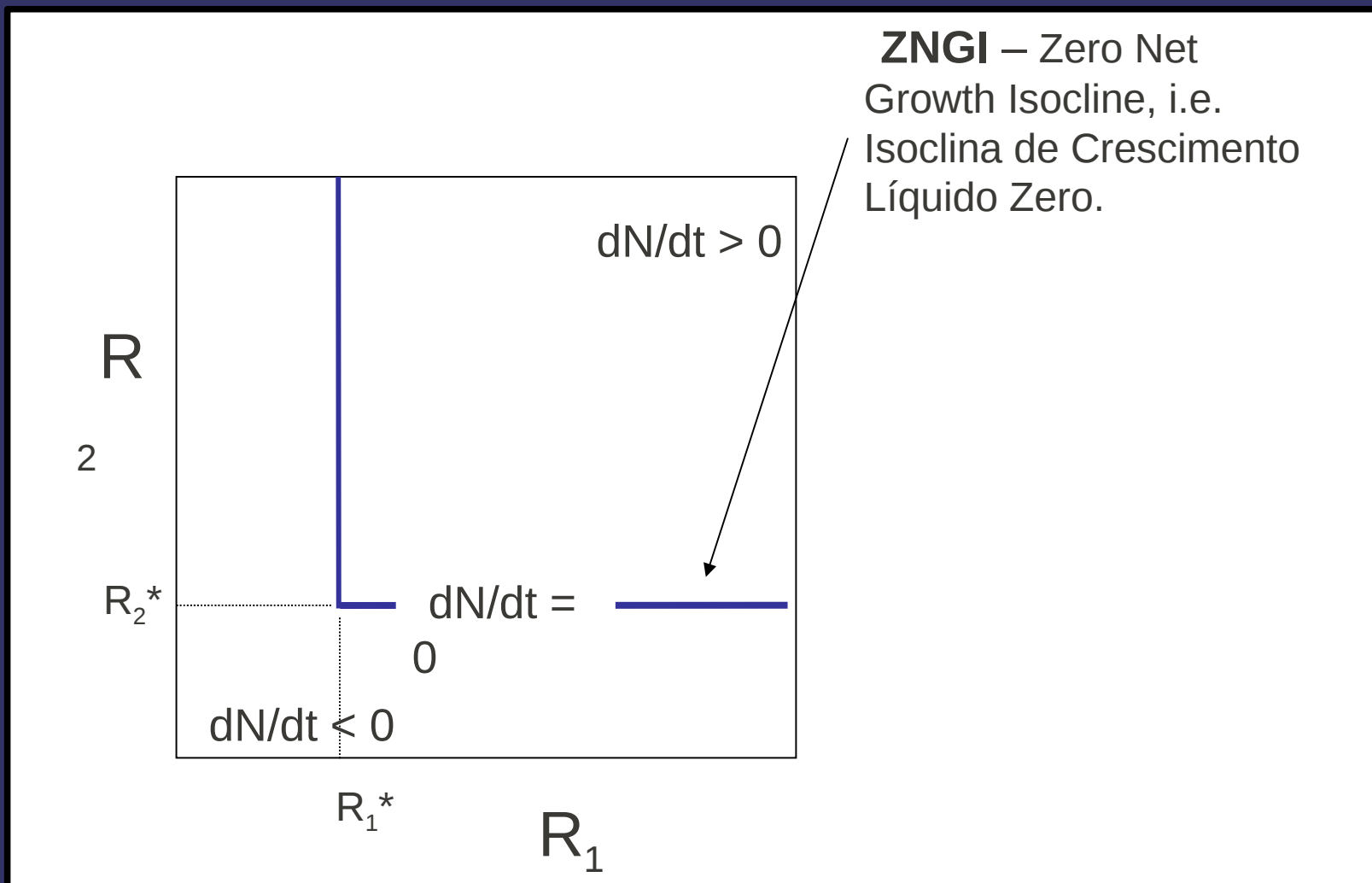
Experimento de Longa duração (LTER)
de Cedar Creek, East Bethel, Minnesota





Concentração de sílica no meio de cultura.

Synedra reduz os níveis de SiO_2 mais do que *Asterionella*.



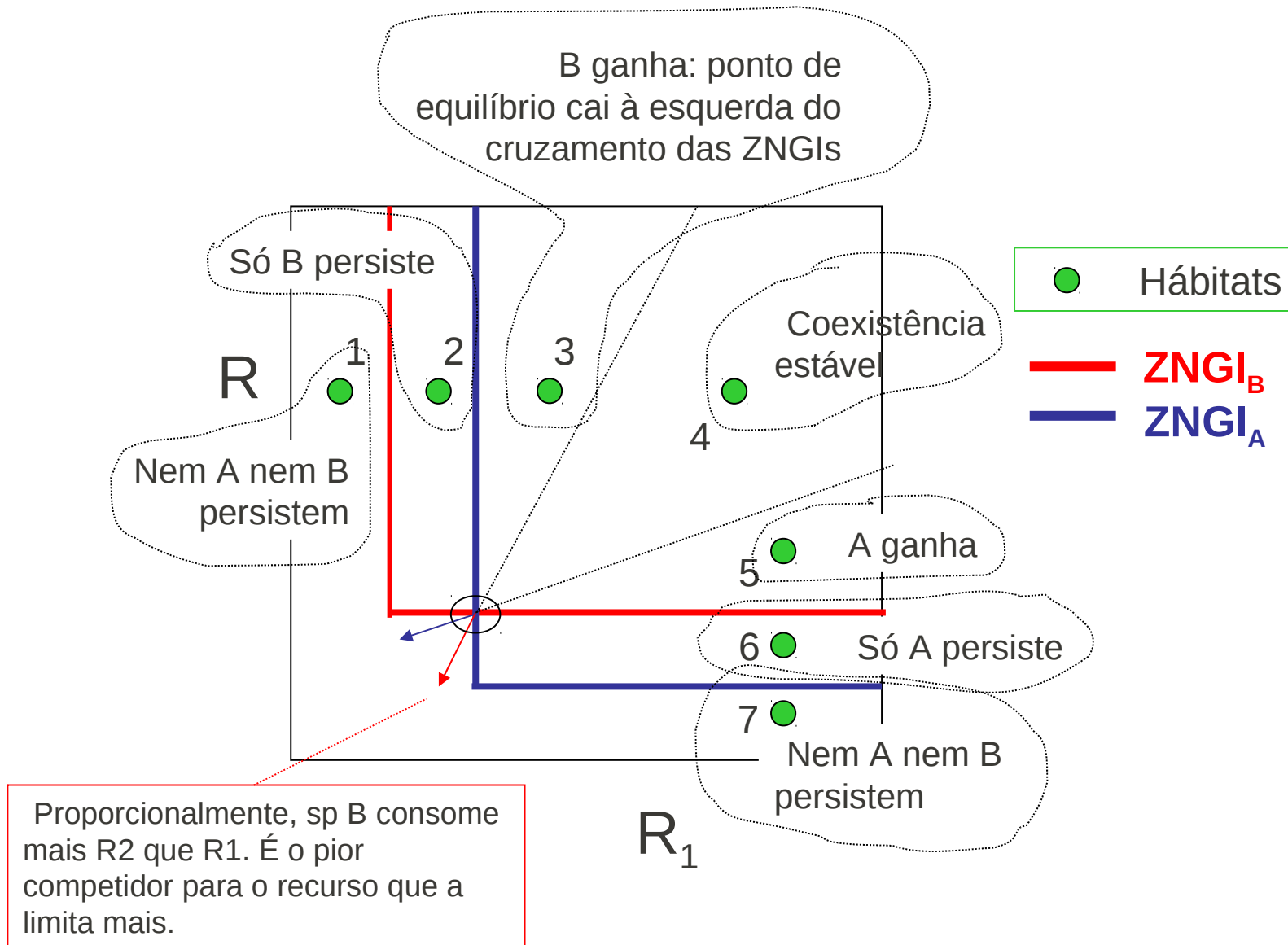
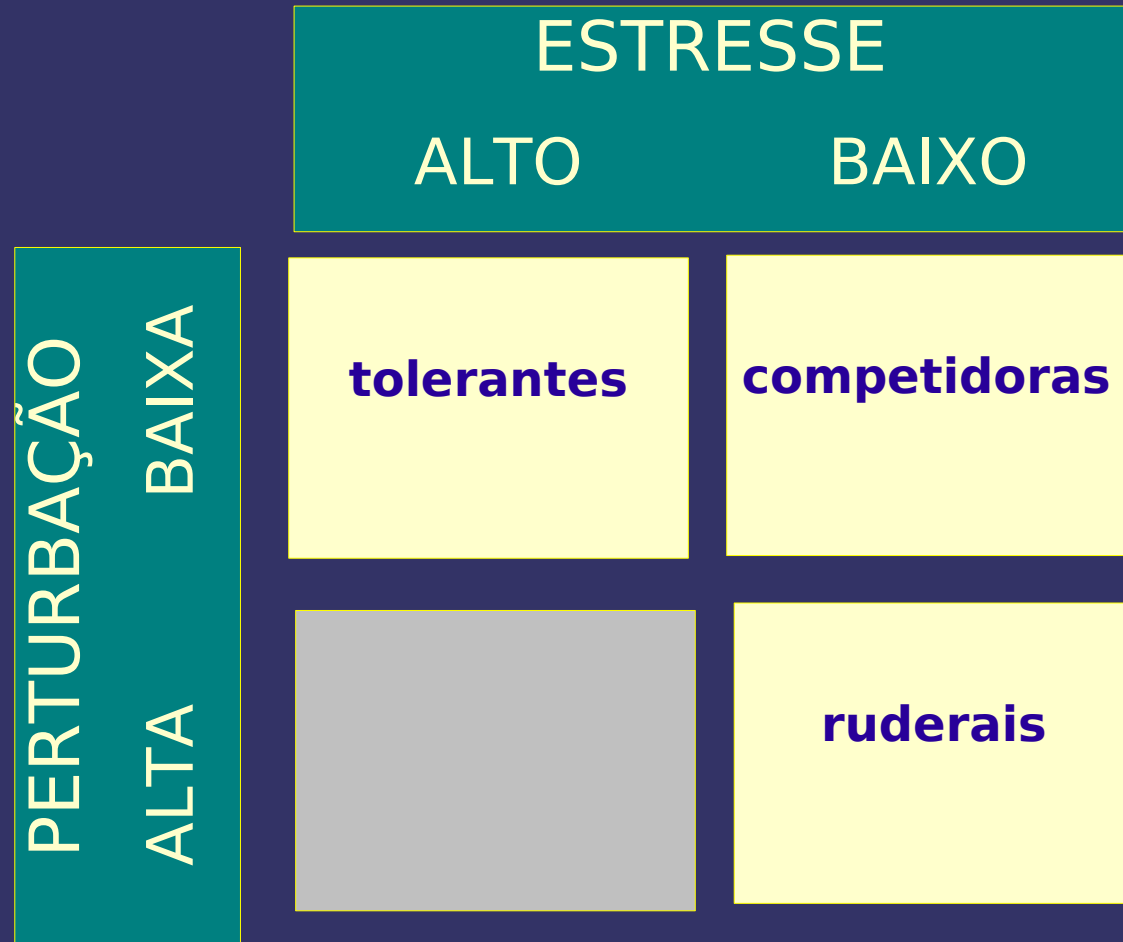


Figura de L. Schiesari

MODELOS MECANÍSTICOS: DEMANDAS CONFLITANTES *



J. Philippe Grime



* *trade offs*



George Evelyn
Hutchinson
1903-1991

Kohn 1971. Limnology and
Oceanography, Vol. 16

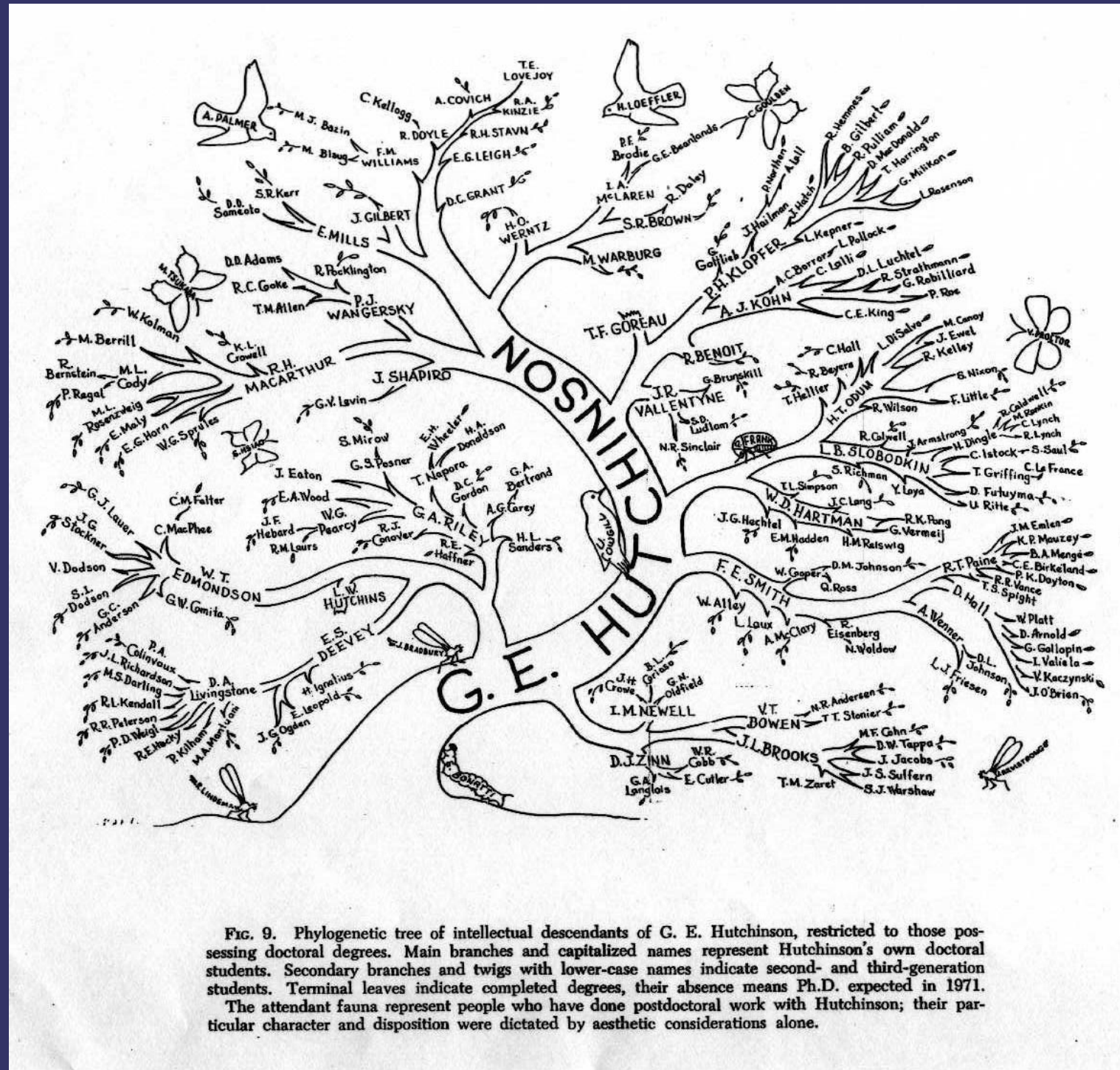
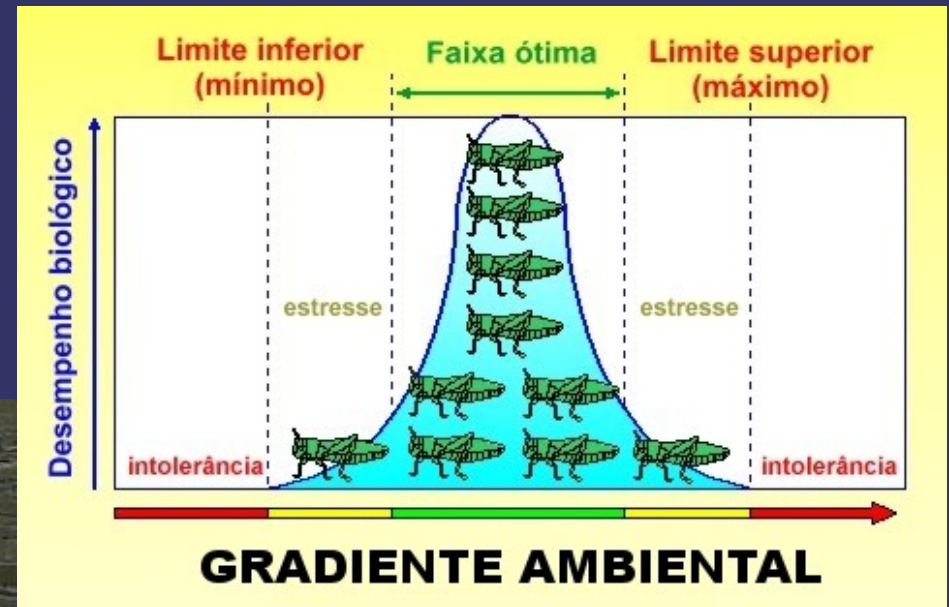
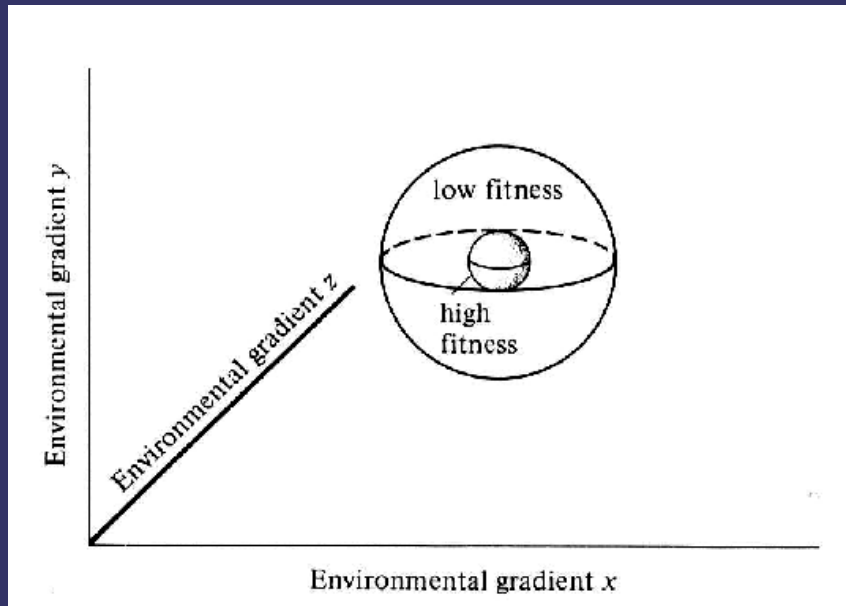


FIG. 9. Phylogenetic tree of intellectual descendants of G. E. Hutchinson, restricted to those possessing doctoral degrees. Main branches and capitalized names represent Hutchinson's own doctoral students. Secondary branches and twigs with lower-case names indicate second- and third-generation students. Terminal leaves indicate completed degrees, their absence means Ph.D. expected in 1971. The attendant fauna represent people who have done postdoctoral work with Hutchinson; their particular character and disposition were dictated by aesthetic considerations alone.

NICHO



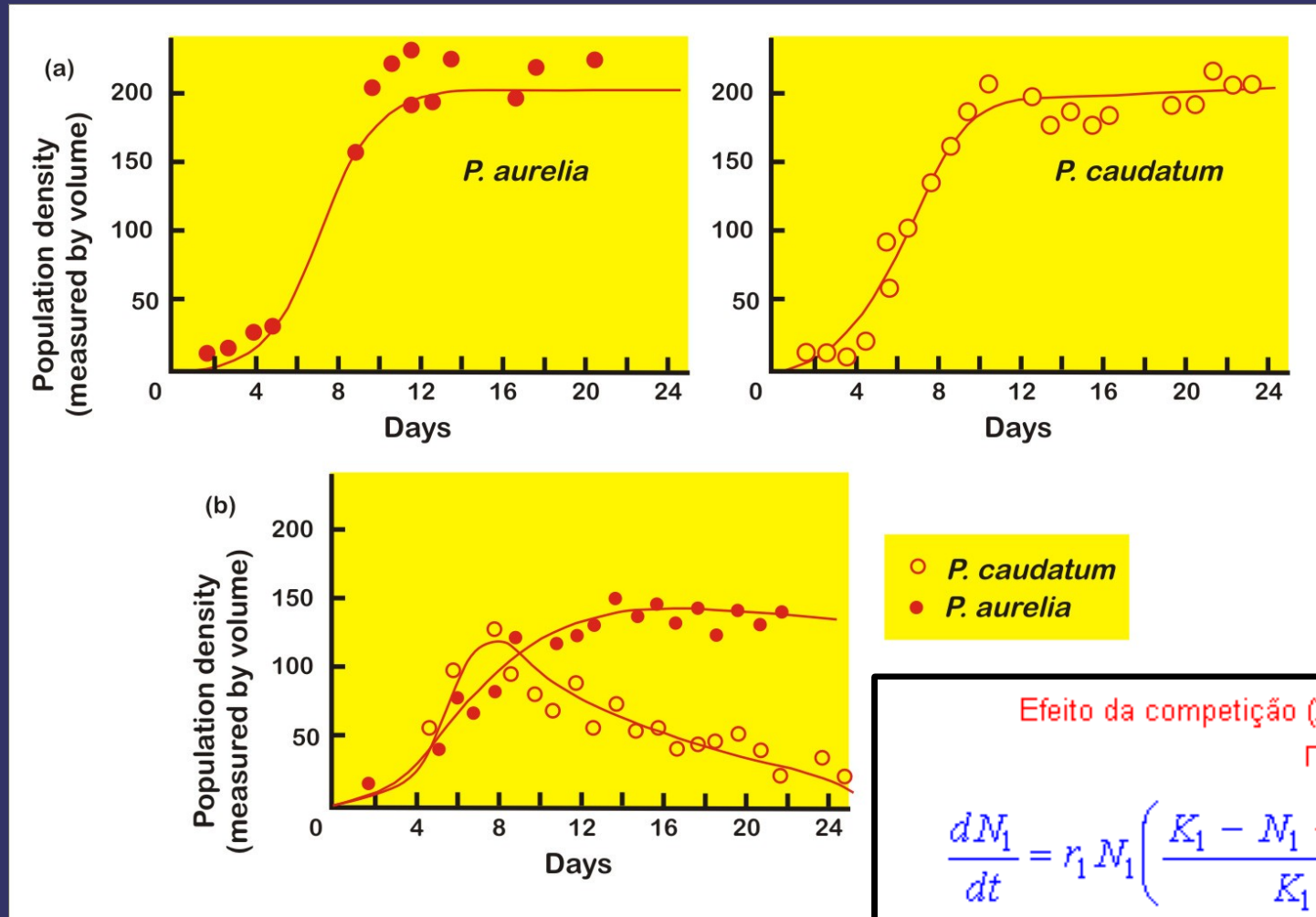
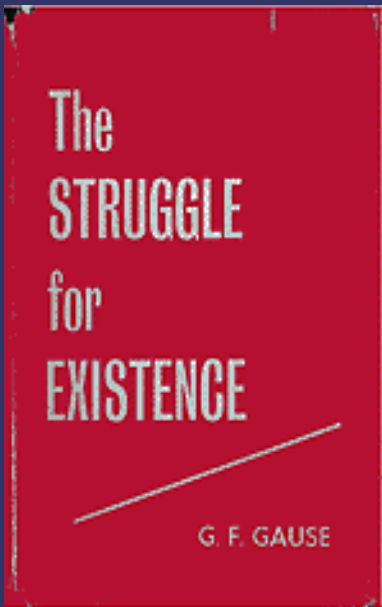
(modificado de Cox *et al.*, 1976)



PRINCÍPIO DA EXCLUSÃO COMPETITIVA



Georgyi Frantsevitch Gause (1910 - 1986)



Efeito da competição (2 em 1)

$$\frac{dN_1}{dt} = r_1 N_1 \left(\frac{K_1 - N_1 - \alpha N_2}{K_1} \right)$$

Modelo logístico (sem competição)

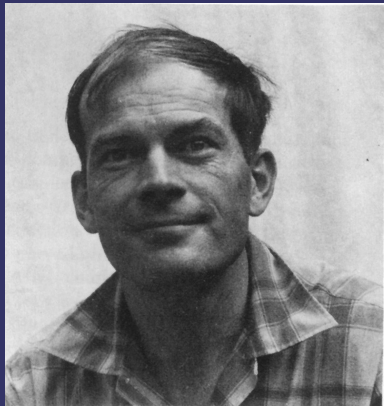
HOMENAGEM A SANTA ROSÁLIA: NASCE UM PARADIGMA



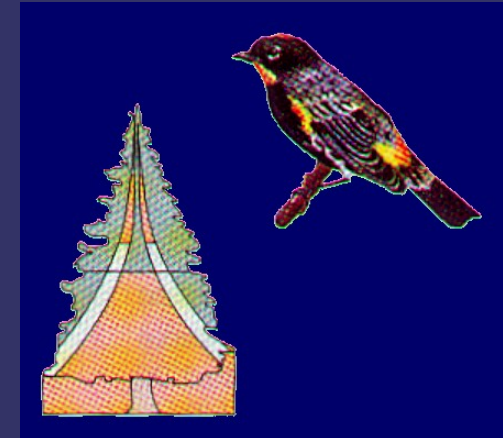
- Competição como principal força estruturadora.
- Diferenças de nicho mediam coexistência.
- Leis e princípios que geram modelos matemáticos.
- Sistemas saturados e em equilíbrio.



MACARTHUR: CONSOLIDAÇÃO DE UM PARADIGMA

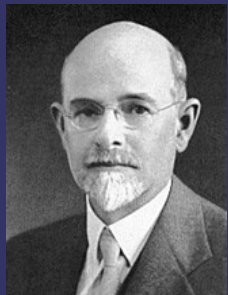


Robert MacArthur
1930-1972



AS CUNHAS DE DARWIN

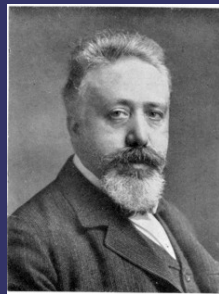
"Nature may be compared to a surface covered with ten-thousand sharp wedges, many of the same shape & many of different shapes representing different species, all packed closely together & all driven in by incessant blows: the blows being far severer at one time than at another; sometimes a wedge of one form & sometimes another being struck; the one driven deeply in forcing out others; with the jar and shock often transmitted very far to other wedges in many lines of direction: beneath the surface we may suppose that there lies a hard layer, fluctuating in its level, & which may represent the minimum amount of food required by each living being, & which layer will be impenetrable by the sharpest wedge."



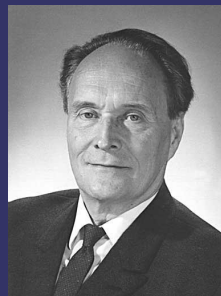
Grinnell



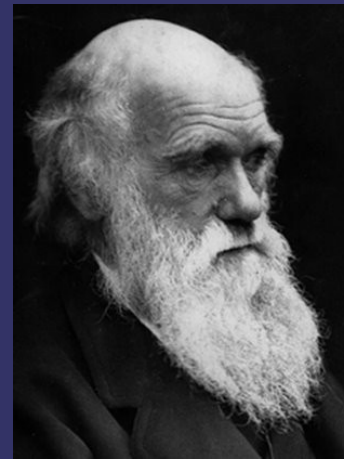
Lotka



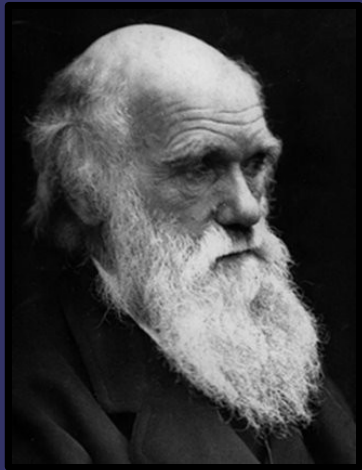
Volterra



Gause



Sistema Ecológicos estão em Equilíbrio?



*... be compared to a surface covered with ten-thousand sharp
... of the same shape & many of different shapes representing
... cies, all packed closely together & **all driven in***

***by incessant blows: the blows being
far severer at one time than at***

***another;** sometimes a wedge of one form & sometimes another
being struck; the one driven deeply in forcing out others; with the jar and
shock often transmitted very far to other wedges in many lines of
direction ...*



Perturbação: Nichos de Regeneração ...

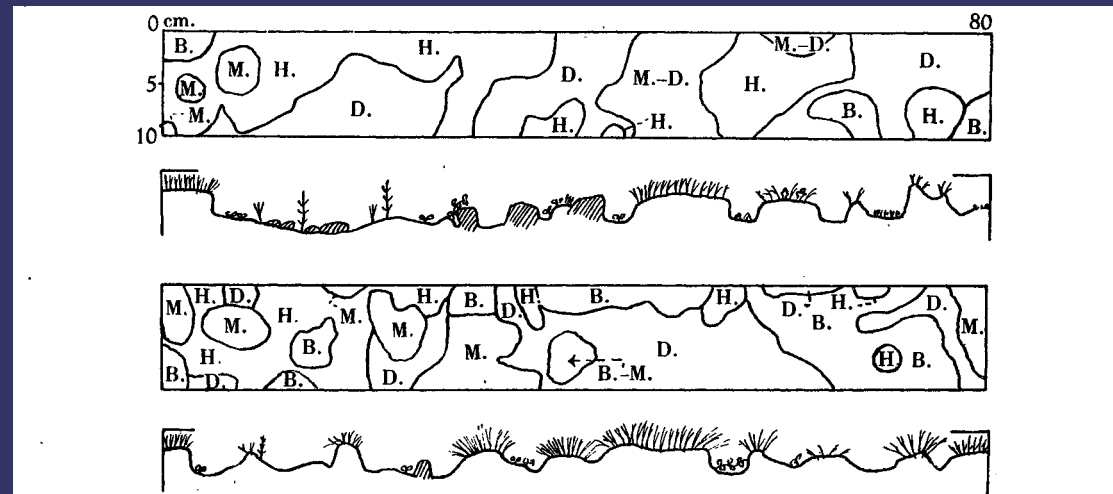
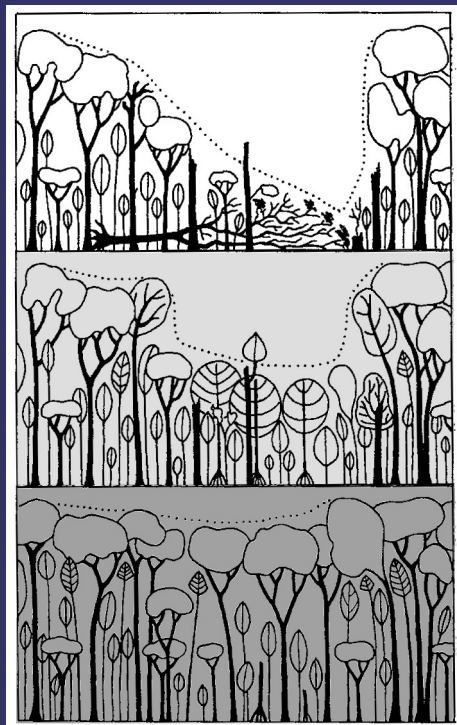
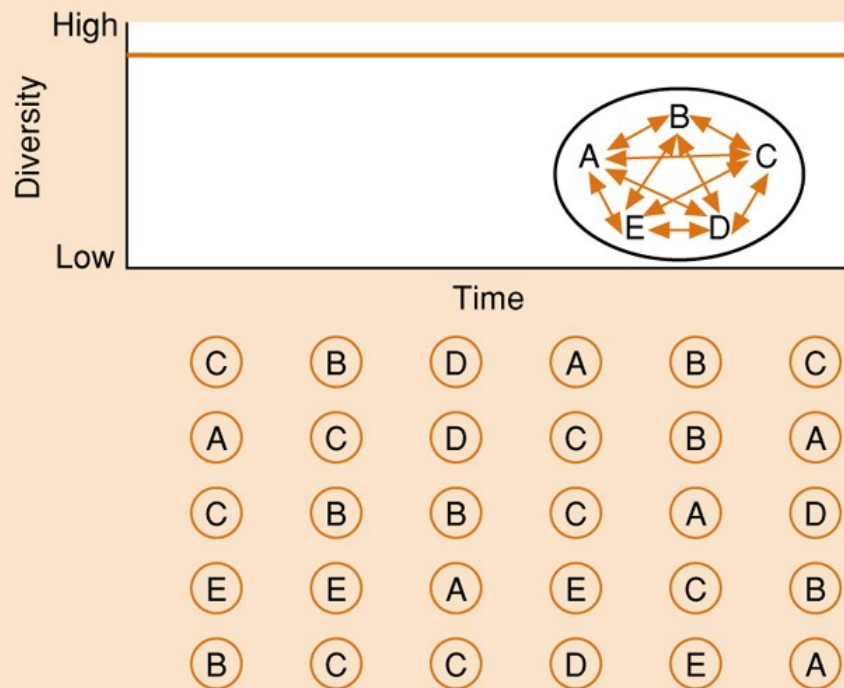


Fig. 5. The relative size and spatial relations of the phases in a plot of 160 x 10 cm, in Grassland A. The relation between the phases and the microtopography is seen in the profile taken along the upper edge of the plot.

Watt A S. Pattern and process in the plant community. I. Ecology 35:1-22, 1947.

... ou dinâmicas de não-equilíbrio?

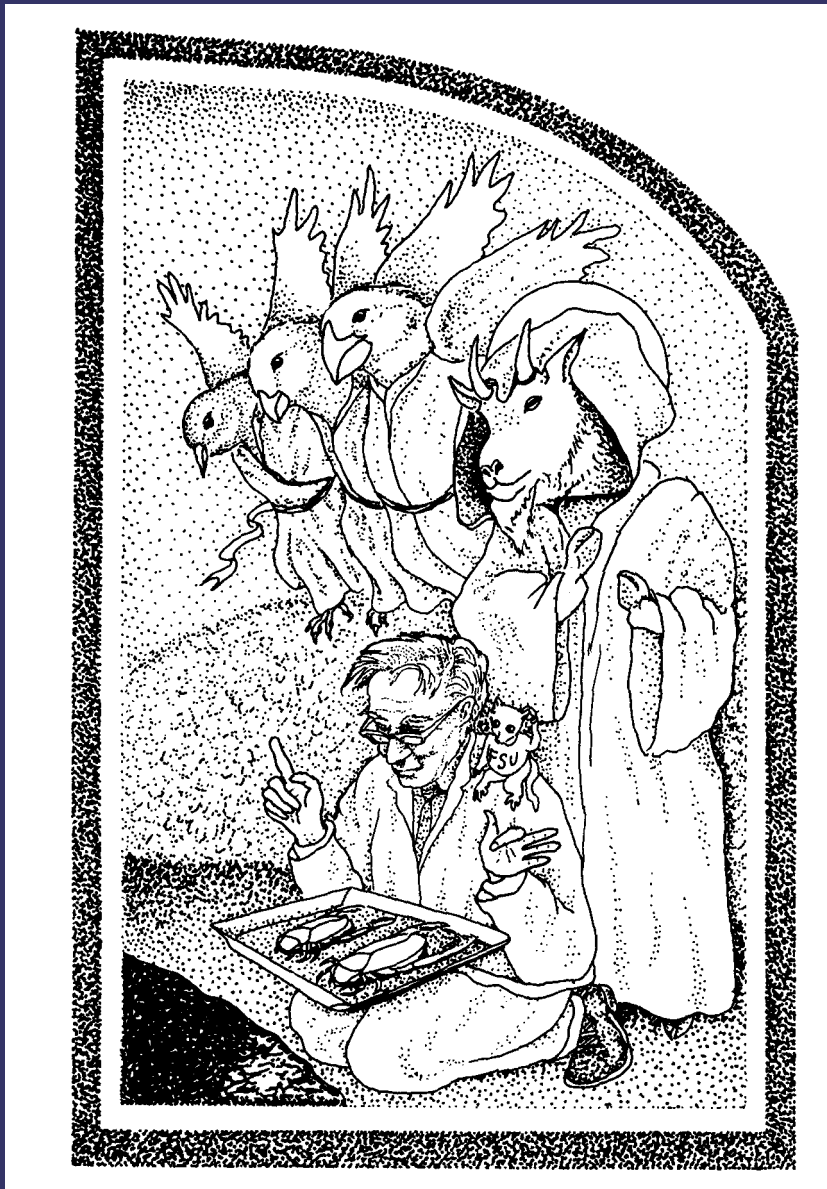


"Tropical forests and reefs are subject to severe disturbances often enough that equilibrium may never be attained."



Joseph Connell

Science, 1978



Santa Rosália era uma
Cabra?



???

