Pau
VILLE DE
PYRÉNÉES OCÉANES

pierre.bricage@univ-pau.fr

SYSTÈMES VIVANTS
Quel contrat sociétal ?

Pierre BRICAGE

COMPLEX
- Management Systems
- Networks
- Social Systems
- Engineered Systems
- Biological and Ecological Systems

UPPA
UNIVERSITÉ DE PAU ET DES PAYS DE L'ADOUR
FRANCE, EUROPE
univ-pau.fr
Collège de LESCAR 1549,
Université Royale de BÉARN 1583
sciences, médecine

UTLA

SICHUAN UNIVERSITY 1896

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Advancing Technology for Humanity

ALBA | PELLEAS | MCX 20 | AFSCET | ISSS | emcsr | UES - EUS | WOSC | IASCYS

UTLA abc biologie

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une fourmi ouvrière isolée

"d'un point de vue comportemental"
c'est un animal très peu "sophistiqué"
100 soldats placés ensemble sur une surface plane
vont déambuler en cercles, dans tous les sens,
jusqu'à en mourir d'épuisement

"armée" de fourmis
migrant à l'unisson

L'INVARIANCE DE JAUGE DES SYSTÈMES VIVANTS

SURVIVRE

La MOBILISATION MÉTABOLISME
de la MATIÈRE et de l'ÉNERGIE

L'INVARIANCE DE JAUGE DES SYSTÈMES VIVANTS

SURVIVRE

La MOBILISATION MÉTABOLISME
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La CROISSANCE
en masse MASSE

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La CROISSANCE en masse — MASSE

La RÉPONSE à des STIMULATIONS — RÉACTION

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L'ORGANISATION interne dans l'espace et dans le temps — ESPACE TEMPS

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La CROISSANCE en masse — MASSE

La RÉPONSE à des STIMULATIONS — RÉACTION

L'ORGANISATION interne dans l'espace et dans le temps — ESPACE TEMPS

L'INTÉGRATION exteme

L'INVARIANCE DE JAUGE DES SYSTÈMES VIVANTS

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La CROISSANCE
en masse MASSE

La RÉPONSE à RÉACTION
des STIMULATIONS

L'ORGANISATION interne
dans l'espace ESPACE
et dans le temps TEMPS

L'INTÉGRATION exteme

Le MOUVEMENT

L'INVARIANCE DE JAUGE DES SYSTÈMES VIVANTS

SURVIVRE

La MOBILISATION de la MATIÈRE et de l'ÉNERGIE — MÉTABOLISME

La CROISSANCE en masse — MASSE

La RÉPONSE à des STIMULATIONS — RÉACTION

L'ORGANISATION interne dans l'espace et dans le temps — ESPACE TEMPS

L'INTÉGRATION exteme

Le MOUVEMENT

pour **SE SURVIVRE**

La REPRODUCTION

L'INVARIANCE DE JAUGE
DES SYSTÈMES VIVANTS

SURVIVRE

La MOBILISATION MÉTABOLISME
de la MATIÈRE et de l'ÉNERGIE

La CROISSANCE
en masse MASSE

La RÉPONSE à RÉACTION
des STIMULATIONS

L'ORGANISATION interne
dans l'espace ESPACE
et dans le temps TEMPS

L'INTÉGRATION exteme

Le MOUVEMENT

pour **SE SURVIVRE**

La REPRODUCTION

La CROISSANCE
en nombre NOMBRE

L'INVARIANCE DE JAUGE
DES SYSTÈMES VIVANTS

SURVIVRE

La MOBILISATION de la MATIÈRE et de l'ÉNERGIE — MÉTABOLISME

La CROISSANCE en masse — MASSE

La RÉPONSE à des STIMULATIONS — RÉACTION

L'ORGANISATION interne dans l'espace et dans le temps — ESPACE TEMPS

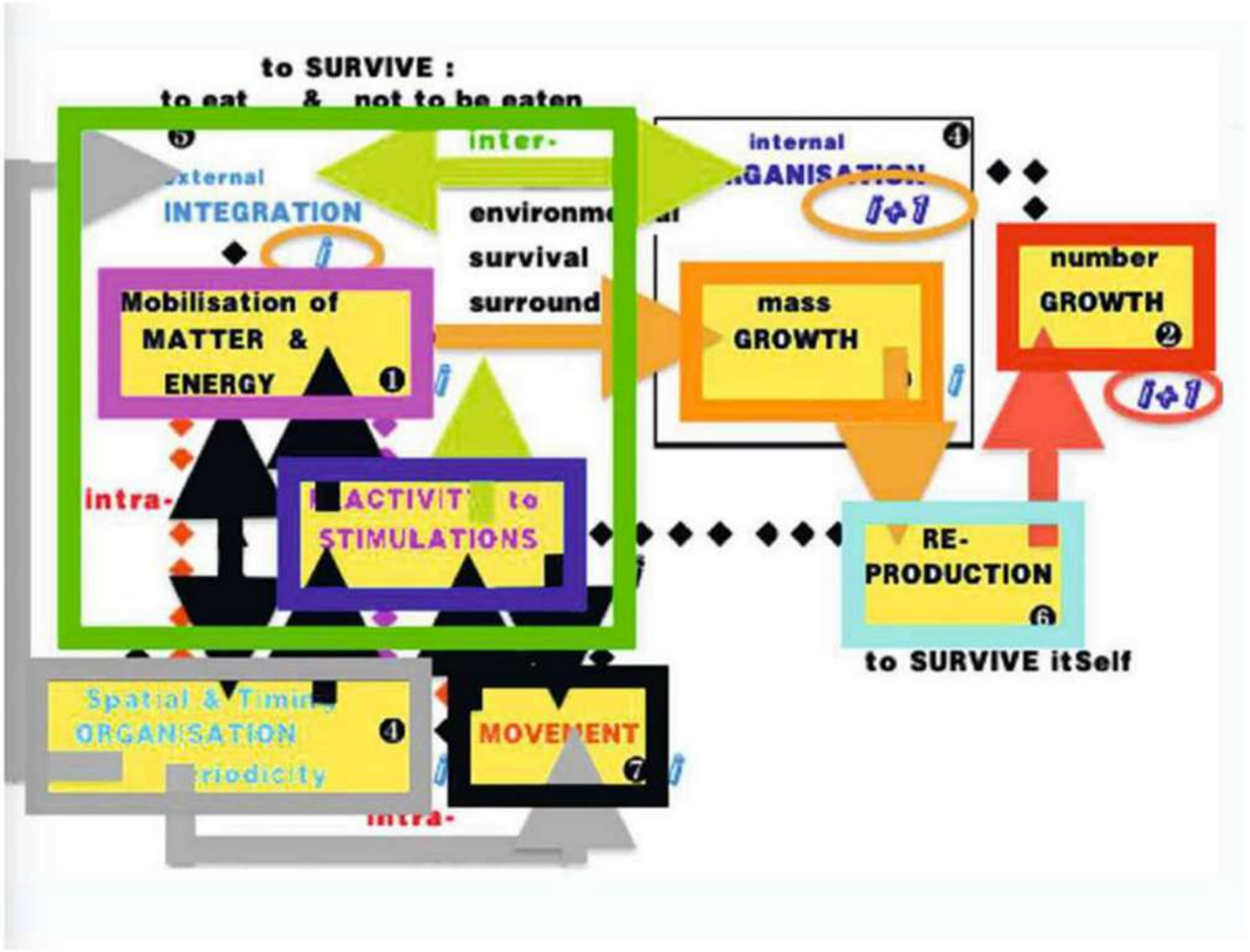
L'INTÉGRATION externe

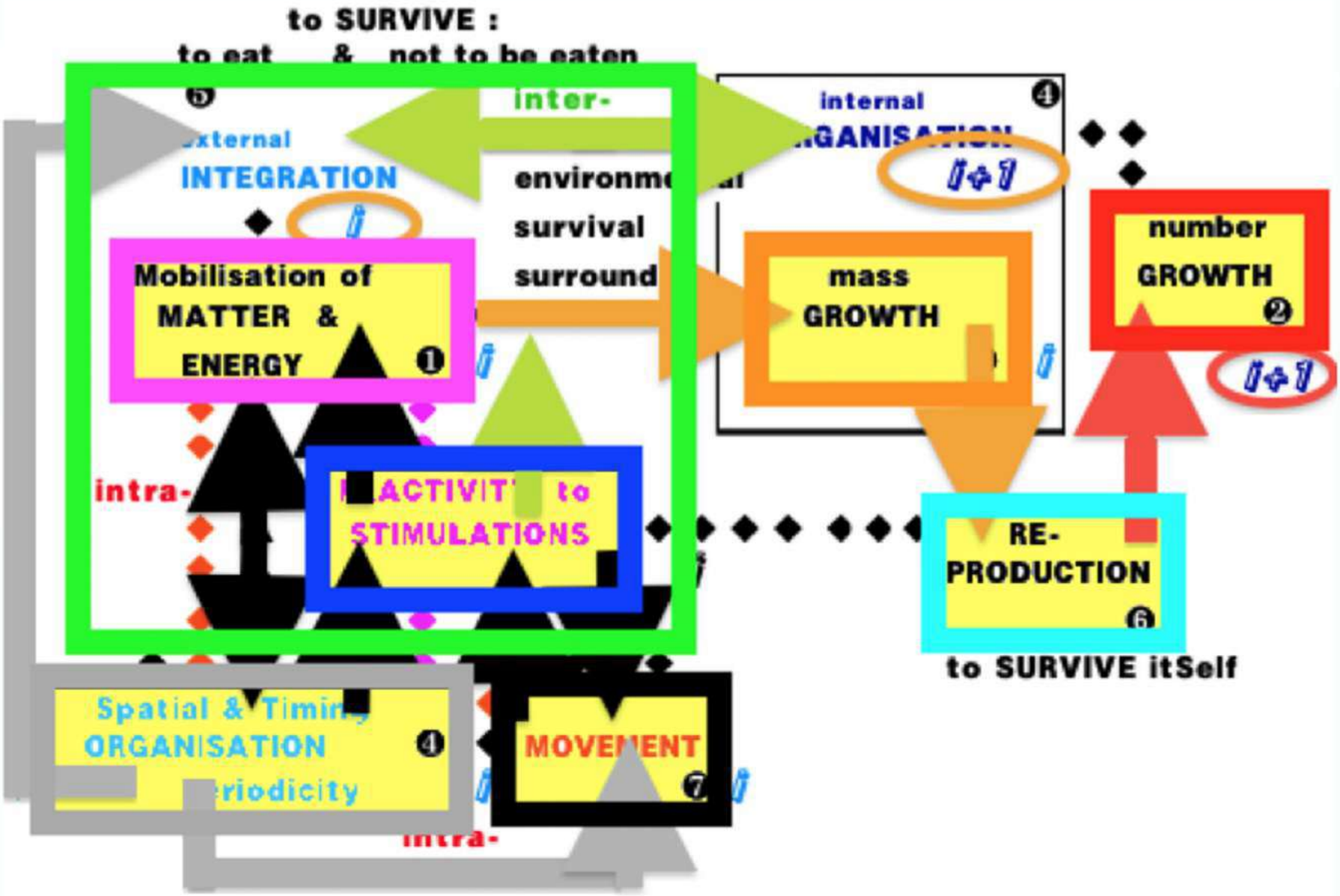
Le MOUVEMENT

pour **SE SURVIVRE**

La REPRODUCTION

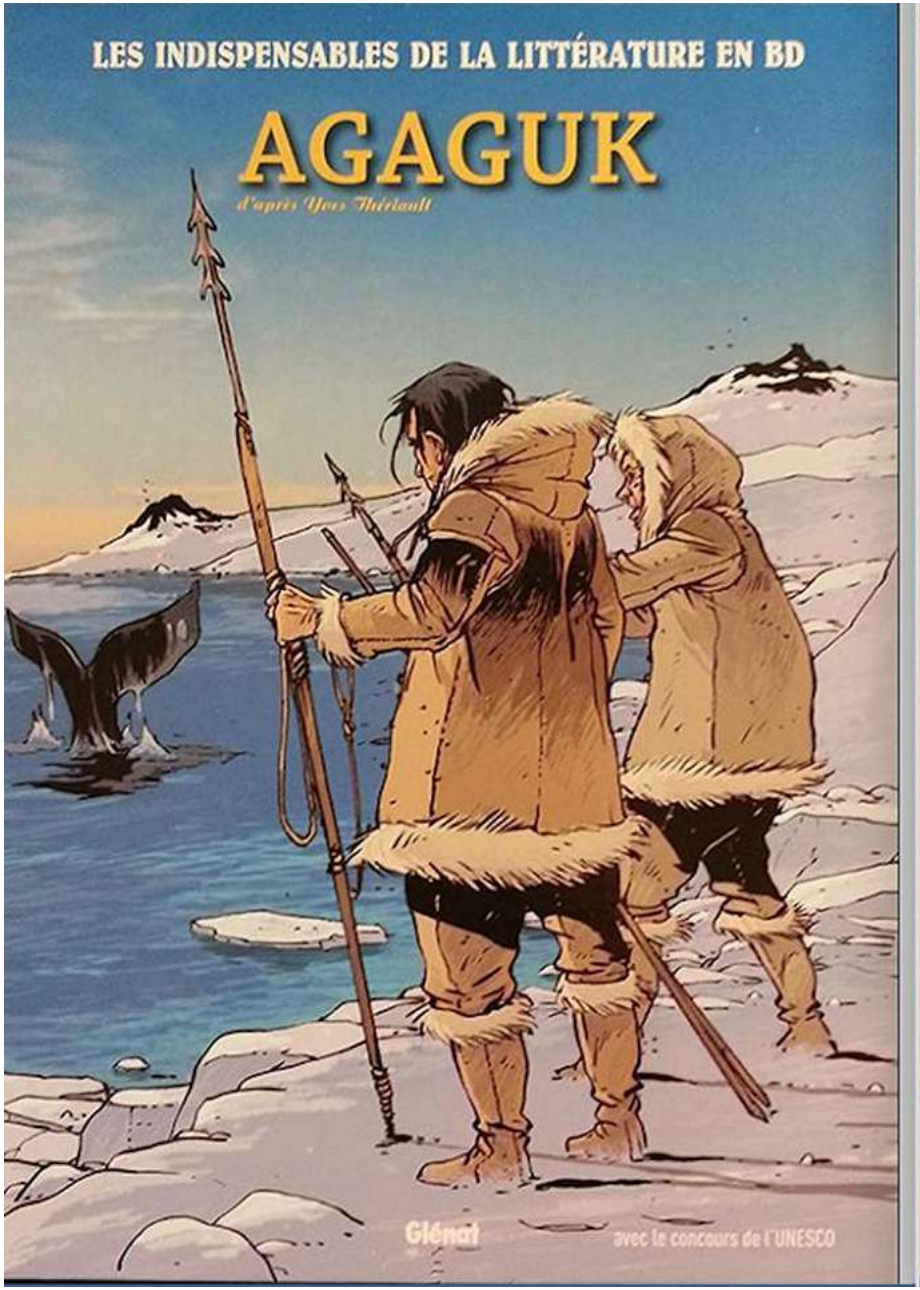
La CROISSANCE en nombre — NOMBRE

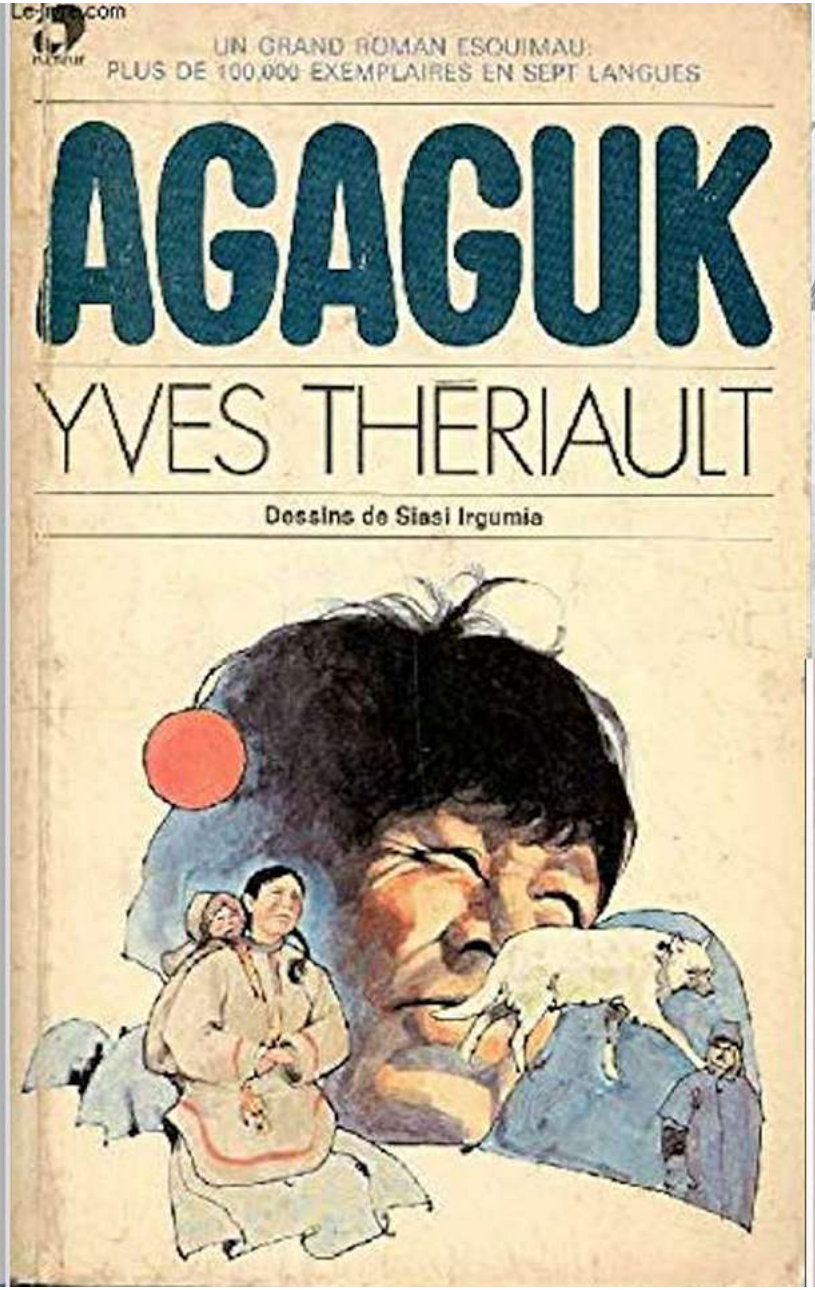


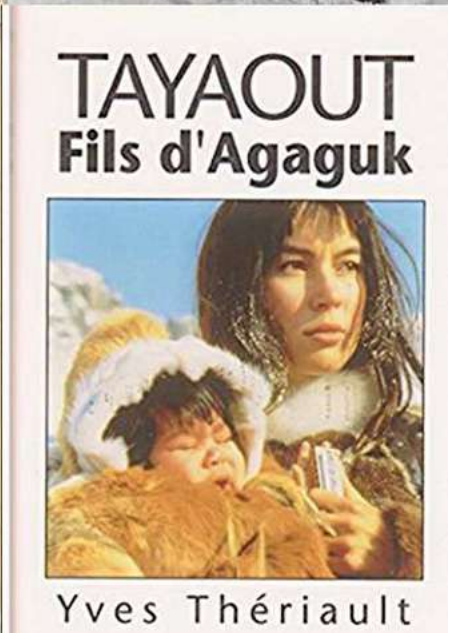

to SURVIVE :
to eat & not to be eaten
external
INTEGRATION
inter-
environme
survival
surround
internal
Mobilisation of
MATTER &
ENERGY
mass
GROWTH
number
GROWTH
intra-
to
STIMULATIONS
RE-
PRODUCTION
to SURVIVE itSelf
Spatial &
ORGANISATION
MOVEMENT
intra-

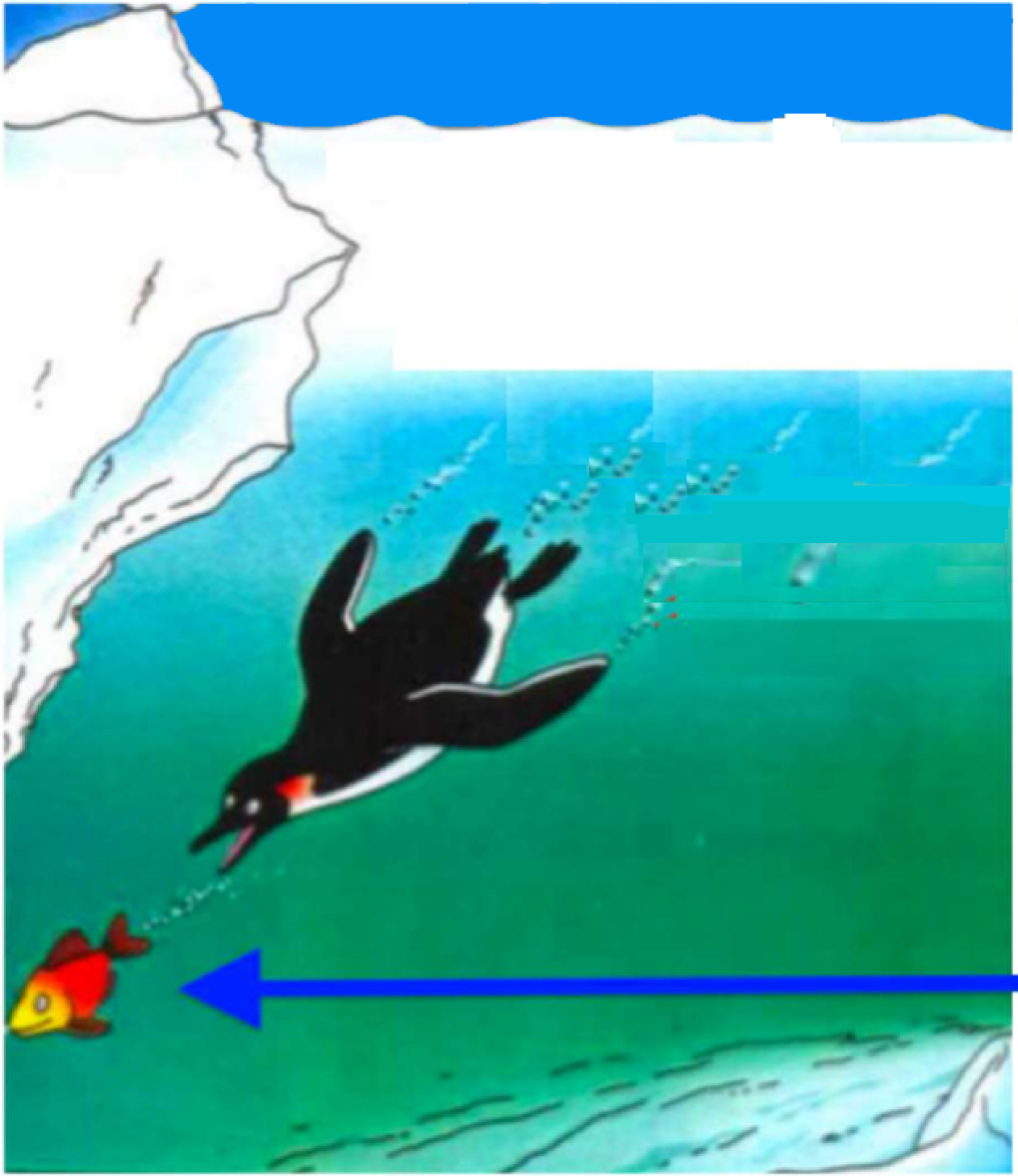
Ants have group-level personalities,

which affects their success at collecting food and competing with other colonies.


LES INDISPENSABLES DE LA LITTÉRATURE EN BD
AGAGUK
d'après Yves Thériault
Glénat
avec le concours de l'UNESCO

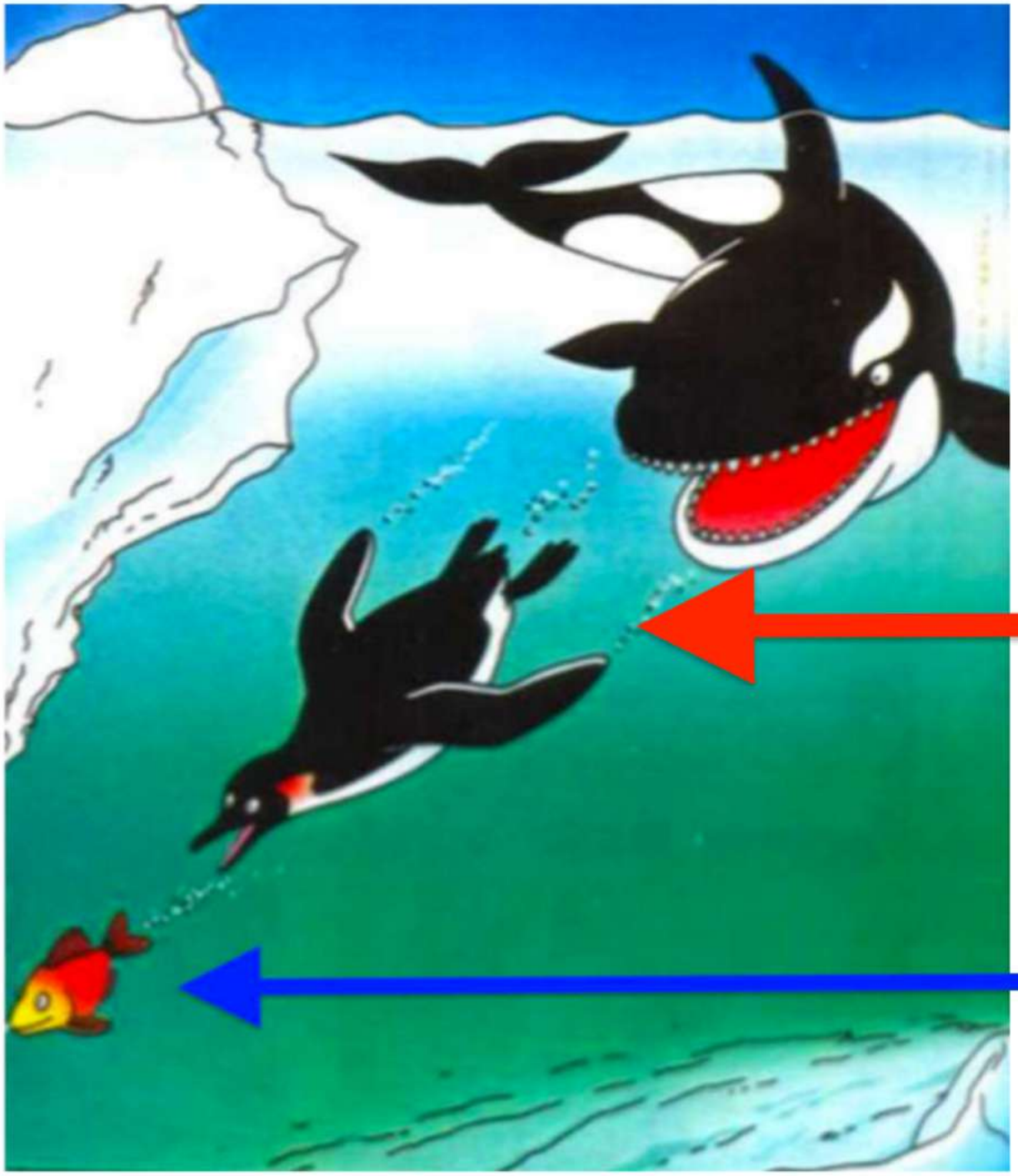

UN GRAND ROMAN ESQUIMAU:
PLUS DE 100,000 EXEMPLAIRES EN SEPT LANGUES
AGAGUK
YVES THÉRIAULT
Dessins de Siasi Irgumie


TAYAOUT
Fils d'Agaguk
Yves Thériault



SURVIVRE C'EST

MANGER



SURVIVRE C'EST

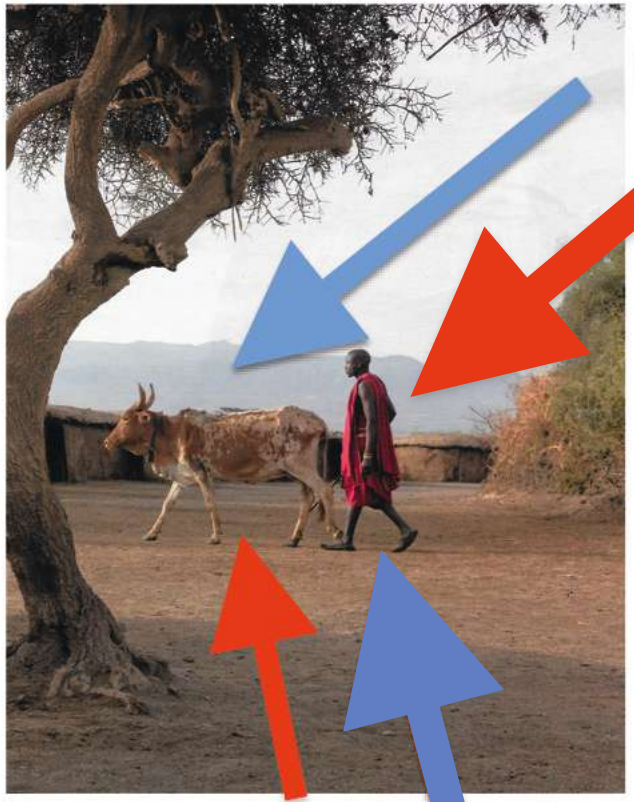
NE PAS

ÊTRE MANGÉ

ET

MANGER


wzw314.blog.163.com



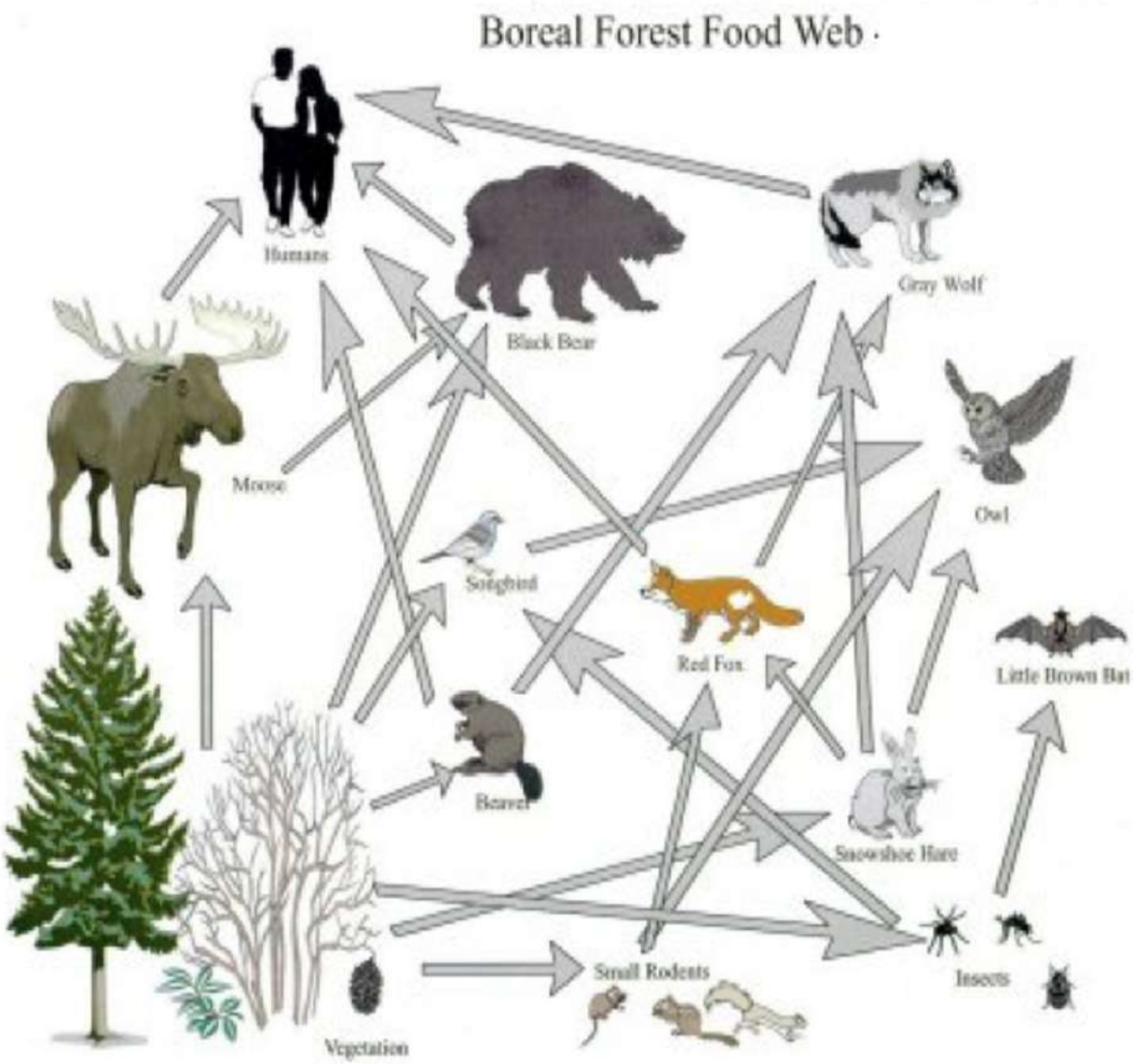
FOR THE ONE TO SURVIVE

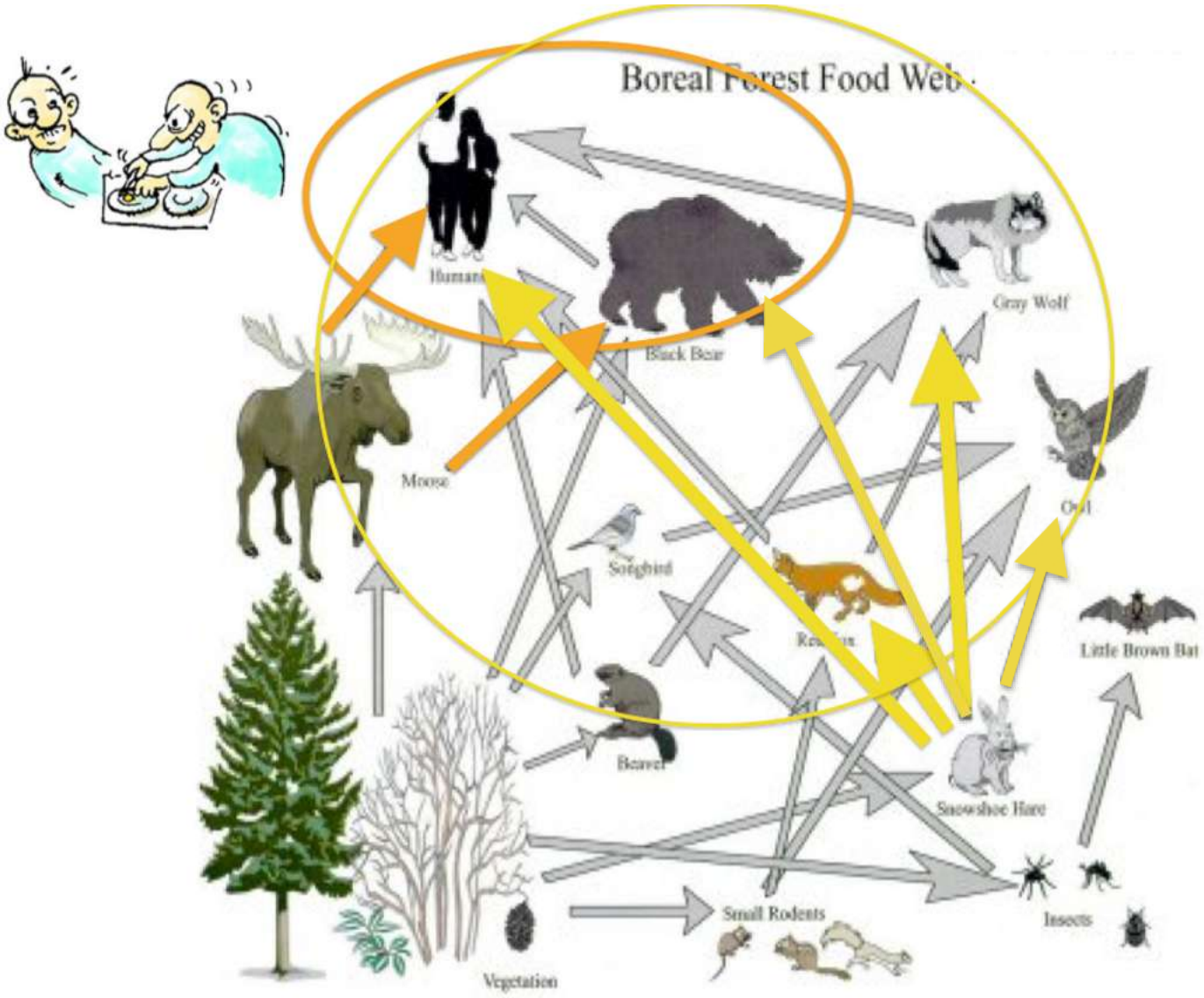
THE OTHER
MUST SURVIVE FIRST

FOR THE ONES TO SURVIVE

THE OTHER MUST SURVIVE FIRST

Evolutionary systems, theories of living systems and theories of social systems


Boreal Forest Food Web
Humans
Black Bear
Gray Wolf
Moose
Owl
Songbird
Red Fox
Little Brown Bat
Beaver
Snowshoe Hare
Small Rodents
Insects
Vegetation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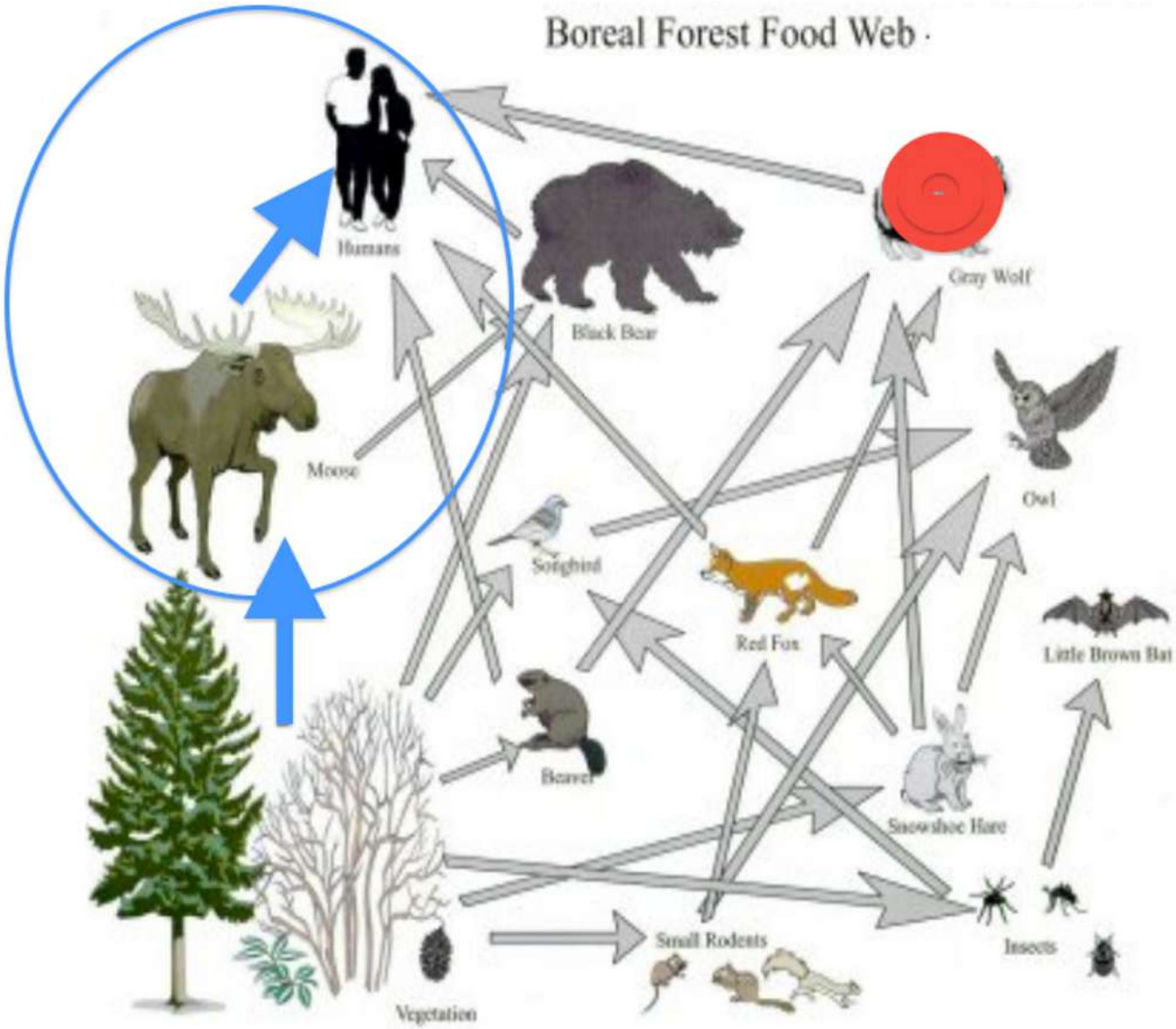
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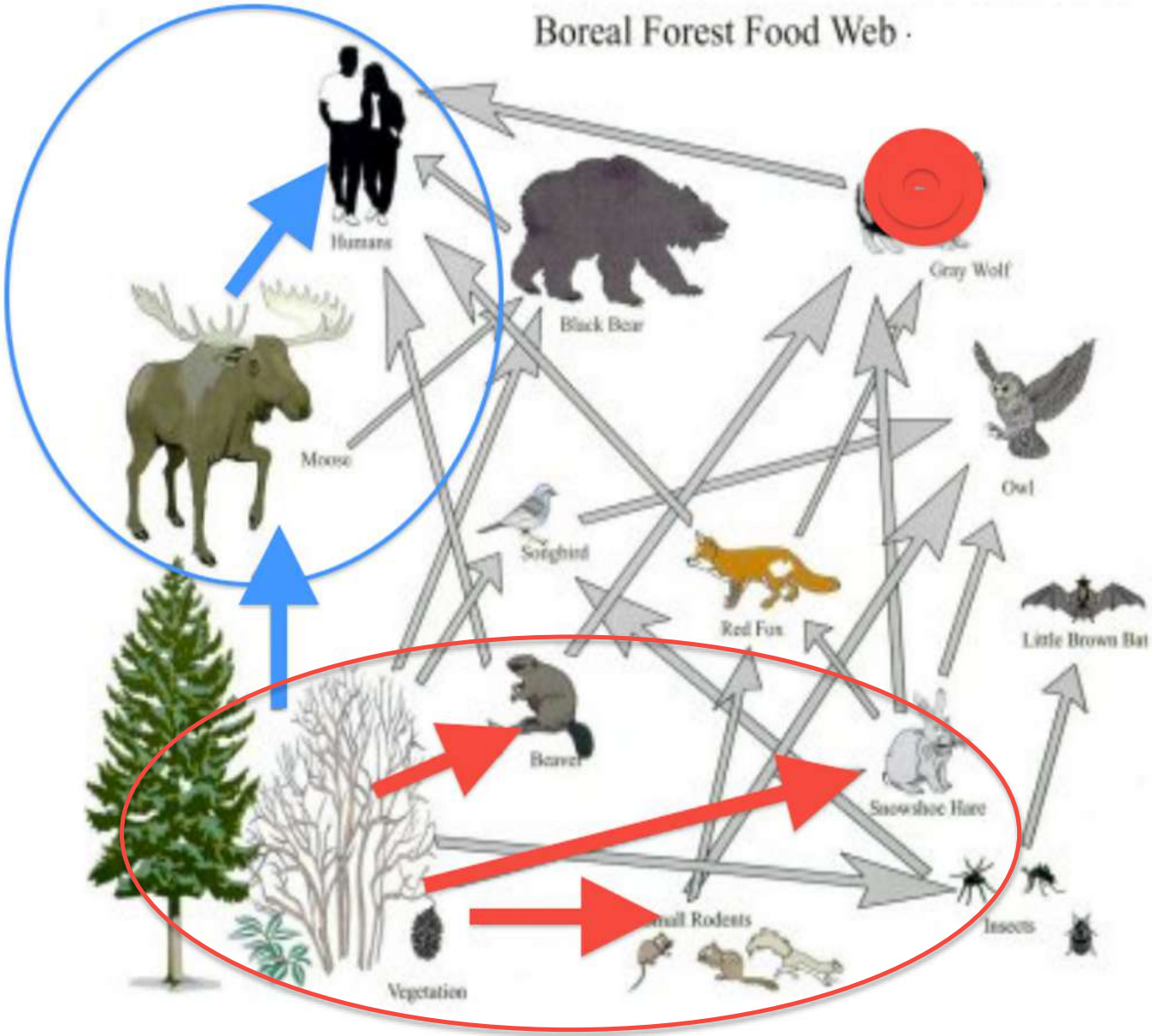
Insects
Vegetation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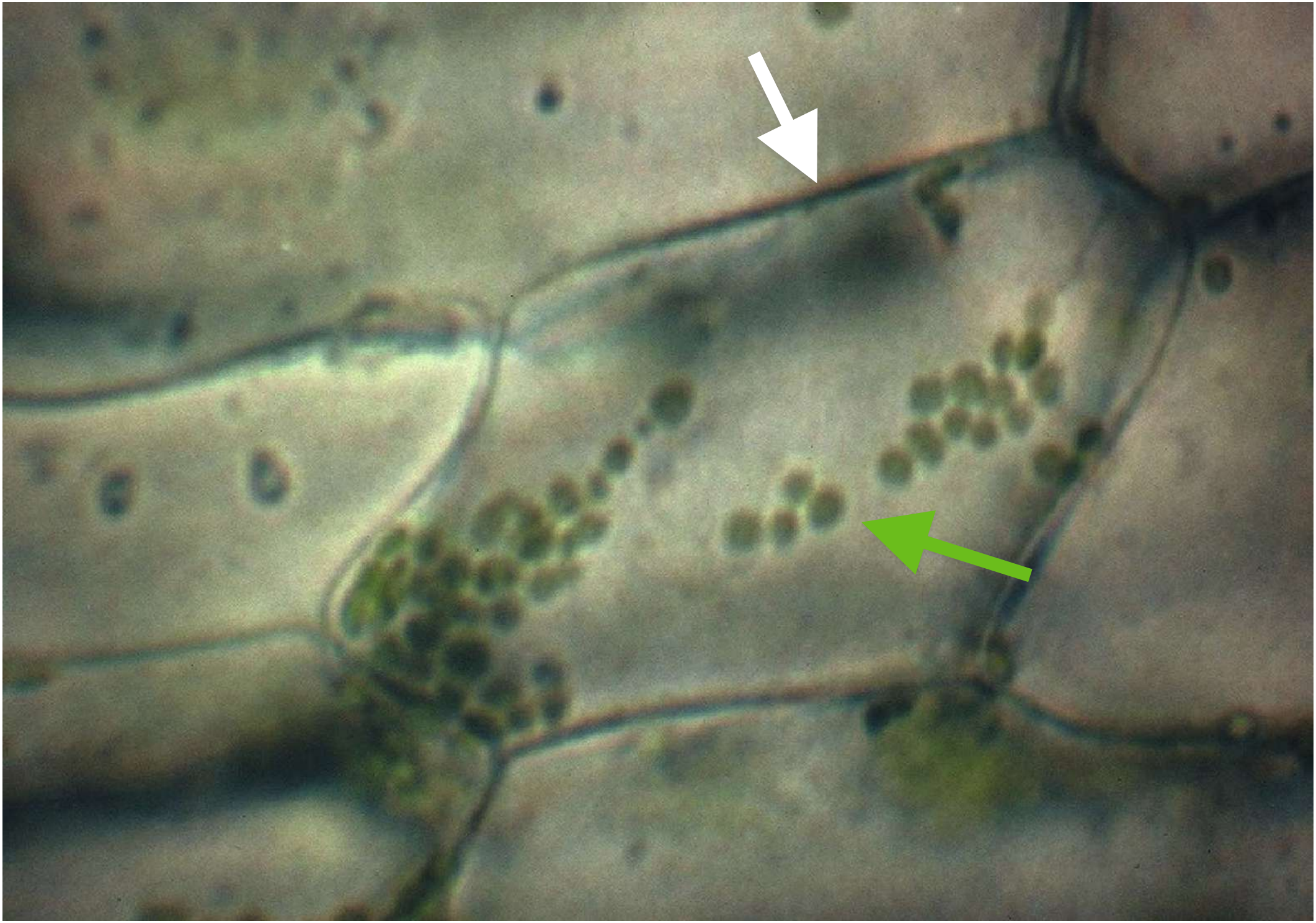
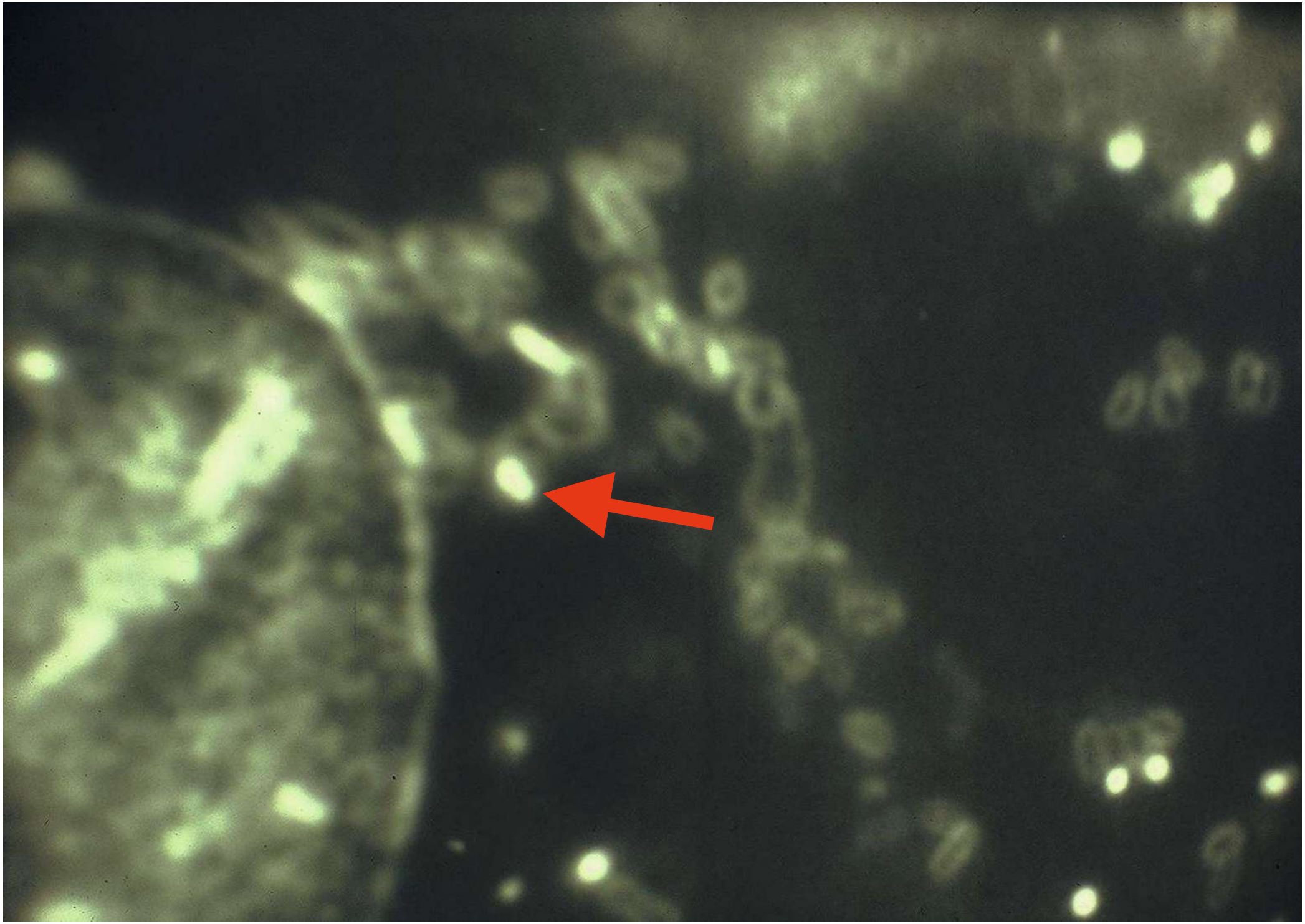
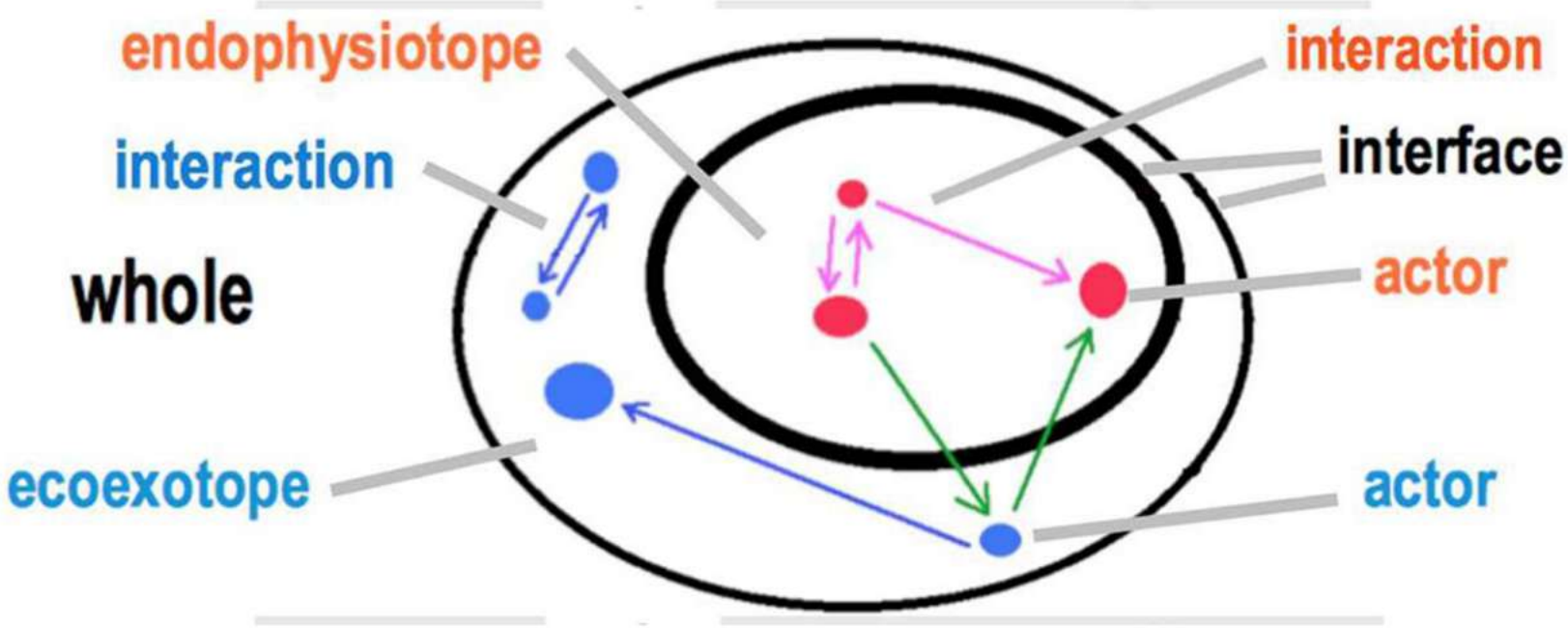
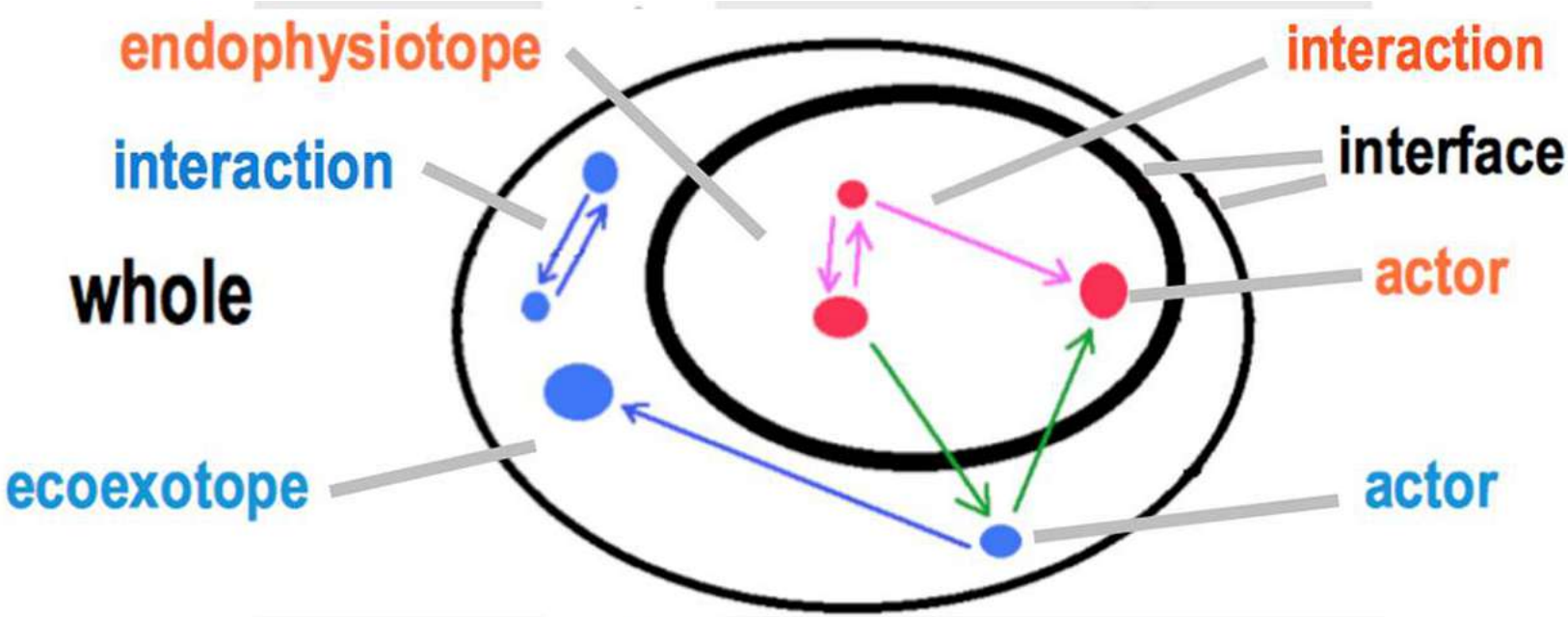
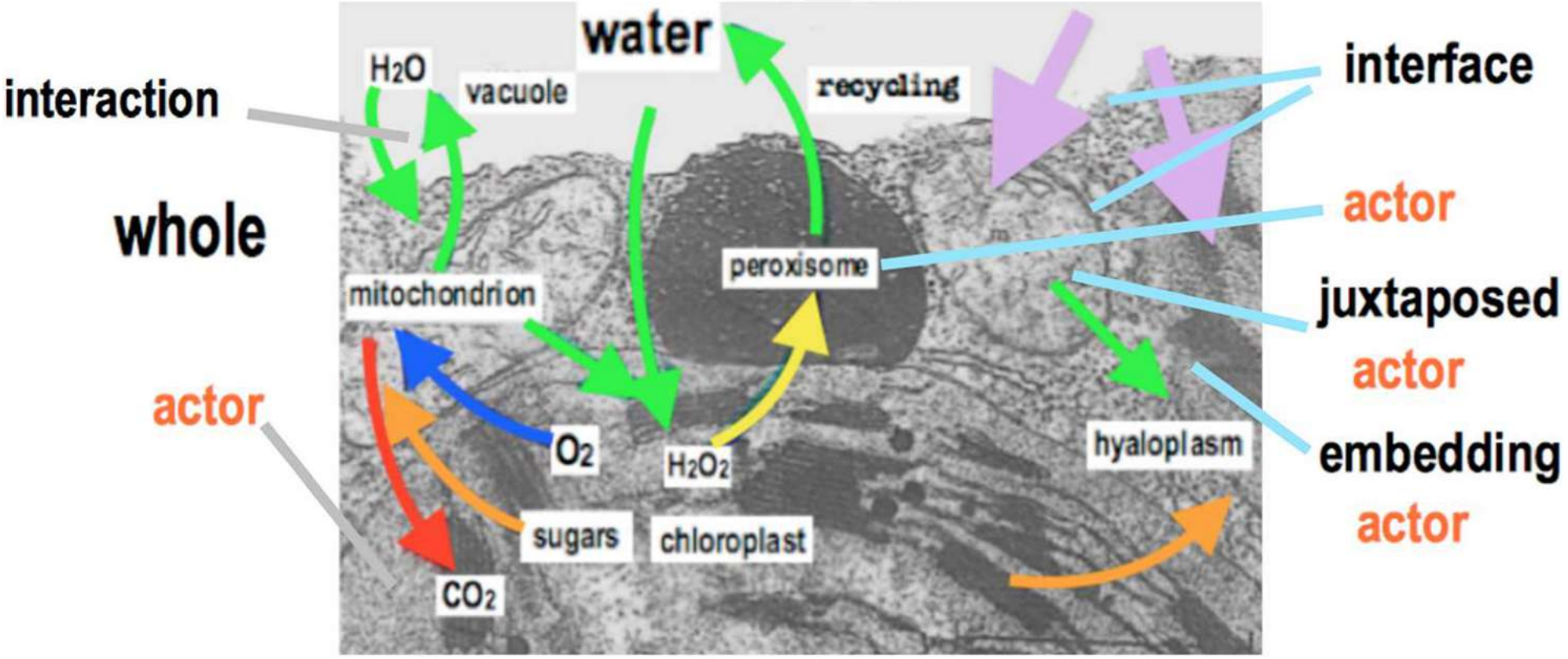
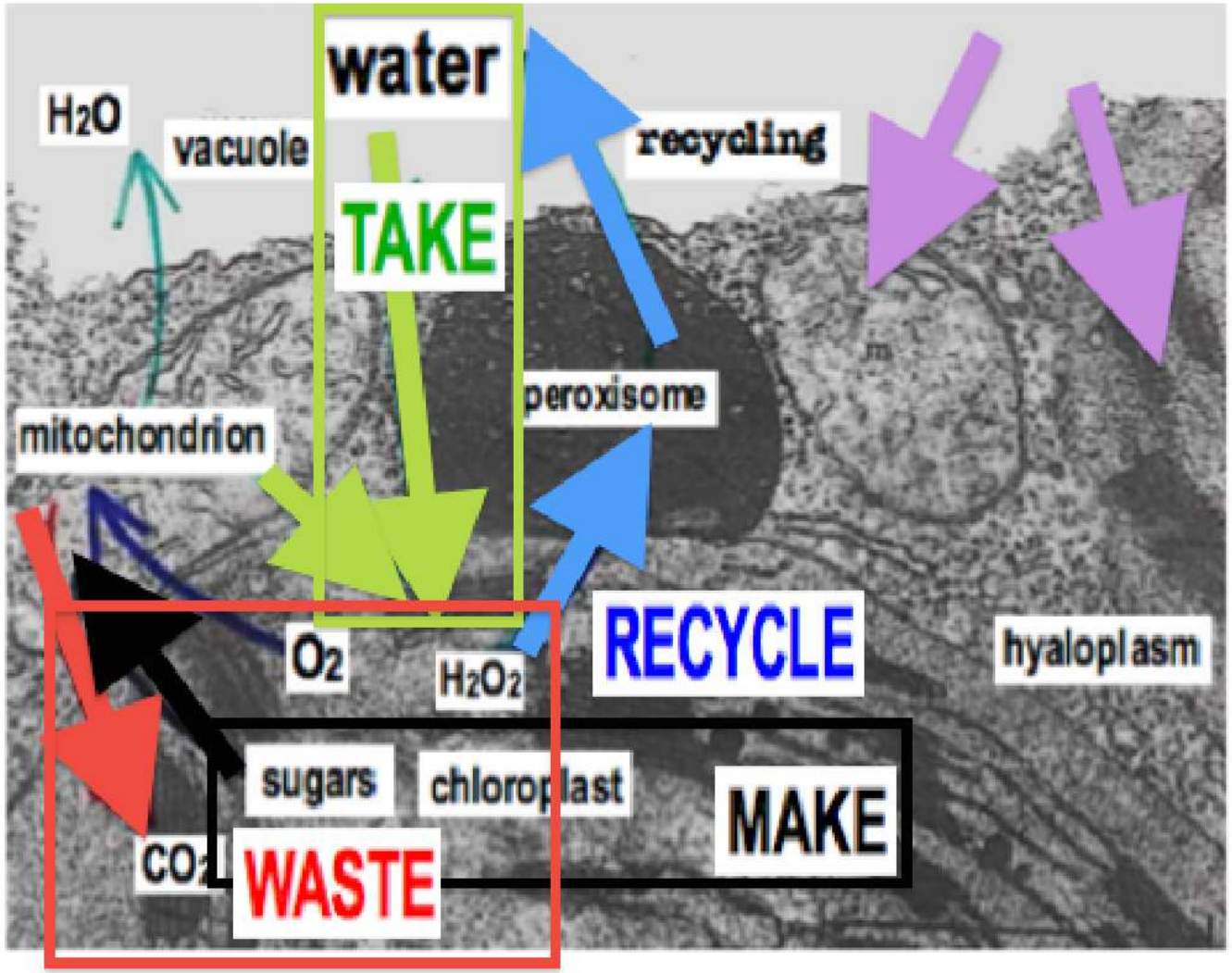





endophysiotope
interaction
whole
ecoexotope
interaction
interface
actor
actor


endophysiotope
interaction
whole
ecoexotope
interaction
interface
actor
actor


water
H2O
vacuole
recycling
interaction
whole
actor
mitochondrion
peroxisome
O2
H2O2
sugars
chloroplast
CO2
hyaloplasm
interface
actor
juxtaposed
actor
embedding
actor



E PLURIBUS
UNUM

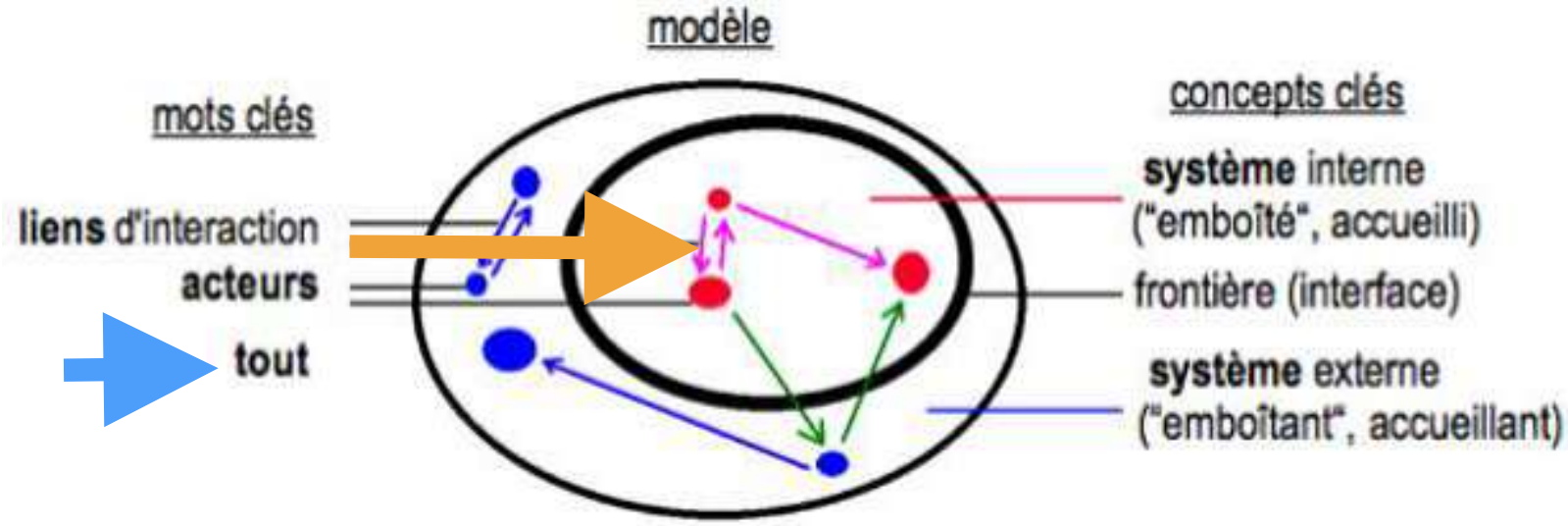
IN VARIETATE
CONCORDIA

AN ECOSYSTEM of ORGANISMS

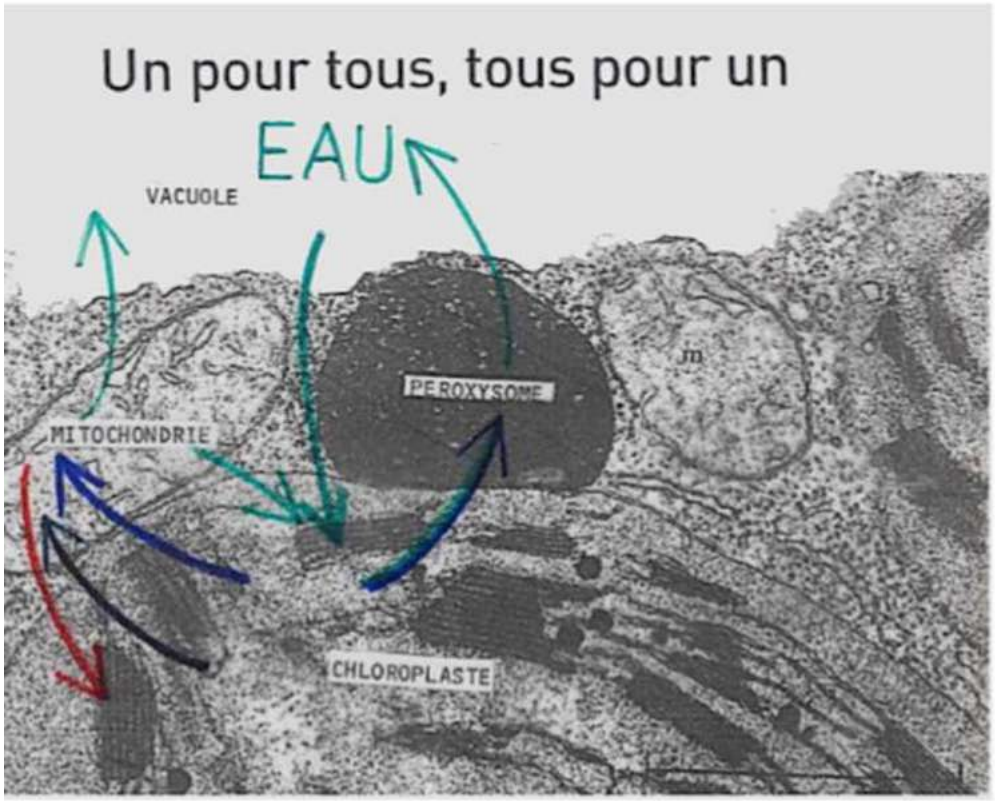
UNUS PRO OMNIBUS
OMNES PRO UNO

UN POUR TOUS
TOUS POUR UN

La croissance, en masse puis en nombre,
est durable
tant qu'elle est soutenable pour chaque partenaire
et soutenue par chaque partenaire



Pea Leaf Dividing Chloroplast



Atelier MCX20

Ingénierie des Systèmes Sanitaires & Sociaux

11 mai 2001, Arcachon

Sciences Biologiques &
Sciences Sanitaires et Sociales,
Faculté des Sciences,
Université de Pau & des Pays de l'Adour,
avenue de l'Université, 64000 PAU, France,

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MCX 20 UPPA

AFCSET, Andé, 17 et 18 mai **2003**

"**Intégration**" dans les systèmes biologiques, sociaux, techniques, culturels.

Organisation, intégration et espace-temps des systèmes vivants.

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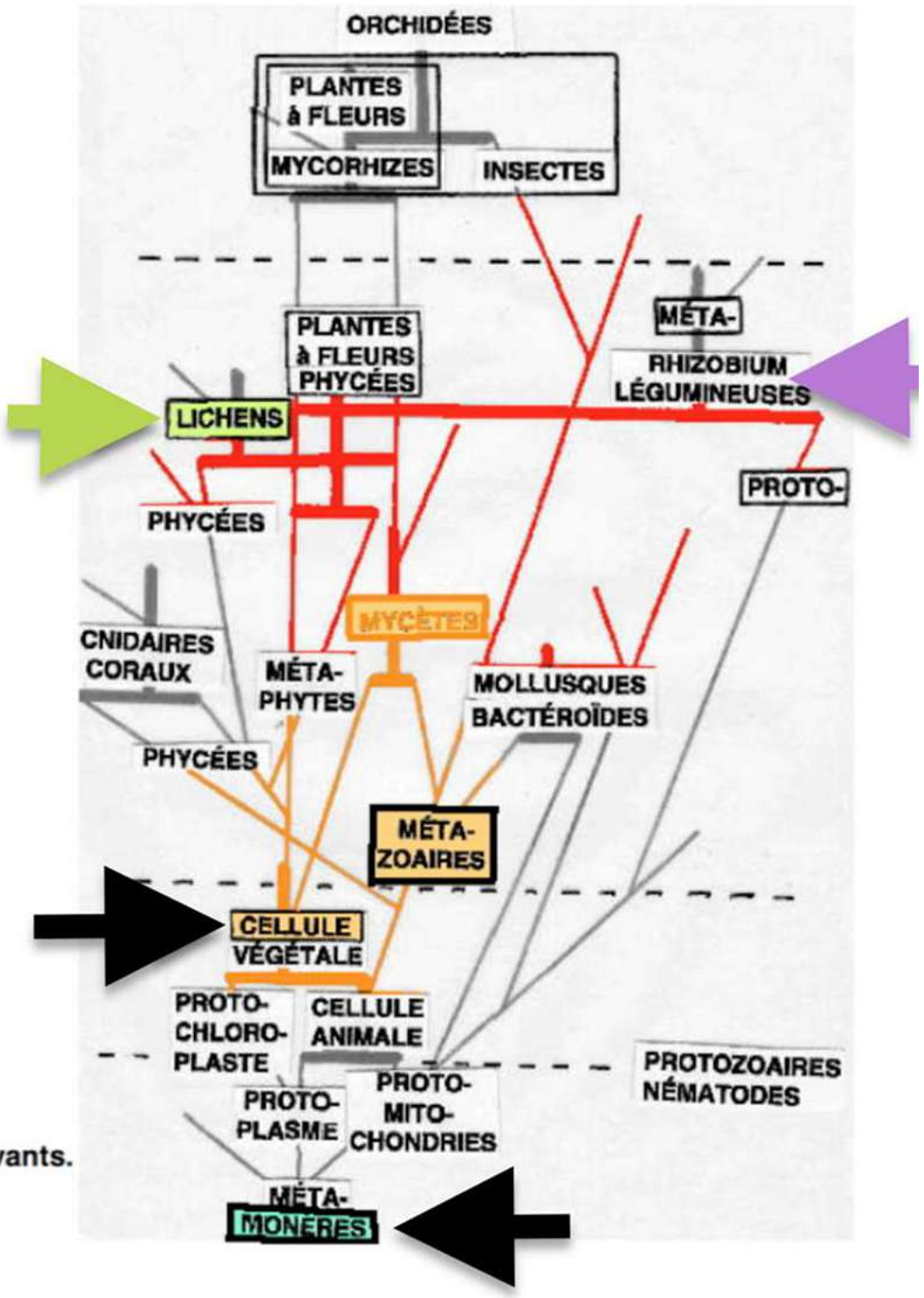
Sciences Biologiques & Sciences Sanitaires et Sociales, Faculté des Sciences,
Université de Pau et des Pays de l'Adour, avenue de l'Université 64000 PAU



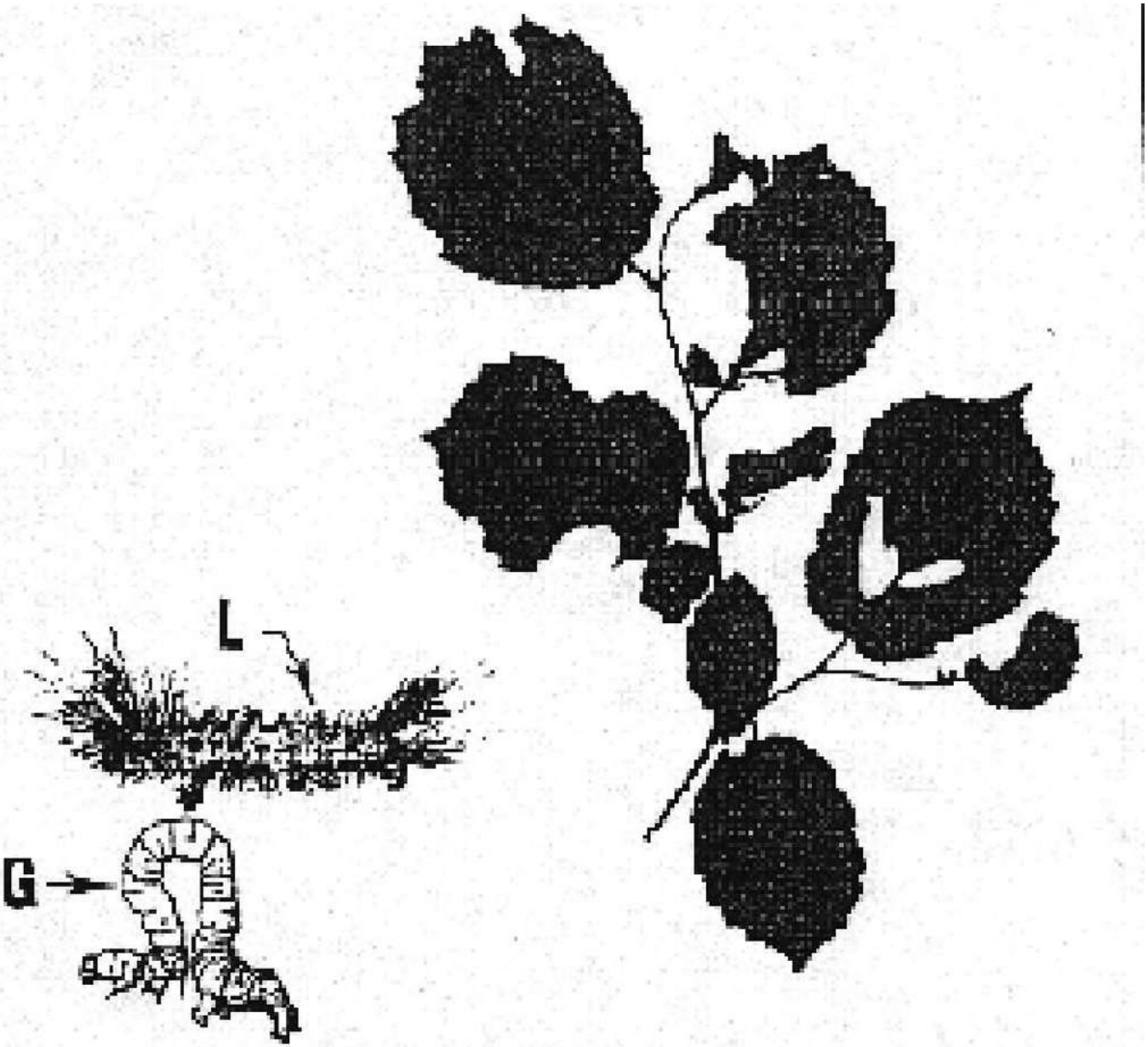
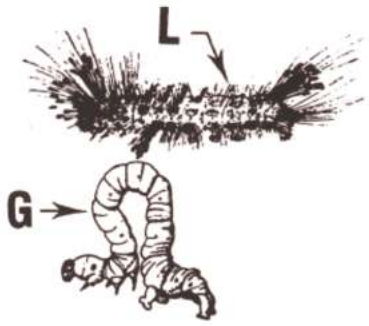
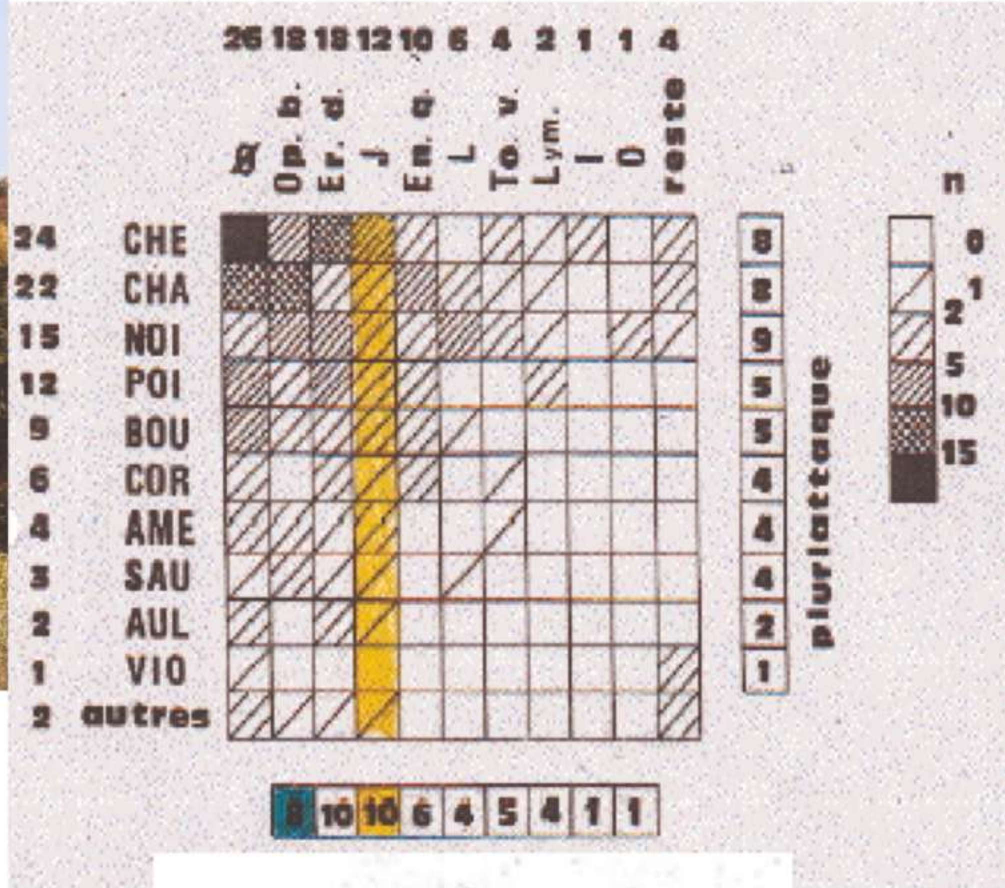


Figure 1. Exemple de ravageurs et d'aspect des ravages sur le noisetier. Chenilles (x2): G chenille arpenteuse d'un Geometridae (Ennomos quercinaria Hüfnagel), L chenille à poils urticants d'un Lymantriidae (Orgyia antiqua L.) (d'après: Carter & Hargreaves, 1986; Novák, Severa & Luquet, 1986); aspect des ravages (x1/4): rameau de noisetier commun ou coudrier (Corylus avellana L.).


L
G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Ø
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Em. a.
L
To. v.
Lym.
I
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22 CHA
15 NOI
12 POI
9 BOU
6 COR
4 AME
3 SAU
2 AUL
1 VIO
2 autres
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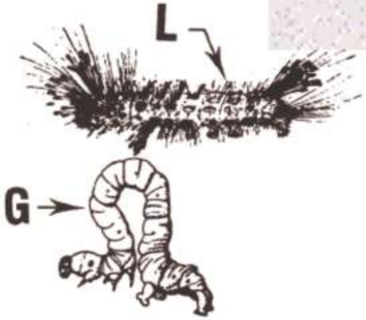

L
G

Pierre BRICAGE (**Ecophysiologie Végétale** et **Informatique Appliquée**)
Faculté des Sciences & Techniques, Université de Pau et des Pays de l'Adour

Bricage P., 1991

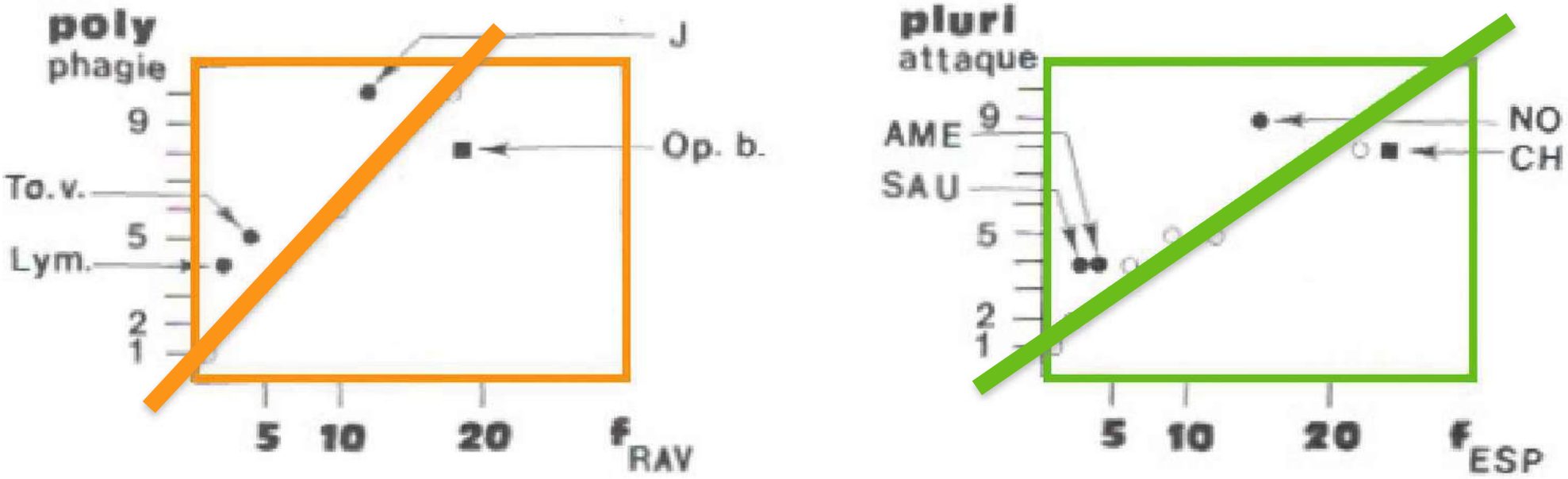
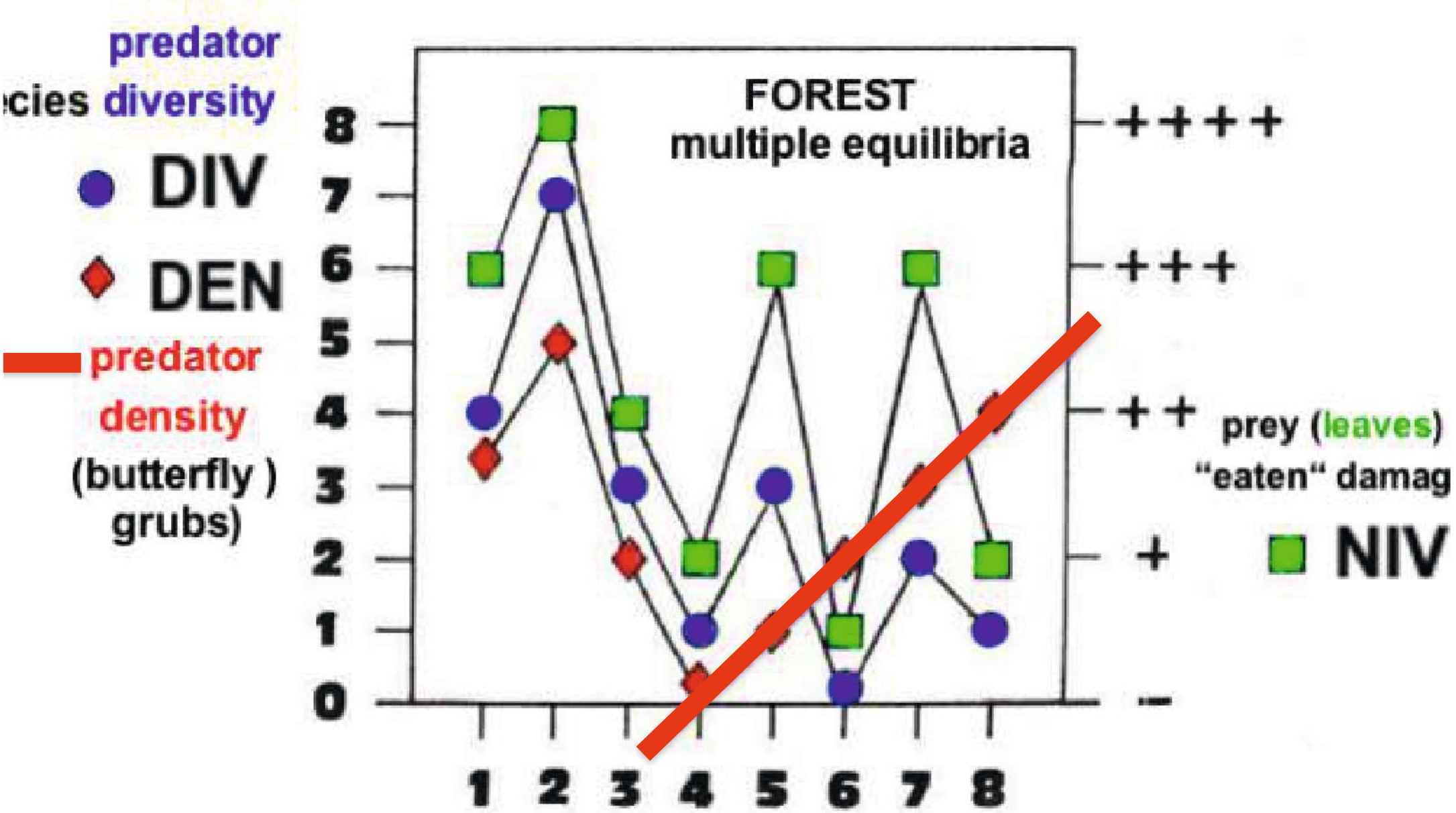
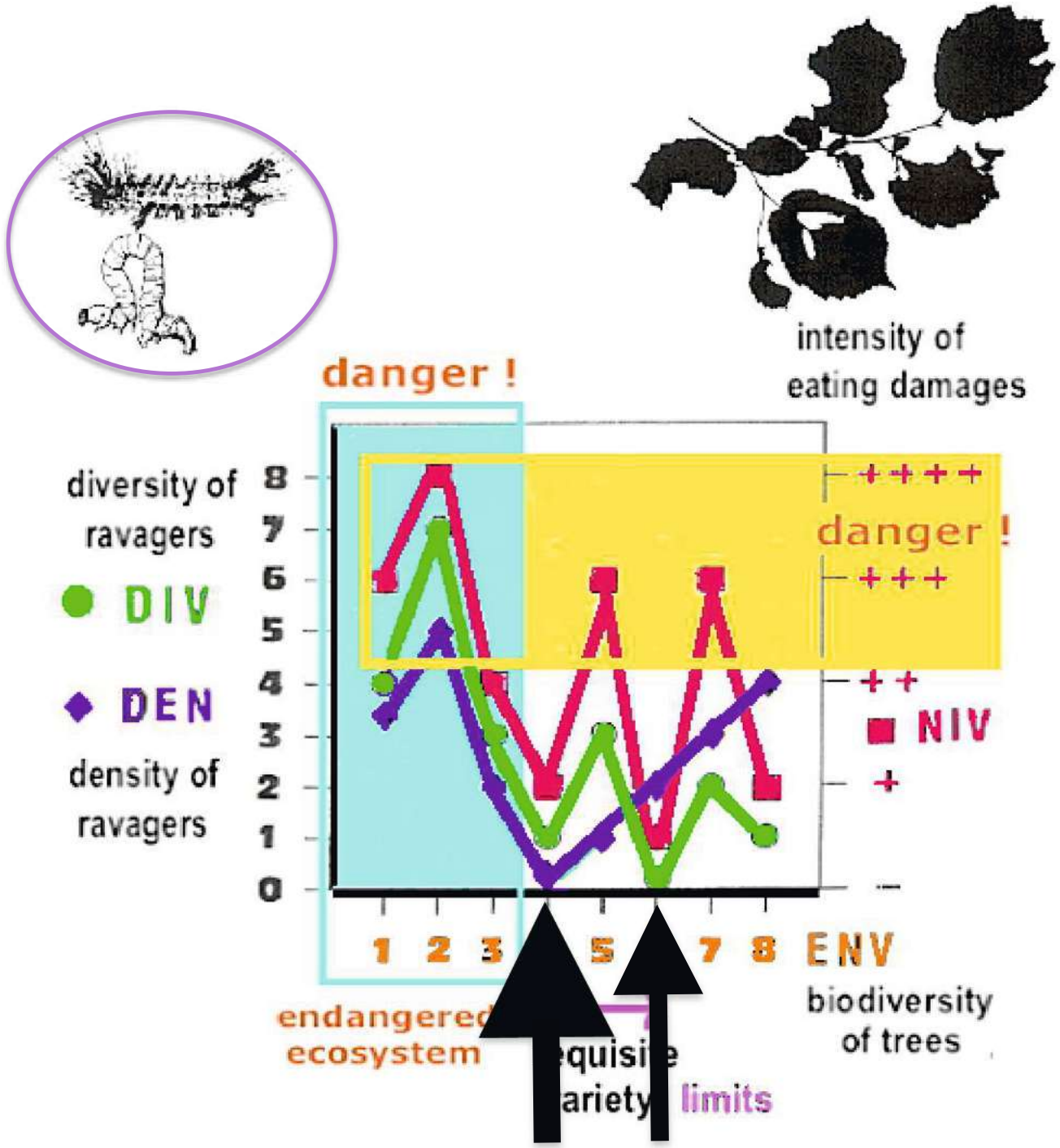


Figure 2. **Polyphagie, pluri-attaque et fréquences des ravageurs et des feuillus.**
f_{RAV} fréquence d'une espèce de ravageurs en %, f_{ESP} fréquence d'une espèce de feuillus en %, **poly**phagie et **pluri**attaque (**calculées selon figure 1**);
chaque symbole du plan graphique représente au moins une relation feuillu-ravageur, les relations sont rapportées aux fréquences relatives et mettent en évidence des situations de polyphagie ou de pluriattaque non aléatoires (**en noir**) ou aléatoires (linéairement proportionnelles aux fréquences) **en blanc**;
ravageurs: **J, Lym, To. v.** espèces plus polyphages, **Op. b.** espèce moins polyphage; feuillus: **AME, NOI, SAU** espèces plus attaquées, **CHE** espèce moins attaquée (voir **figure 1**)



Bricage P. & al. (1990)
defoliator Lepidoptera associations
in a hardwood forest.
Acta Entomologica Vasconae 1: 5-2(


danger !
intensity of
eating damages
diversity of
ravagers
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DEN
density of
ravagers
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7
6
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4
3
2
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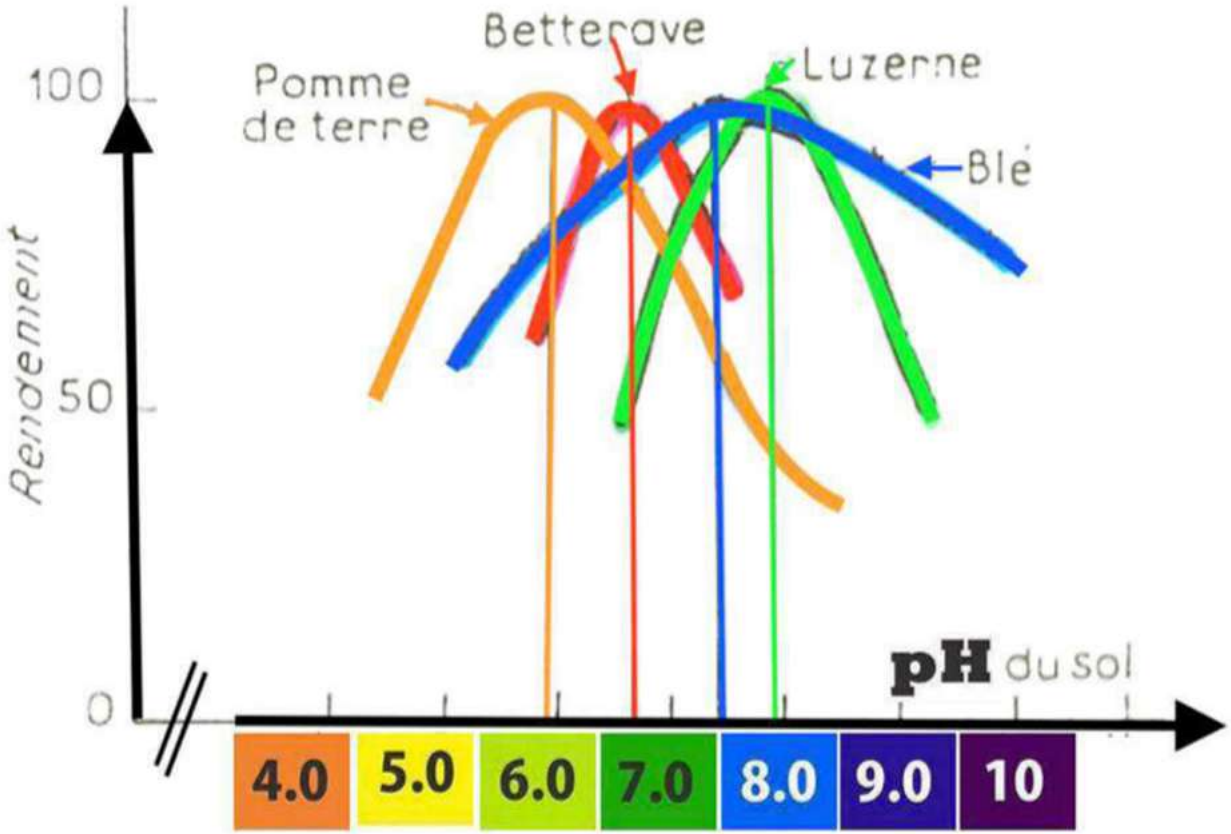
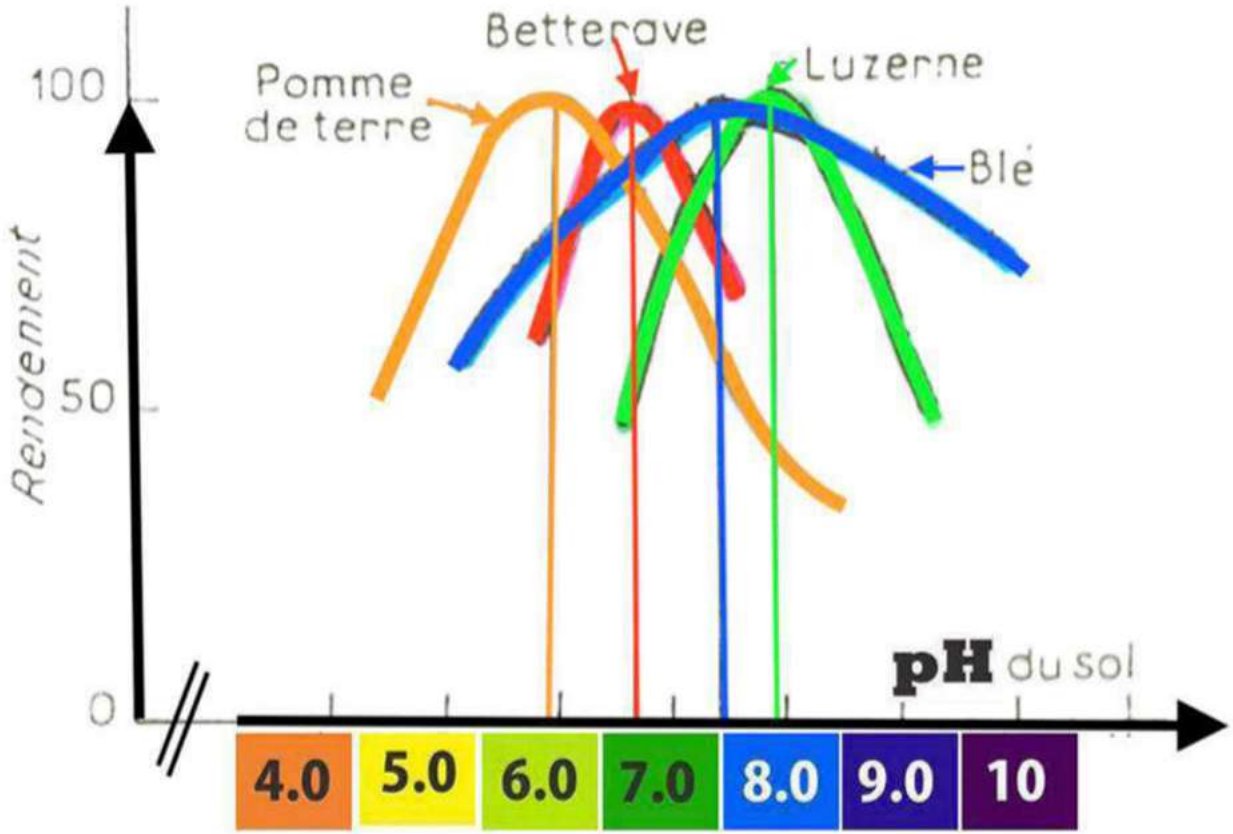
danger !
+++
++
NIV
+
–
1 2 3 5 7 8 ENV
biodiversity
of trees
endangered
ecosystem
limits



pH CHART

$[H^+] = 10^{-pH}$



pH CHART

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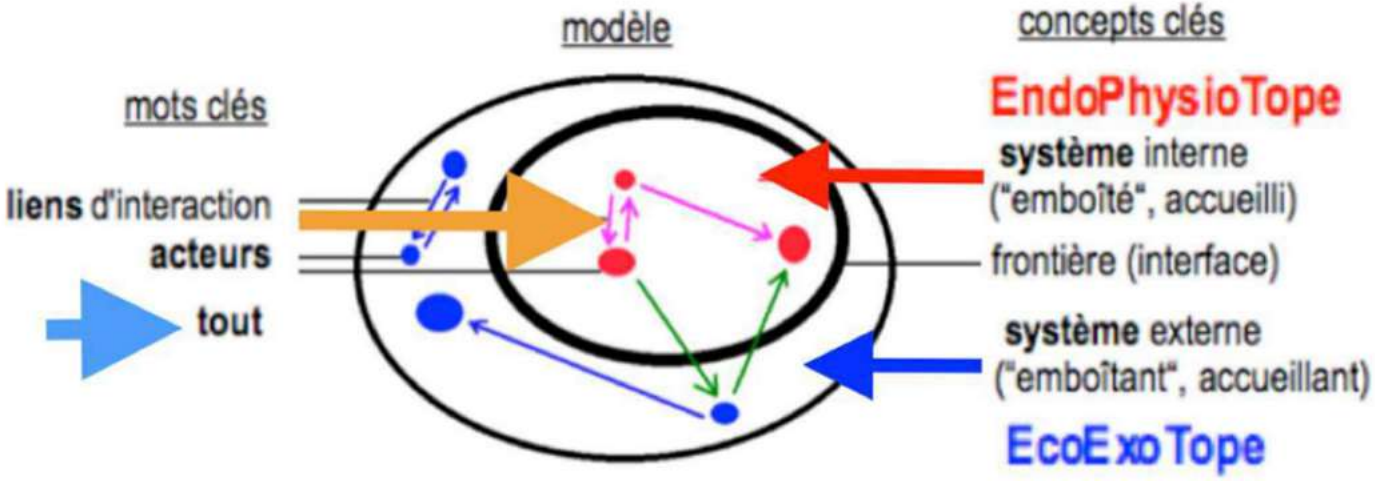

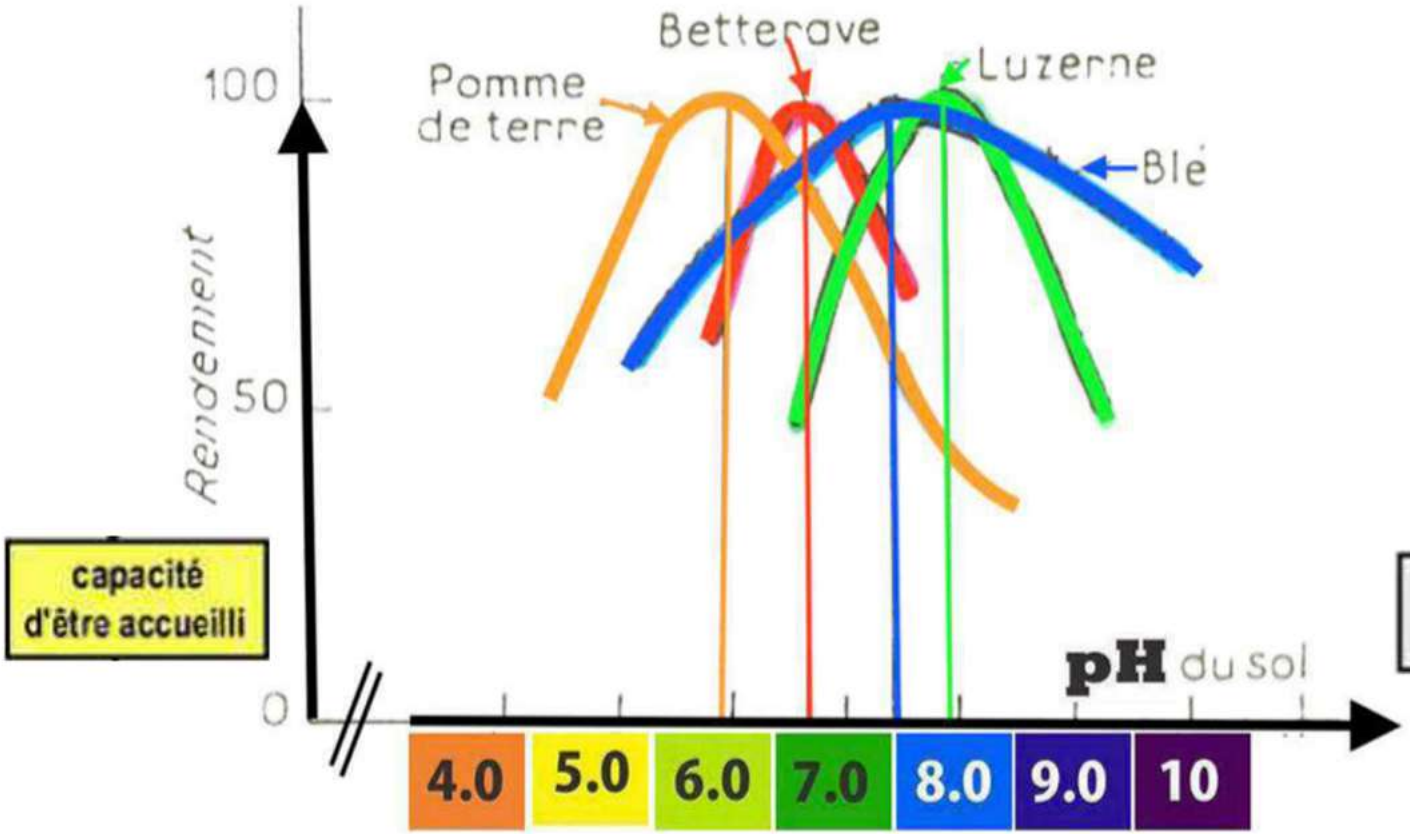

pH CHART

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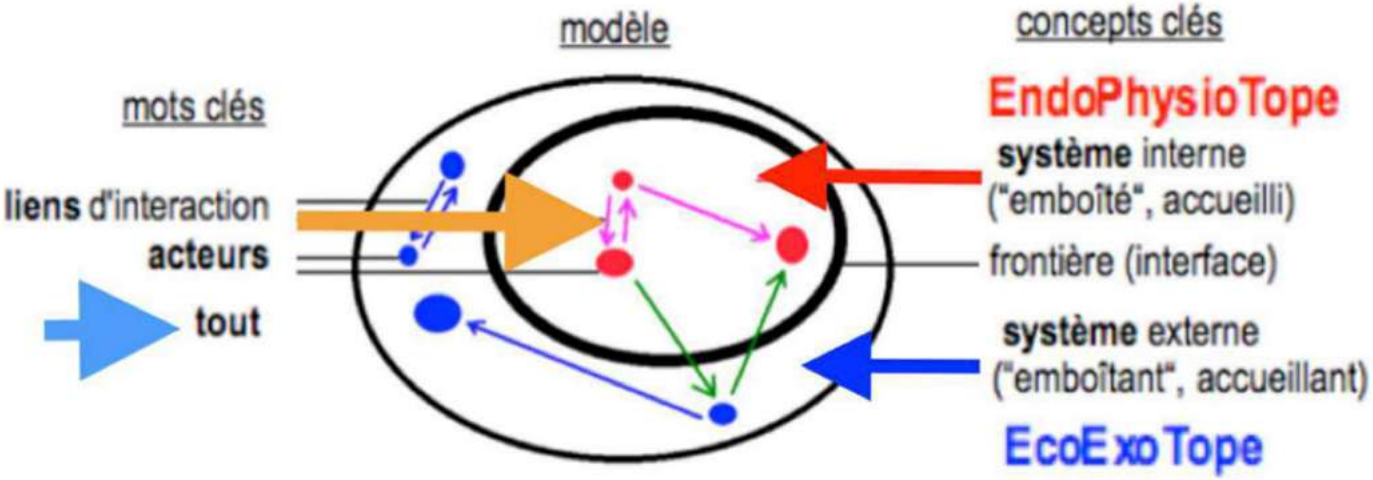
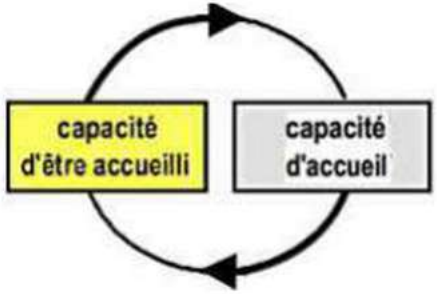
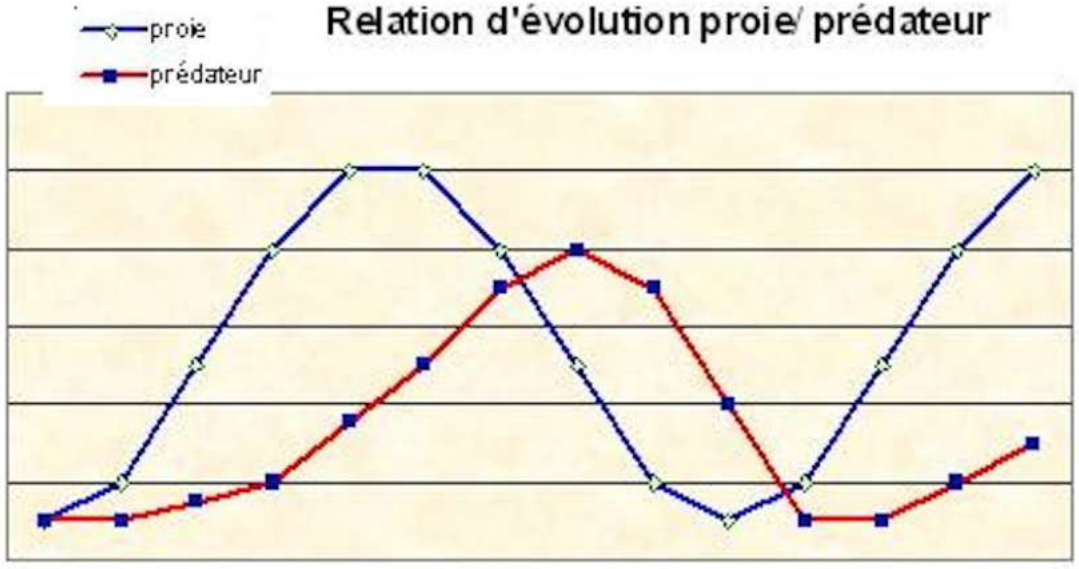
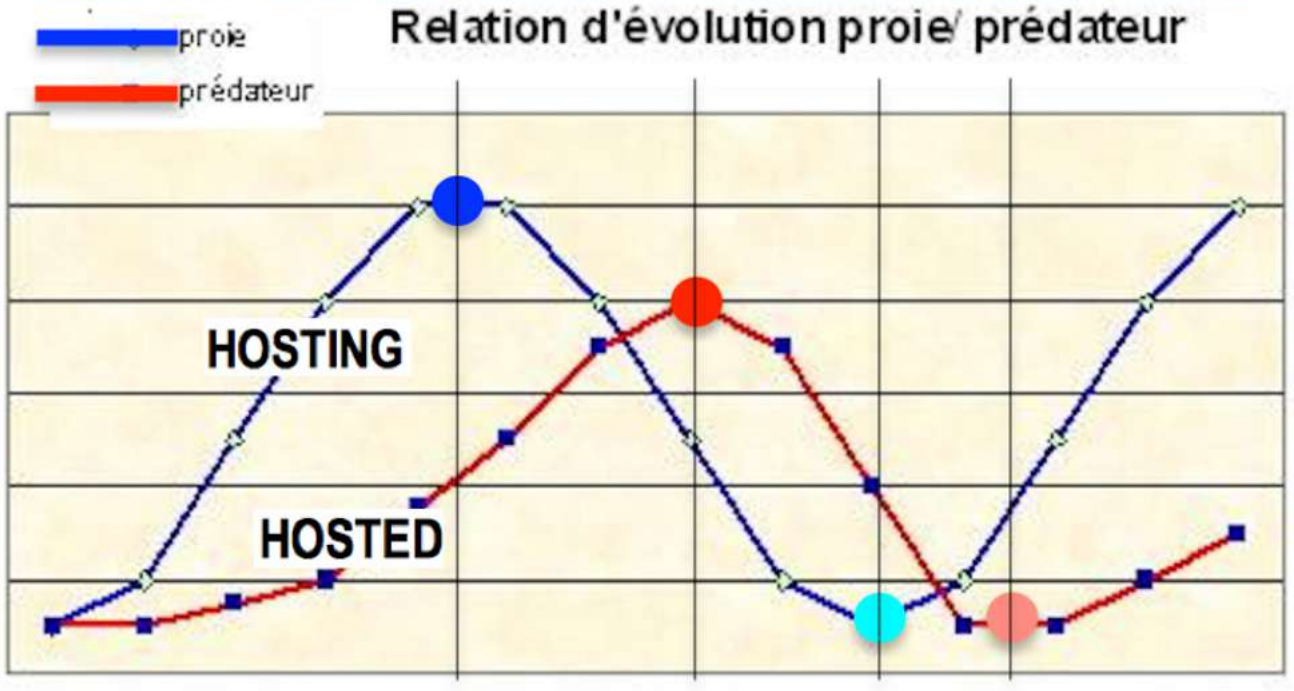
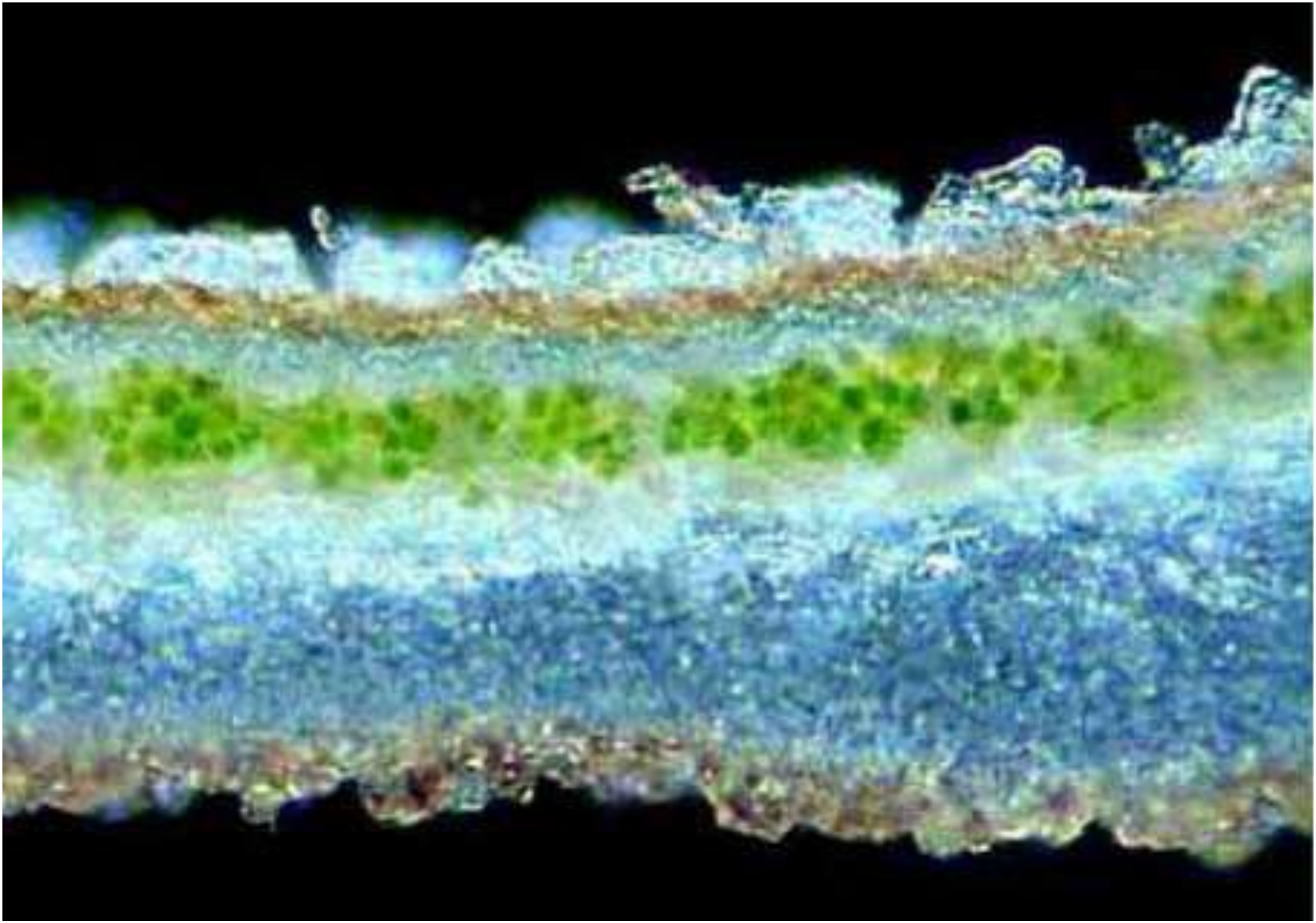


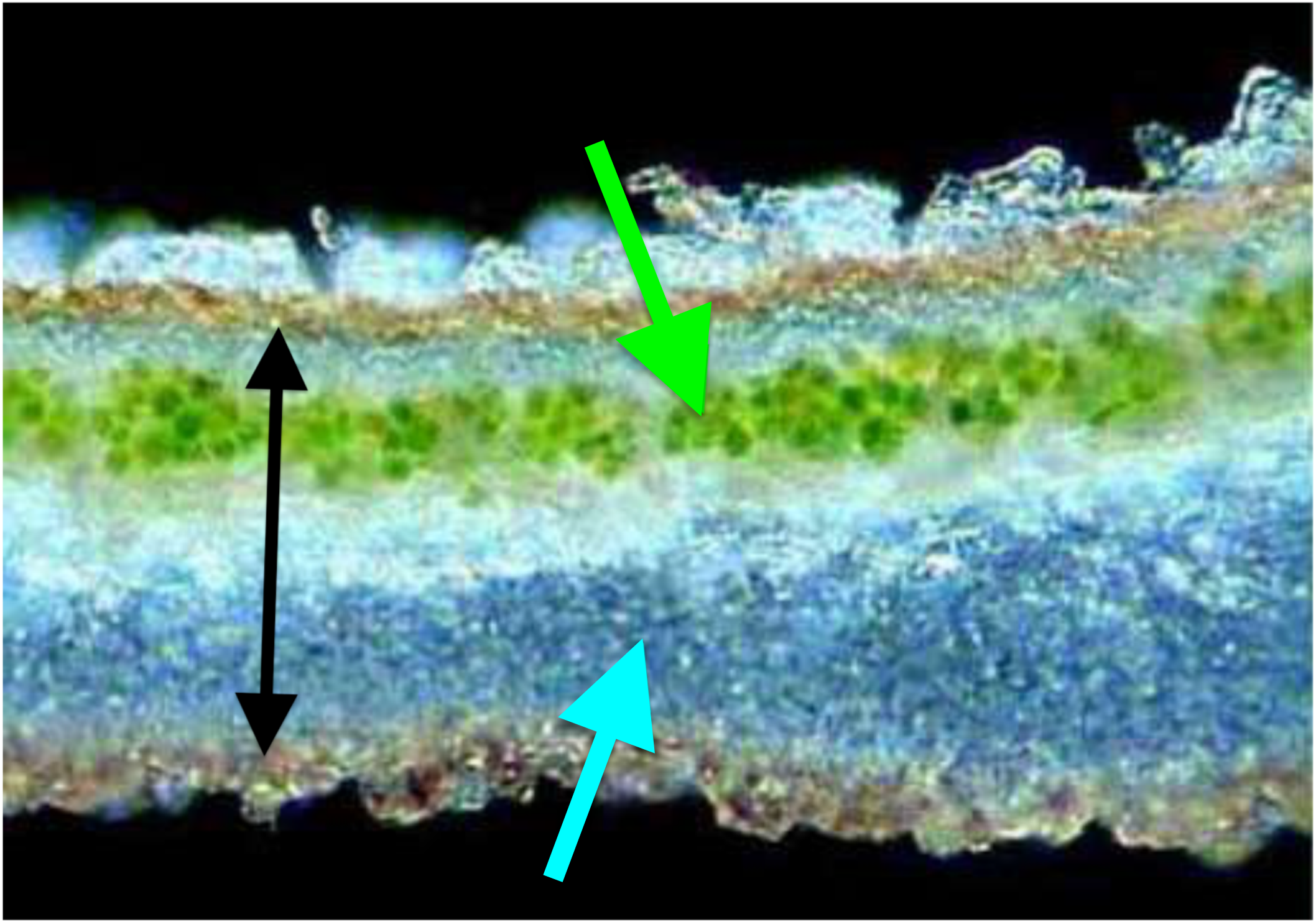


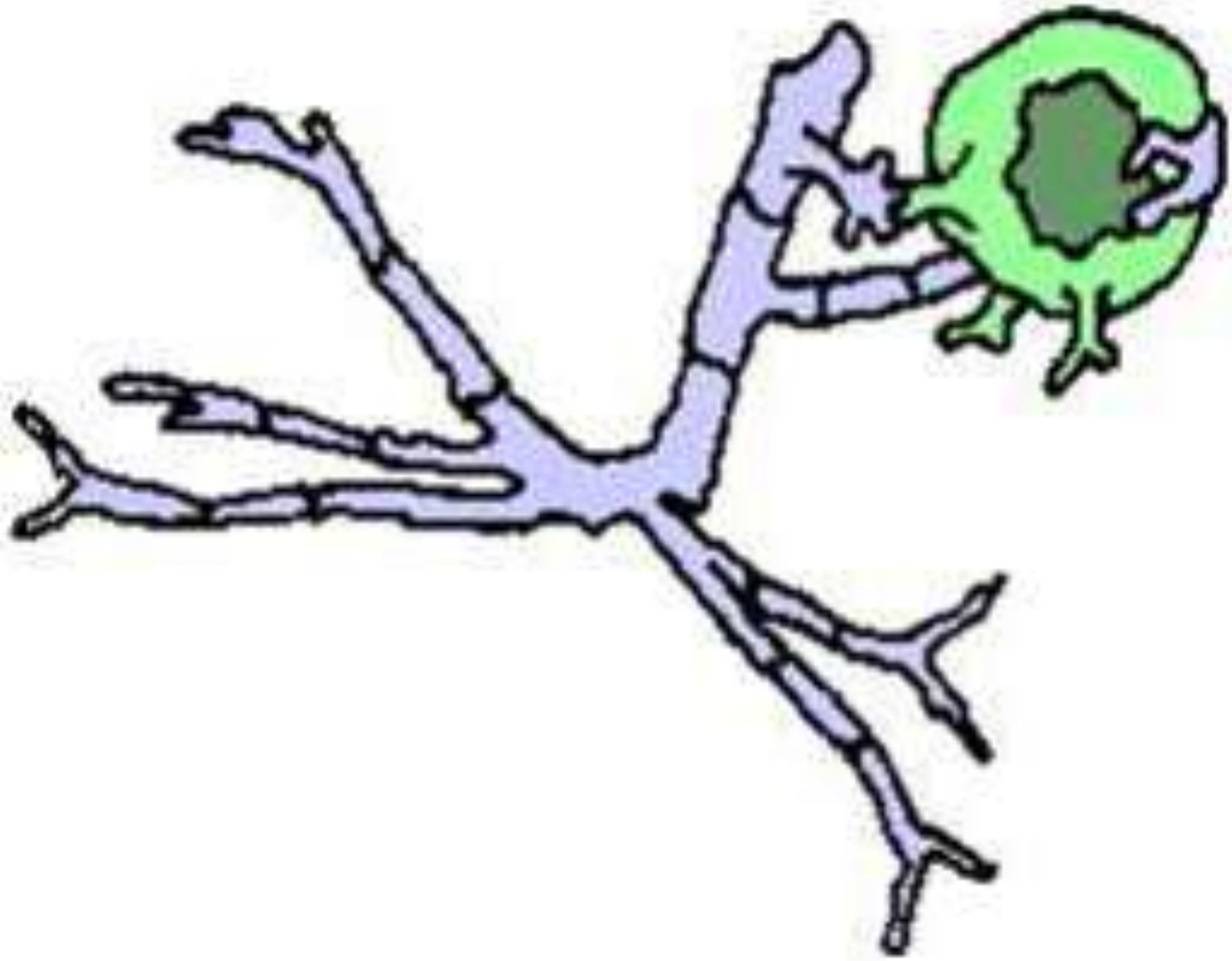

Relation d'évolution proie/ prédateur
proie
prédateur

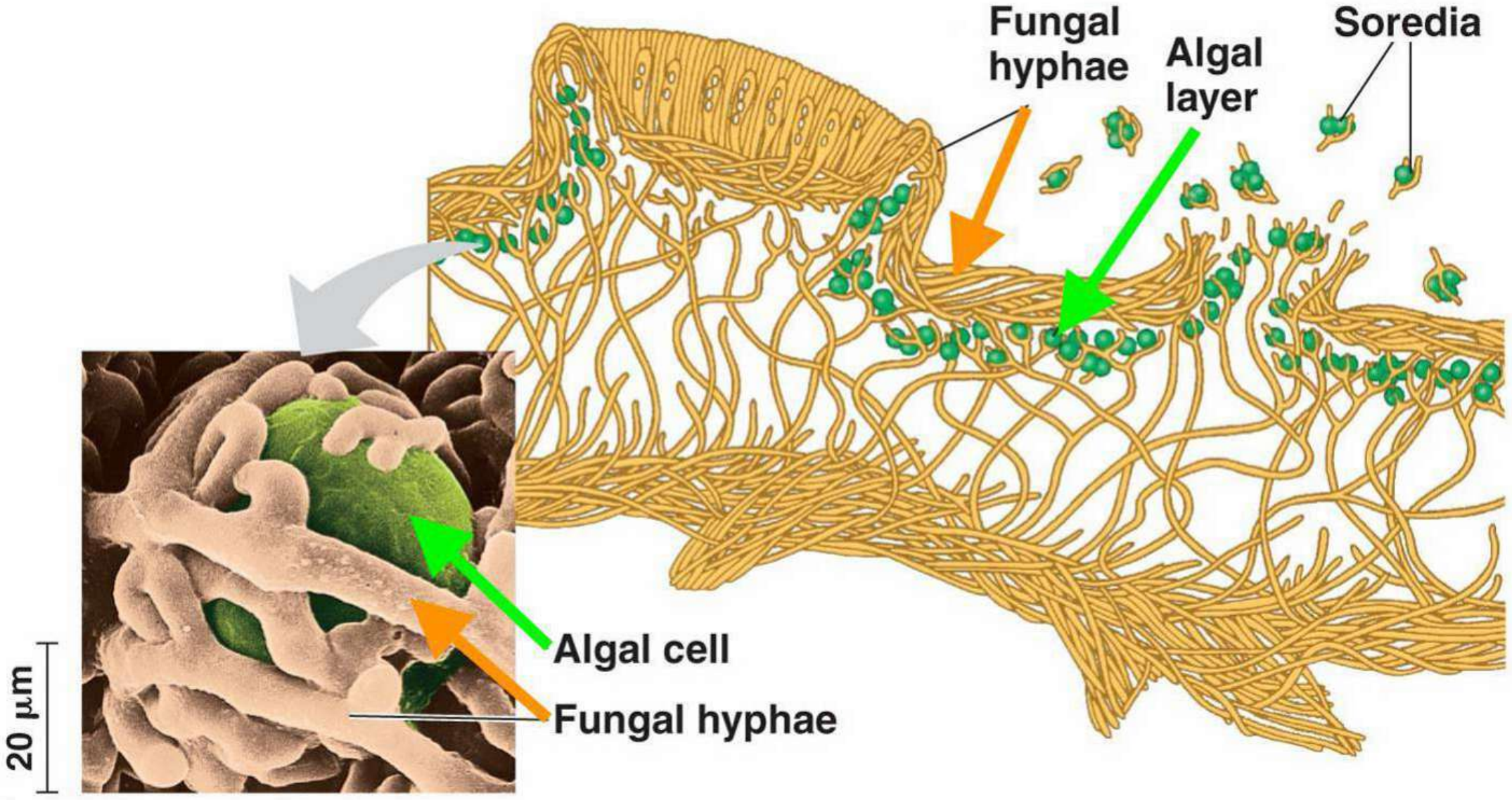

Relation d'évolution proie/ prédateur
proie
prédateur
HOSTING
HOSTED

Crustose Ophioparma lichen. There are 13,500 species of lichen and they dominate 7 percent of the Earth's surface. Matthew P. Nelsen, Field Museum








Fungal hyphae
Algal layer
Soredia
Algal cell
Fungal hyphae
20 µm

LICHEN : le TOUT

Les PARTIES : champignon, algue
(bactérie)

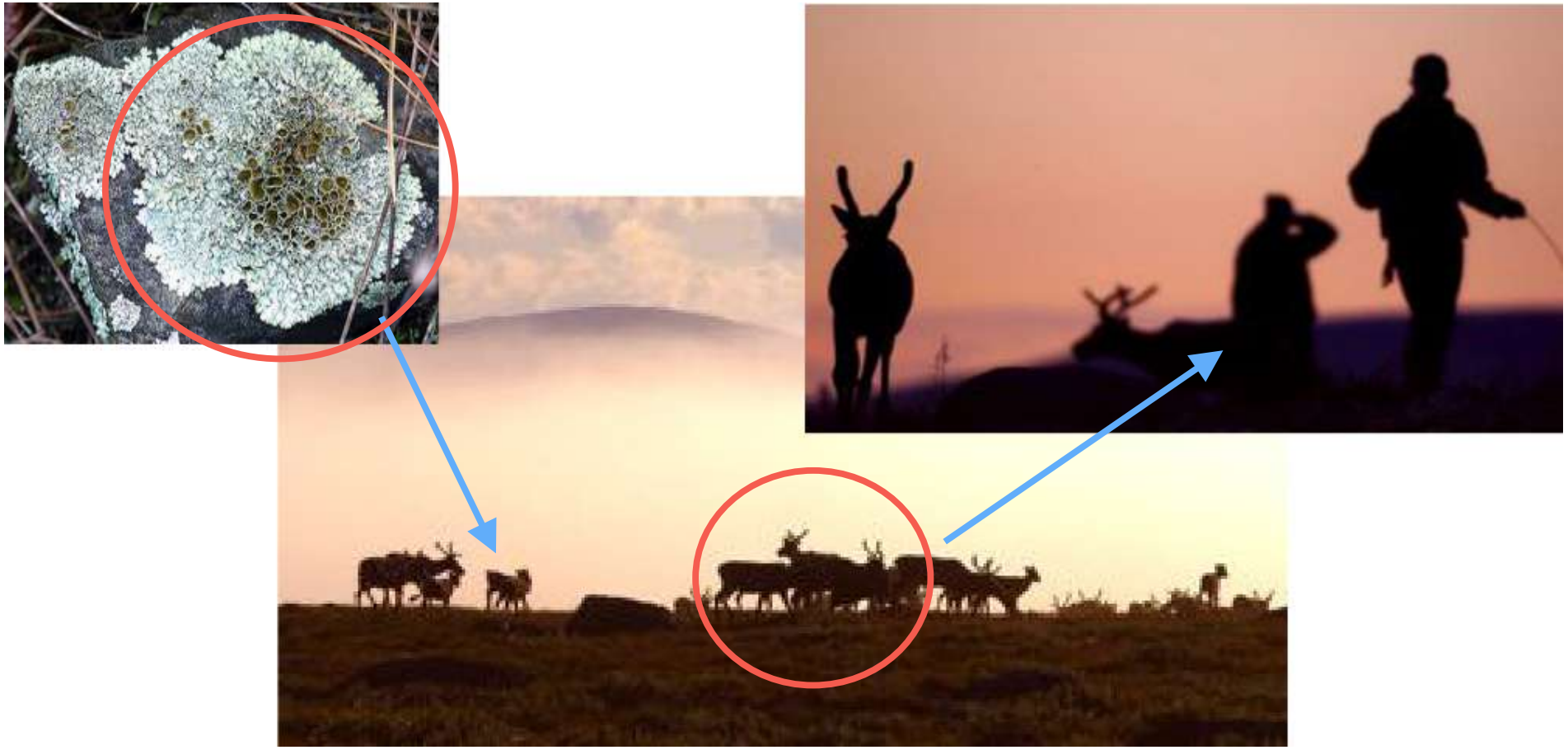
SURVIVRE : manger & ne pas être mangé

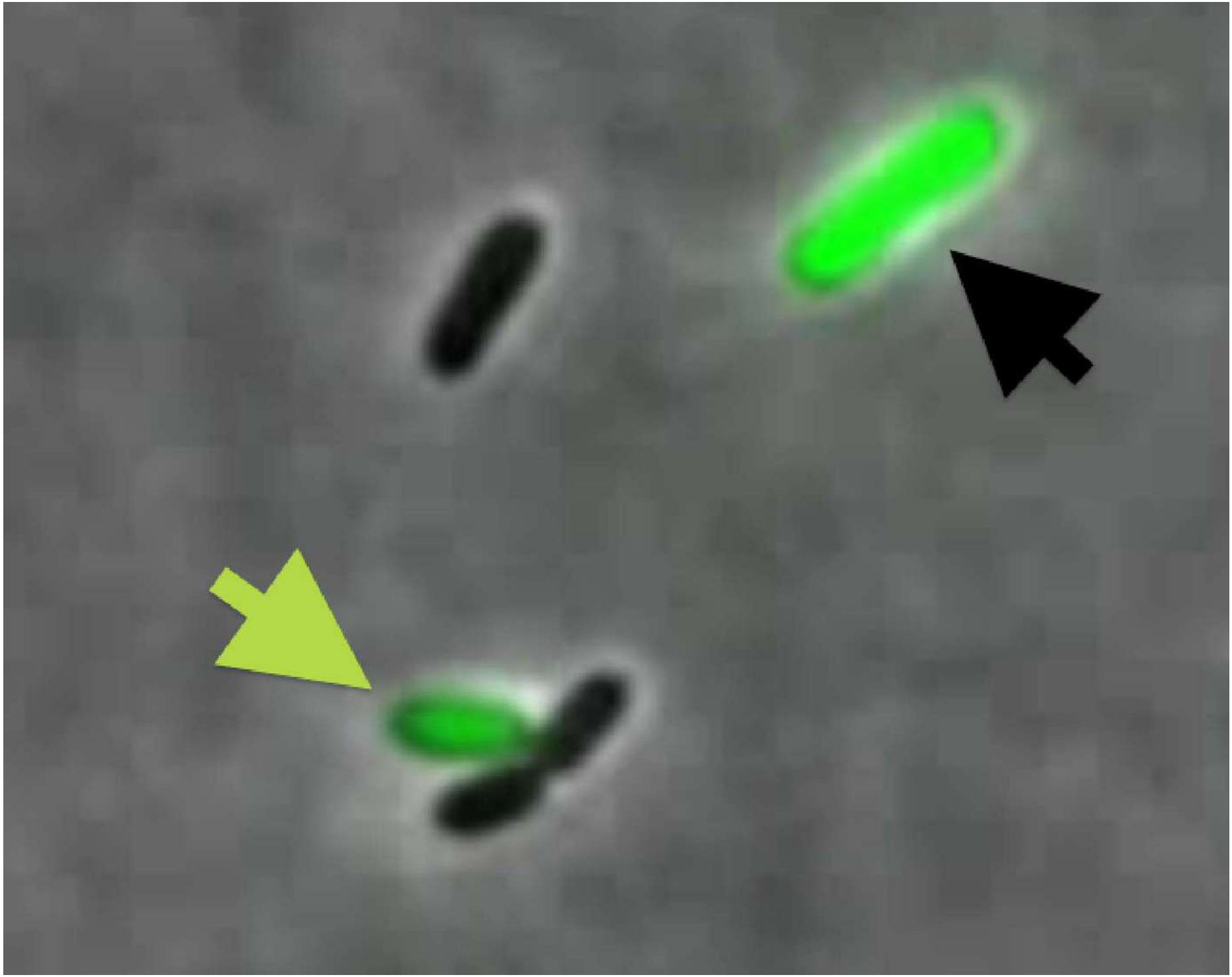
AVANTAGES pour l'un
INCONVÉNIENTS pour l'autre
et réciproquement

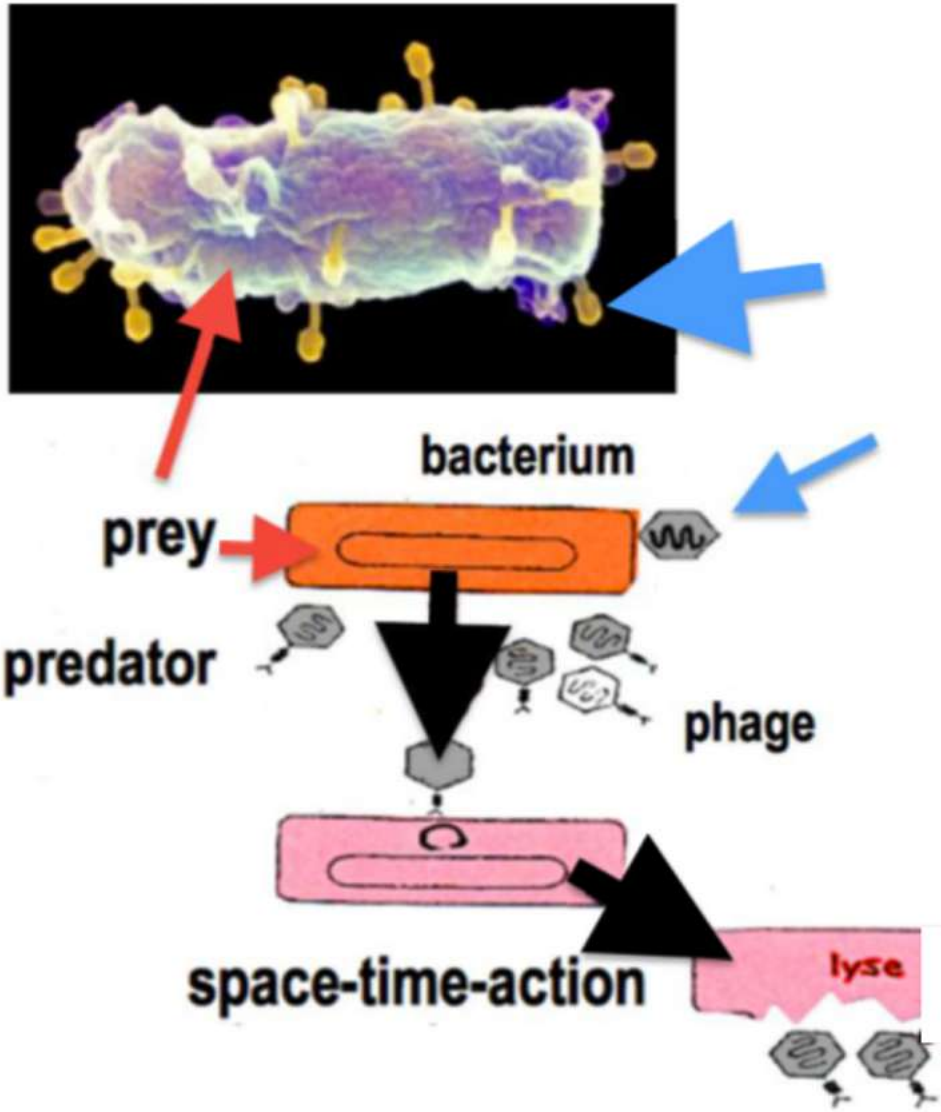
Pour que l'UN SURVIVE,
il faut d'abord
que l'AUTRE SURVIVE.
La CROISSANCE de l'un est
LIMITÉE par celle de l'autre
et RÉCIPROQUEMENT.

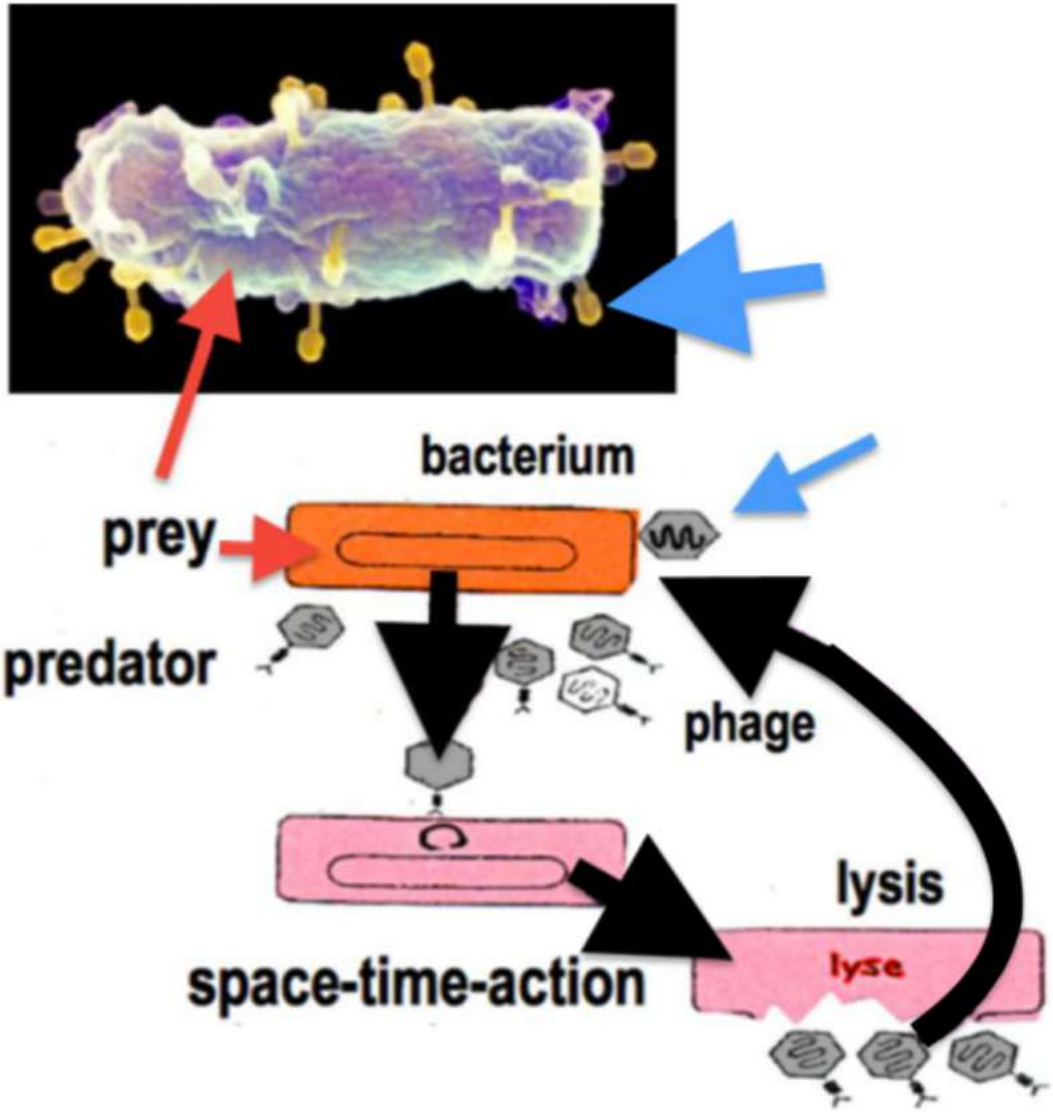
perte simultanée
par chaque partenaire
de la capacité de détruire l'autre
MÉTAMORPHOSES
simultanées

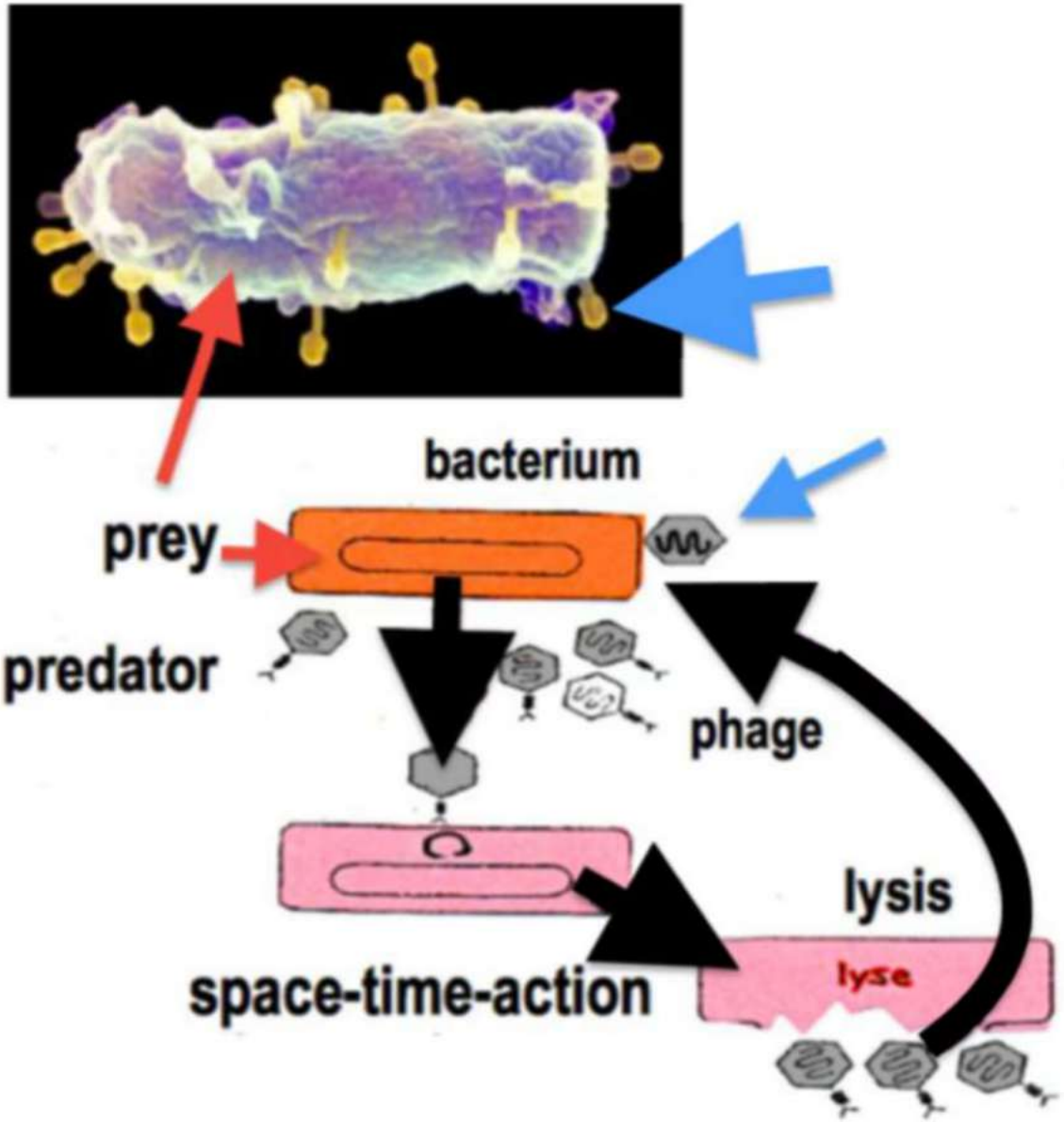
ÉMERGENCE : acides lichéniques
LANGAGE NOUVEAU
NOUVELLES FRONTIÈRES
SURVIVRE & SE SURVIVRE :
bénéfice global



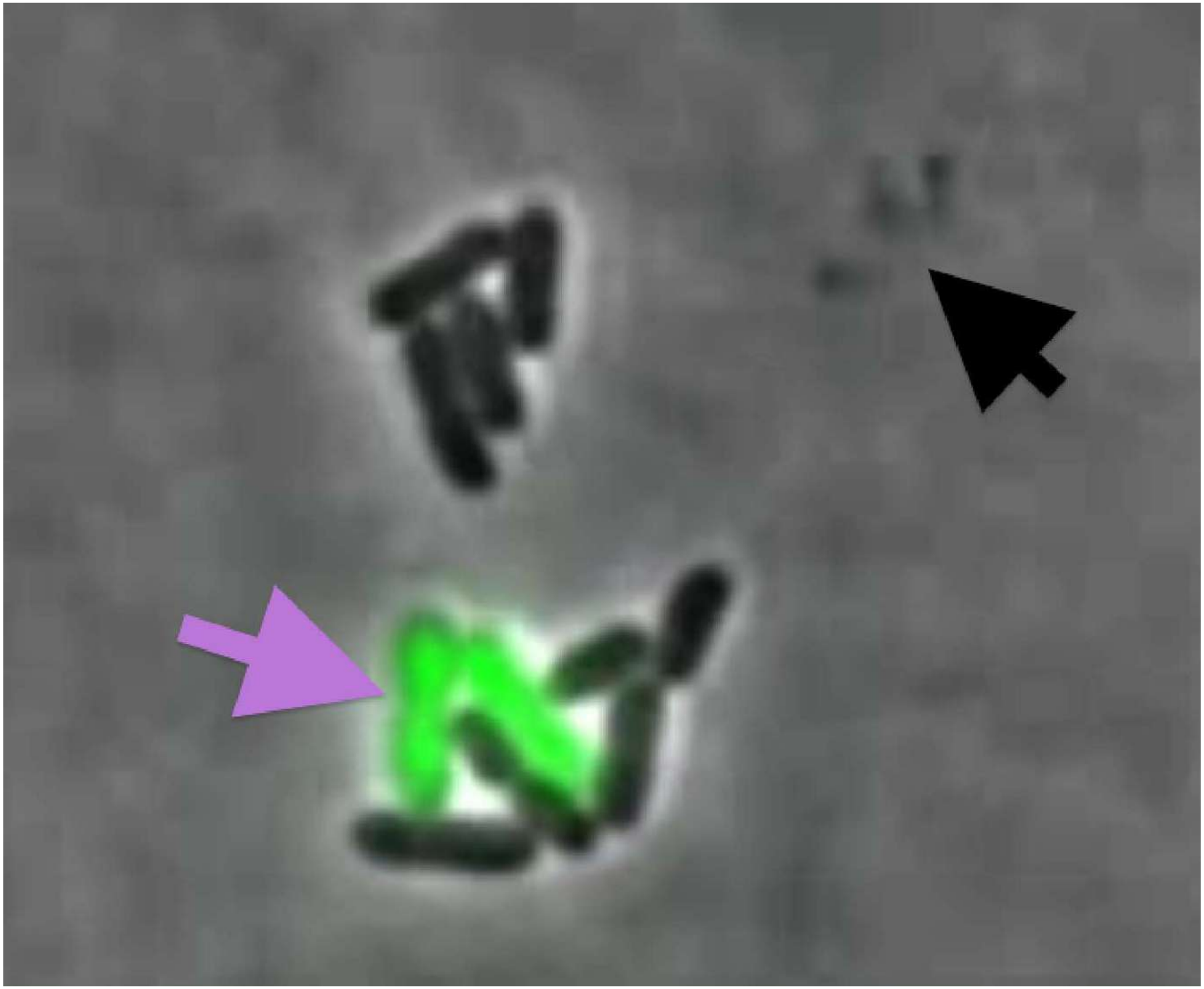


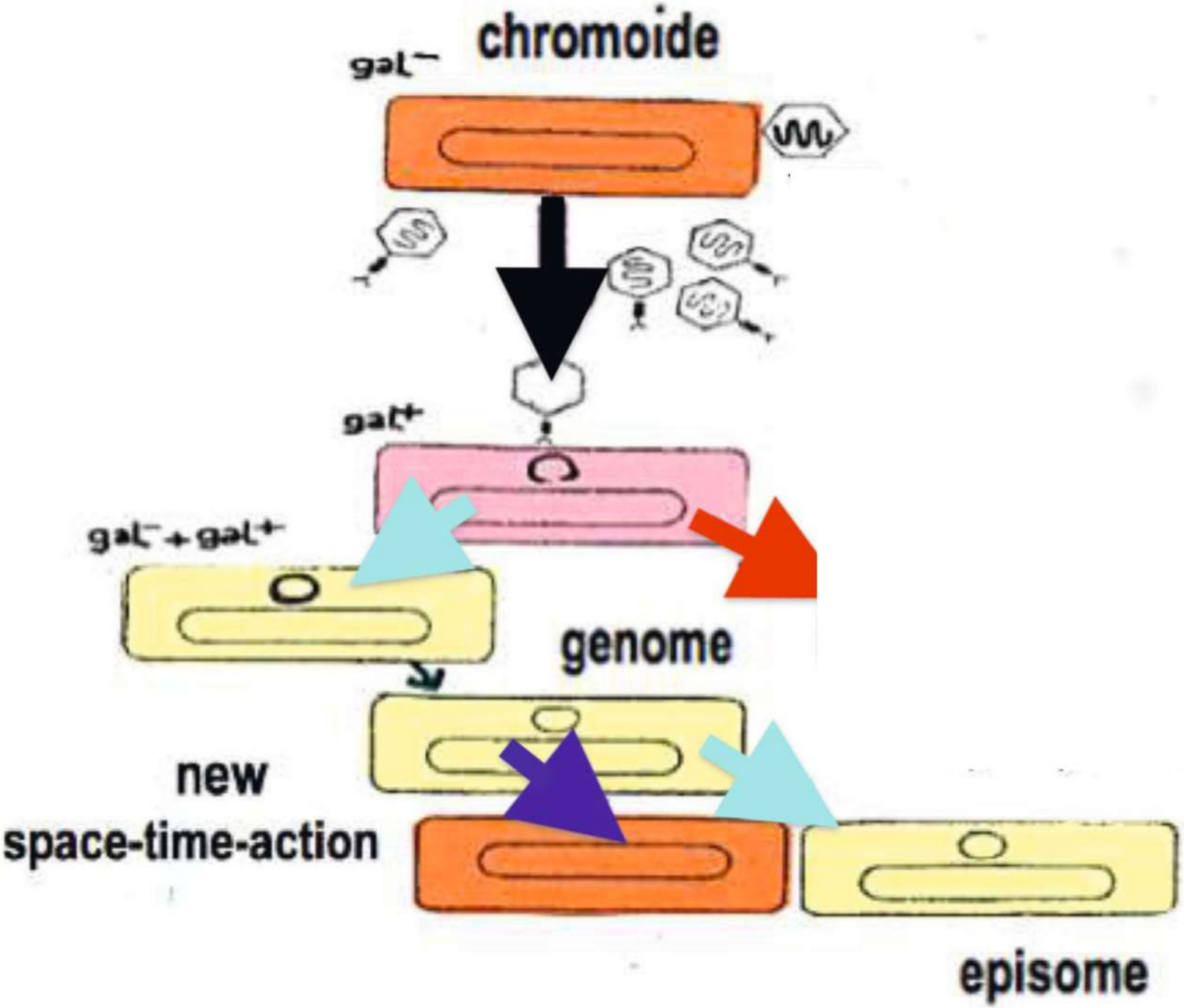

bacterium
prey
predator
phage
space-time-action
lyse

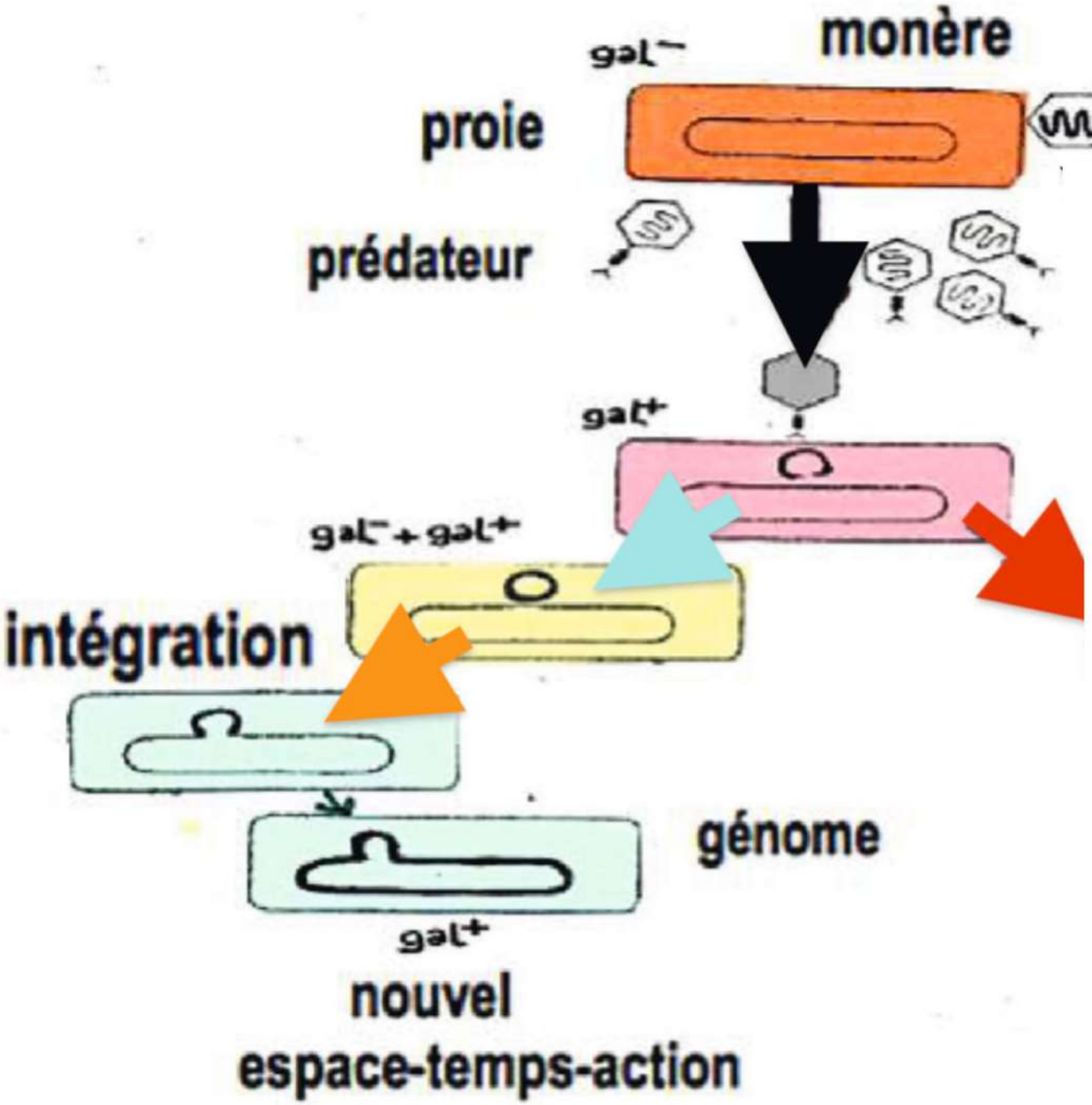

bacterium
prey
predator
phage
lysis
lyse
space-time-action

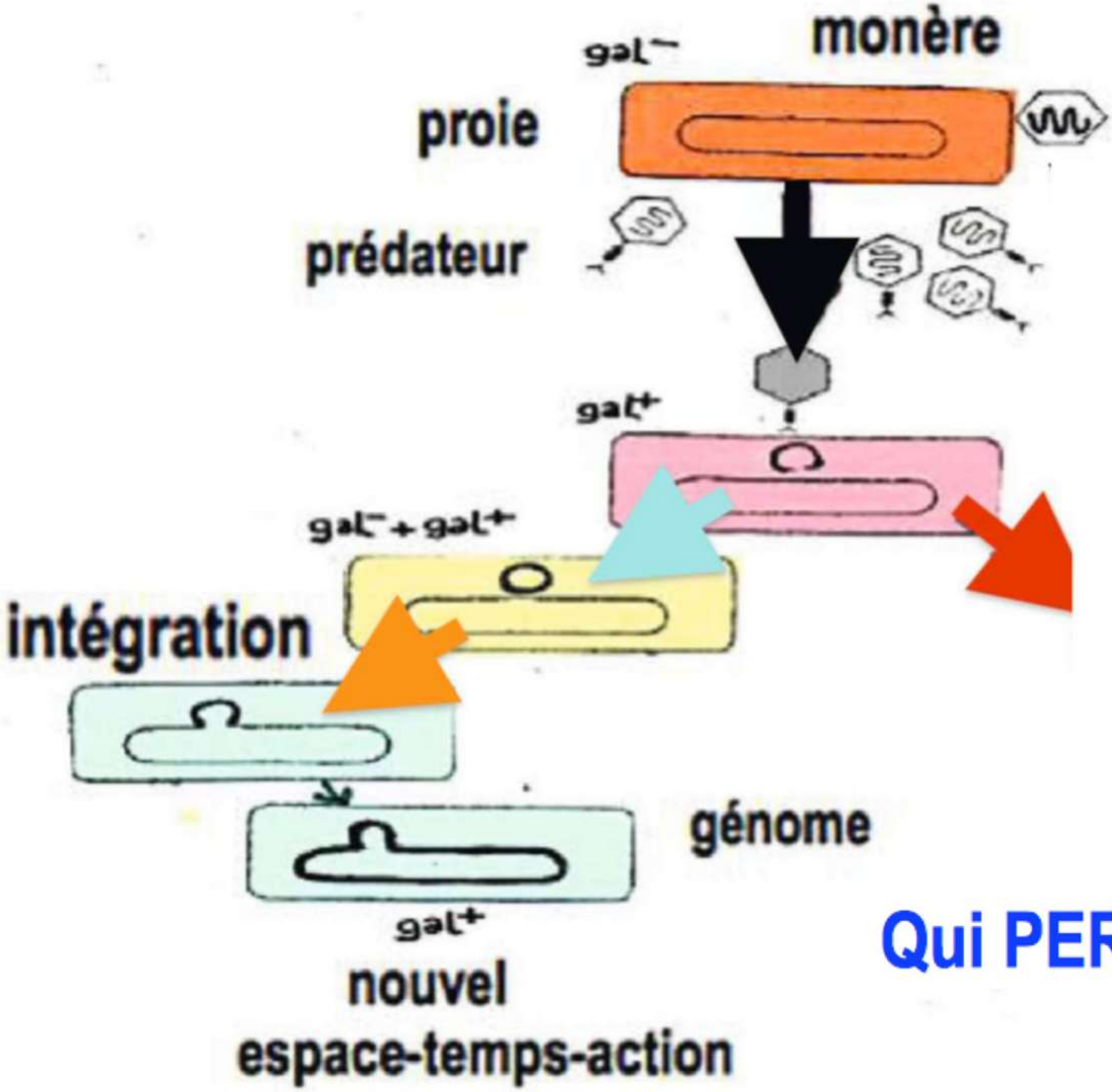


Qui GAGNE... PERD !



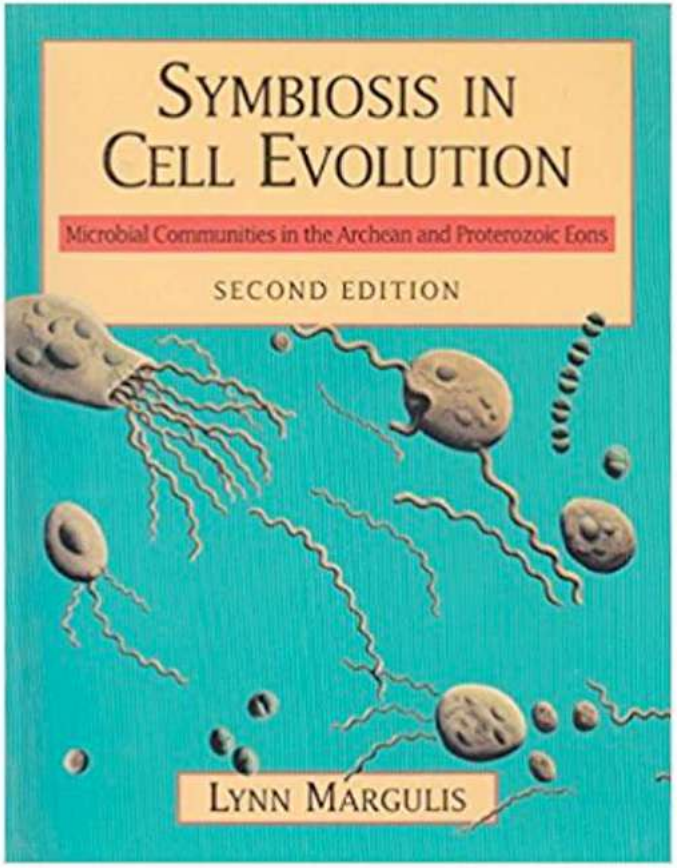

chromoide
gal−
gal+
gal− + gal+
genome
new
space-time-action
episome

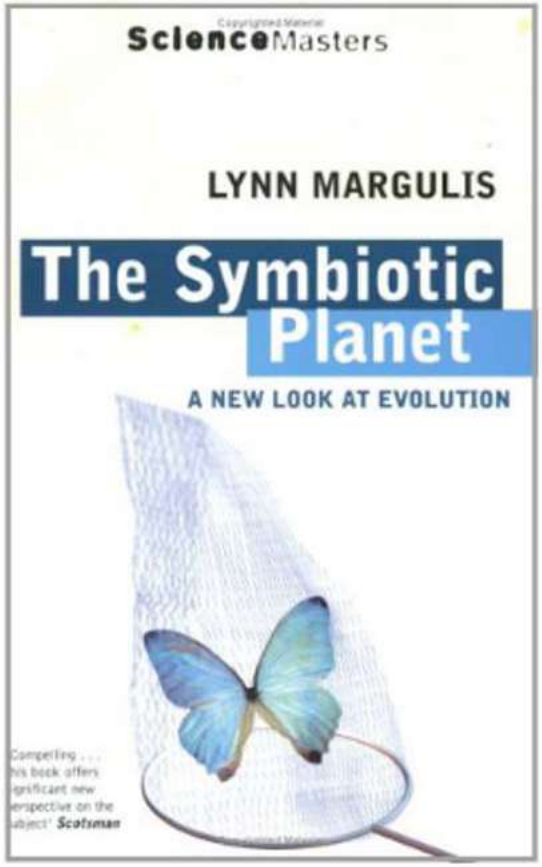

gal⁻
monère
proie
prédateur
gal⁺
gal⁻ + gal⁺
intégration
génome
gal⁺
nouvel
espace-temps-action



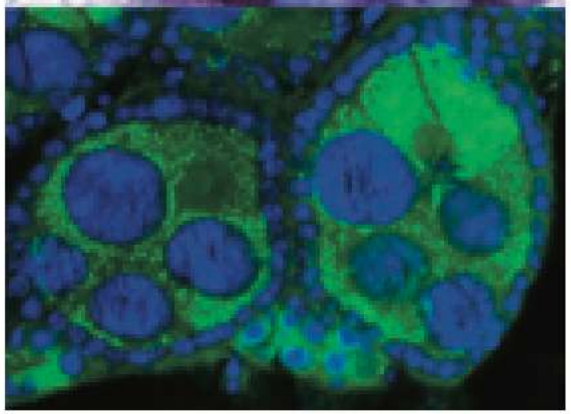
Qui PERD... GAGNE !

to escape *the "who wins loses" game*
living systems-of-systems developed symbioses





http://www.afscet.asso.fr/pagesperso/Bricage.html



Symbiose et cohabitation
Symbiosis and cohabitation

25 avril 2017 de 9h30 à 17h00
Grande salle des séances Institut de France
23, quai de Conti, 75006 Paris

Les interactions symbiotiques sont beaucoup plus répandues que ce que l'on pensait jusqu'à récemment. Ce qui était souvent considéré comme une simple cohabitation d'un organisme supérieur avec des microorganismes commensaux se trouve être une véritable association à bénéfices réciproques, avec échanges multiples de signaux entre partenaires. L'essor de la métagénomique et de la biologie cellulaire permet maintenant une analyse beaucoup plus détaillée de ces interactions. Le principal modèle de symbiose étudié au niveau moléculaire a été l'interaction entre légumineuses et la bactérie *Sinorhizobium* qui aide la plante à fixer l'azote atmosphérique. De nombreuses autres symbioses sont maintenant à l'étude.

www.academie-sciences.fr

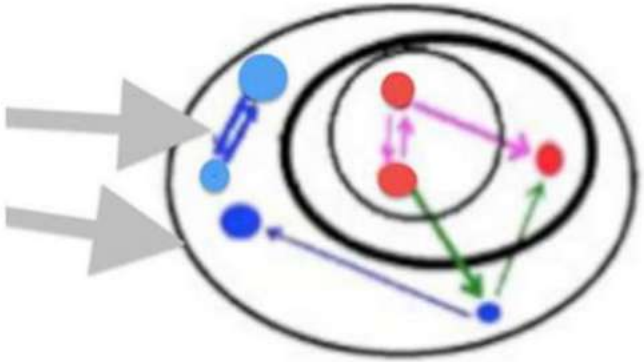
a lichen
AN ORGANISM MADE OF
A MULTICELL ORGANISM
A CELL ORGANISM POPULATION
A BACTERIAL POPULATION

DISADVANTAGE ADVANTAGE

AN ECOSYSTEM
WITH A FOOD CHAIN

ARMSADA

Association for
the **R**eciprocal
and **M**utual
Sharing of
Advantages
and Dis**A**dvantages



a lichen
AN ORGANISM MADE OF
A MULTICELL ORGANISM
A CELL ORGANISM POPULATION
A BACTERIAL POPULATION

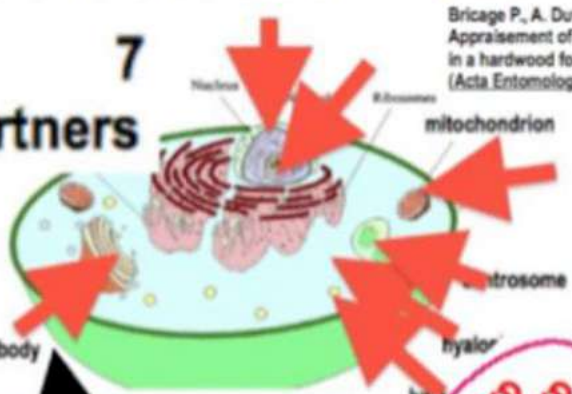
EVOLUTION -PROOF

PATENTED

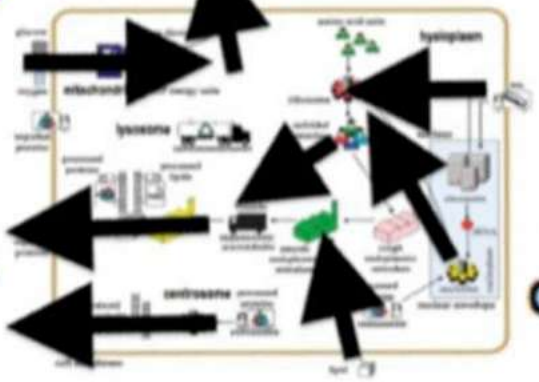
AN ECOSYSTEM
WITH A FOOD CHAIN

a cell
AN ORGANISM MADE OF
POPULATIONS OF DIFFERENT
BACTERIAL ORGANISMS SPECIES

7
partners



TESTED CERTIFIED



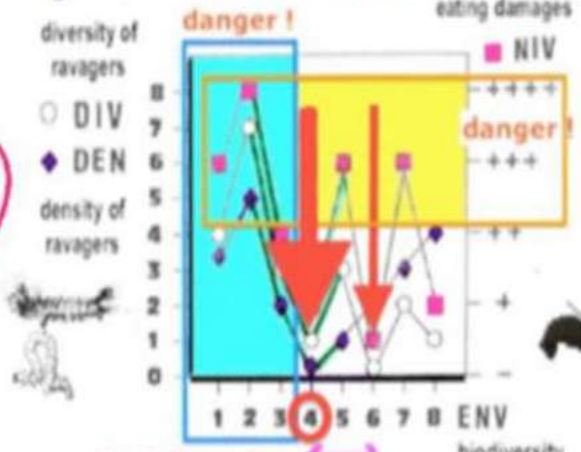
food
chains

AN ECOSYSTEM OF INTERACTIVE
RECYCLING WASTE PRODUCTS FOOD CHAINS

a forest
AN ORGANISM MADE OF
POPULATIONS OF DIFFERENT
MULTICELL ORGANISMS SPECIES

Bricage P., A. Duverger-Nedellec & D. Larroche (1990)
Appraisement of the defoliator Lepidoptera associations
in a hardwood forest. Ikartzaleak 13: 5-26.
(Acta Entomologica Vasconae 1)

quite
partners a little



NOT
too
much

2 islands
of stability

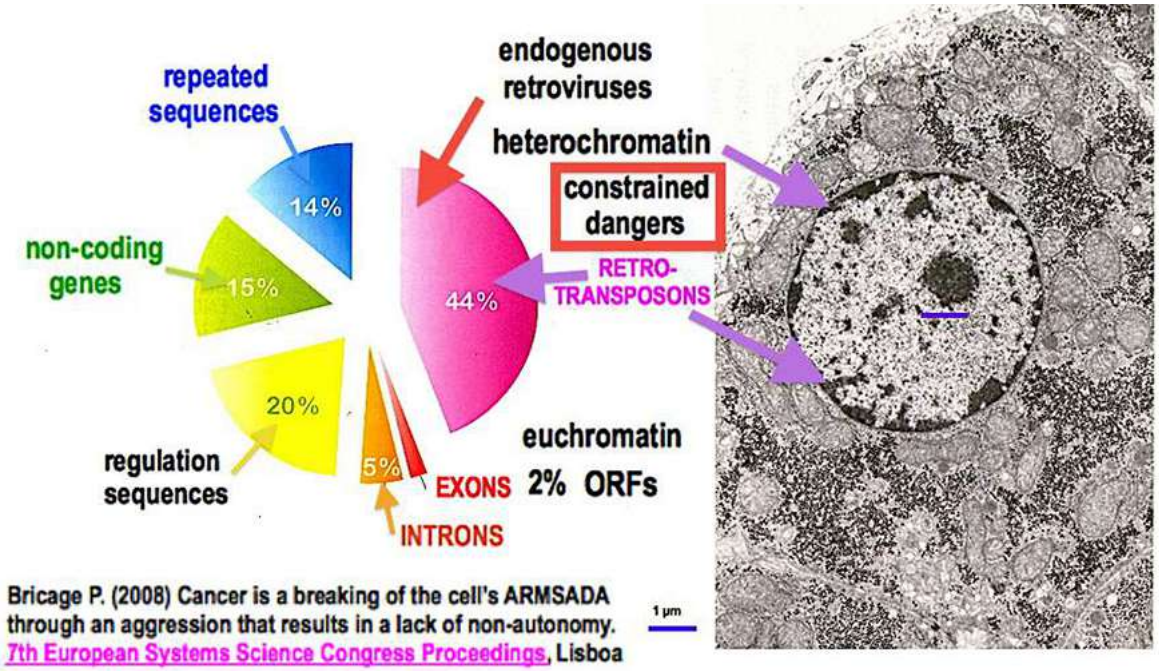
requisite
variety

partners

AN ECOSYSTEM
OF ECOSYSTEMS

1991

2.2. CELL: GENOMES CONSTRAINED DANGERS AND CANCERISATION



Bricage P. (2008) Cancer is a breaking of the cell's ARMSADA through an aggression that results in a lack of non-autonomy. 7th European Systems Science Congress Proceedings, Lisboa

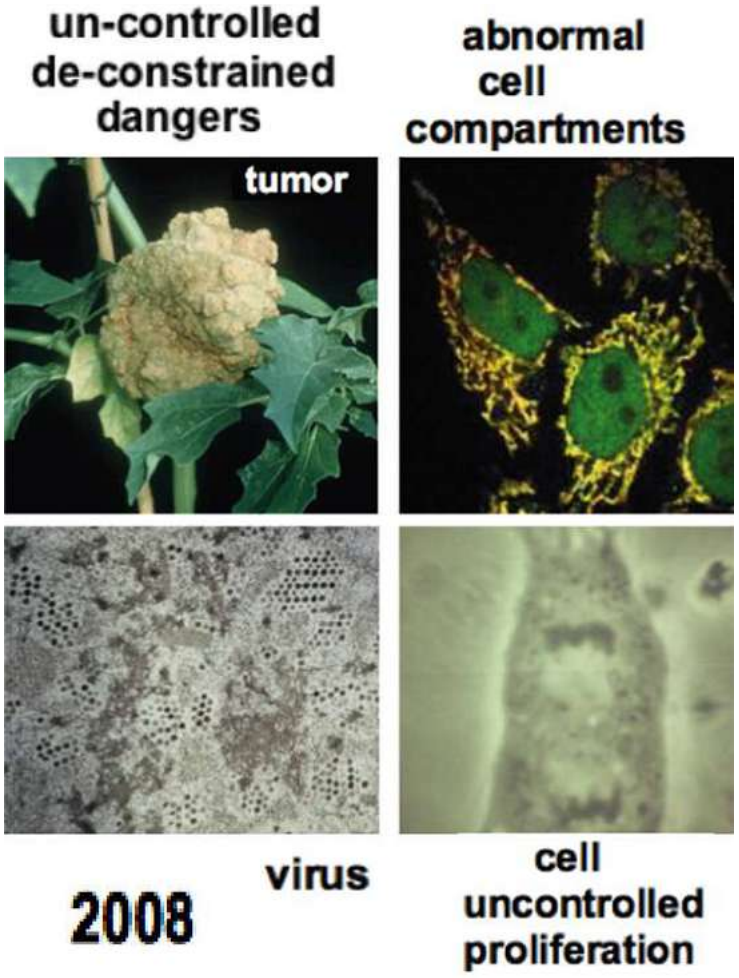
THE DECONTROLLED PROLIFERATION OF CANCER CELLS IS THE RESULT OF THEIR LACK OF NON-AUTONOMY. HEALTHY CELLS CANNOT SURVIVE IF THEY ARE FREED. CANCER CELLS CANNOT SURVIVE IF THEY ARE NOT FREE.

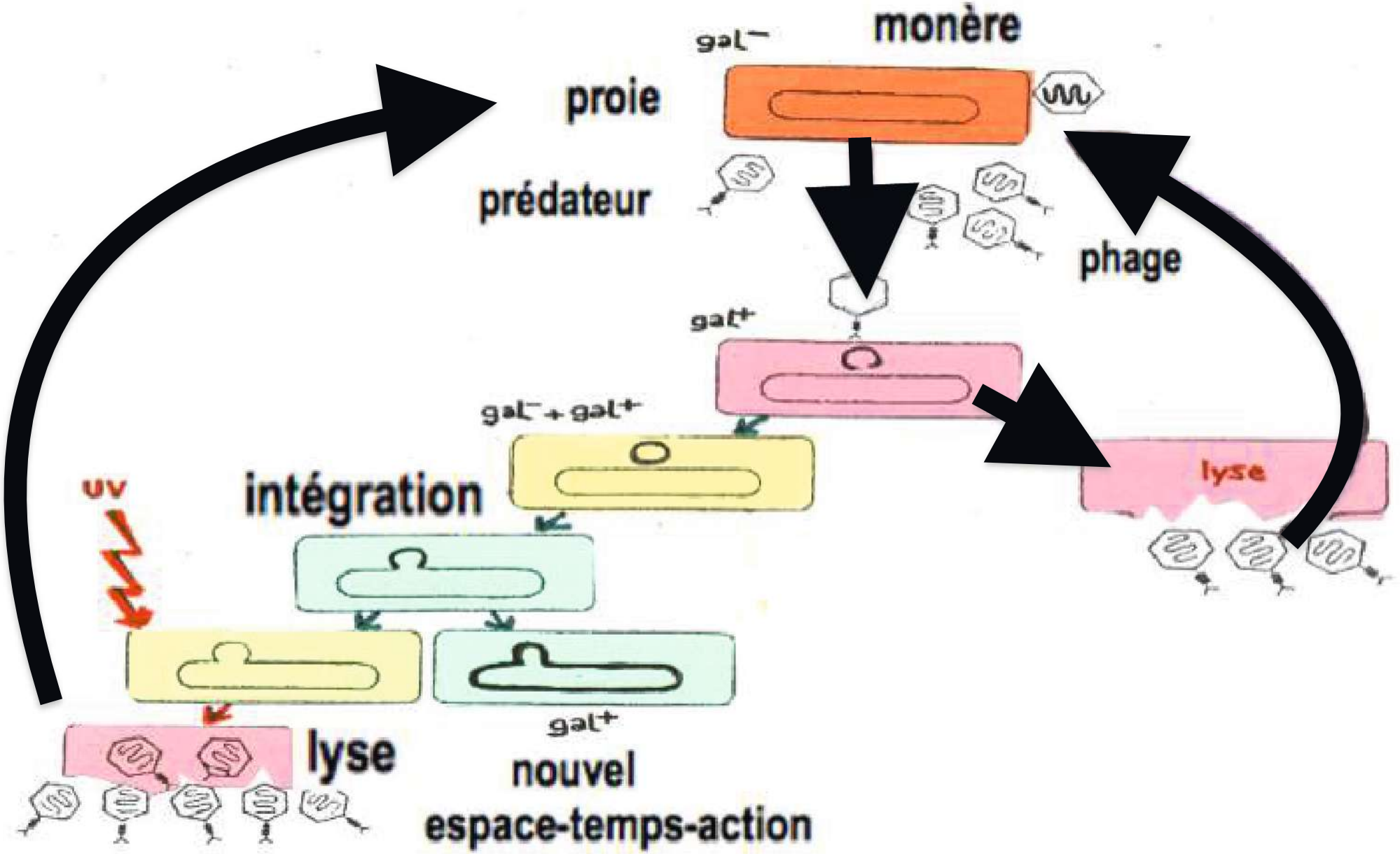
AUTONOMOUS CANCER CELLS MIGRATE AND INVADE ALL THE ORGANISM WHICH IS THEIR ECOEXOTOPE OF SURVIVAL.

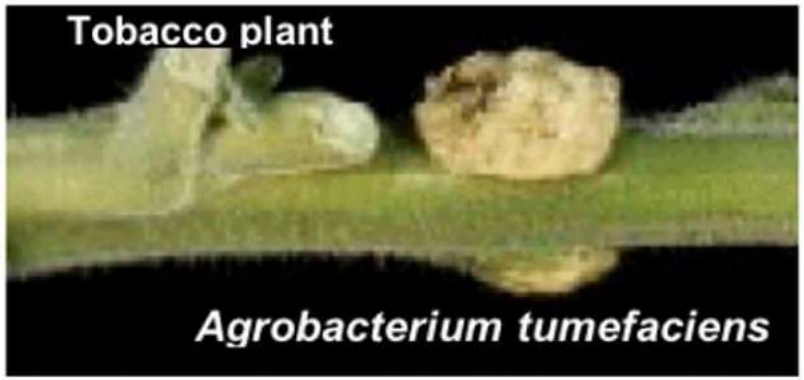
WHAT ARE CANCER CELLS?

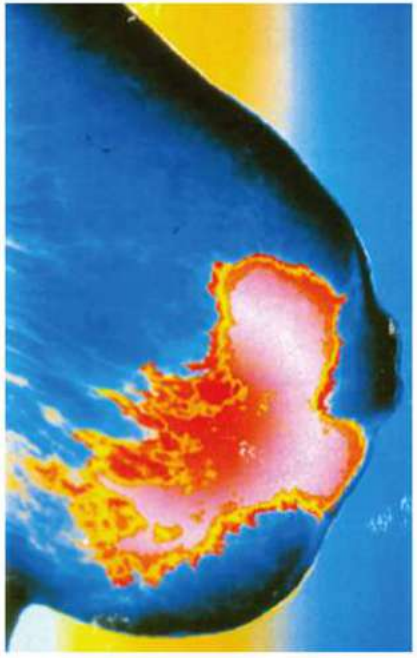
THEY ARE CELLS THAT SHOULD HAVE DIE BUT THAT DID NOT. AND THE ONLY WAY FOR THEM TO SURVIVE WAS TO BECOME CANCER CELLS THROUGH A RETROGRESSION PROCESS.

Isbn: 978-972-9059-05-6




gal⁻
monère
proie
prédateur
phage
gal⁺
gal⁻ + gal⁺
lyse
intégration
UV
gal⁺
lyse
nouvel
espace-temps-action





Breastfeeding protects against cancer

Schulte A.M. & A. Wellstein (1998) Structure and Phylogenetic Analysis of an Endogenous Retrovirus Inserted into the Human Growth Factor Gene Pleiotrophin. J. Virol. 72(7): 6065-6072.

Lapuk A. & al. (1999) A human endogenous retrovirus-like (HERV) LTR formed more than 10 million years ago due to an insertion of HERV-H LTR into the 5' LTR of HERV-K is situated on human chromosomes 10, 19 and Y. J. Gen. Virol. 80(4): 835-839.

Bindra A. & al. (2007) Search for DNA of exogenous mouse mammary tumor virus-related virus in human breast CANCER samples. J Gen Virol 88: 1806-1809.

Frank O. & al. (2008) Variable Transcriptional Activity of Endogenous Retroviruses in Human Breast CANCER. J. Virol. 82(4): 1808-1818.

Lindbo J.A. & al. (1993) Induction of a Highly Specific Antiviral State in Transgenic Plants: Implications for Regulation of Gene Expression and Virus Resistance. Plant Cell 5(12): 1749-1759.

Waterhouse P. M. & al. (1999) Virus resistance and gene silencing: killing the messenger. Trends in Plant Science 4(11): 452-457.

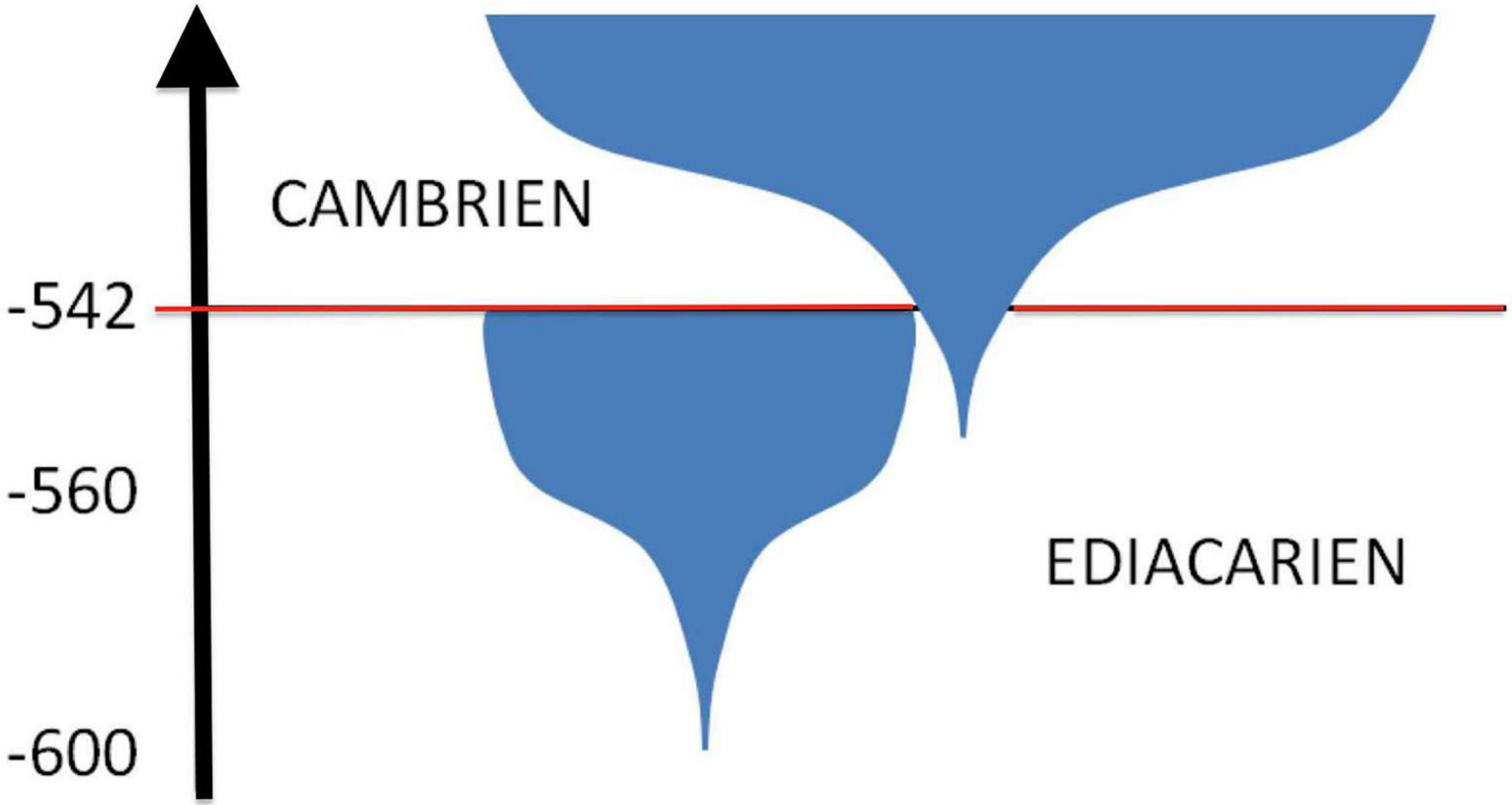
Mette M.F. & al. (2002) Endogenous viral sequences and their potential contribution to heritable virus resistance in plants. E.M.B.O. J. 21(3): 461-469.

→ SURVIVRE c'est "MANGER et NE PAS ÊTRE MANGÉ",
tôt ou tard il est IMPOSSIBLE DE NE PAS ÊTRE MANGÉ !

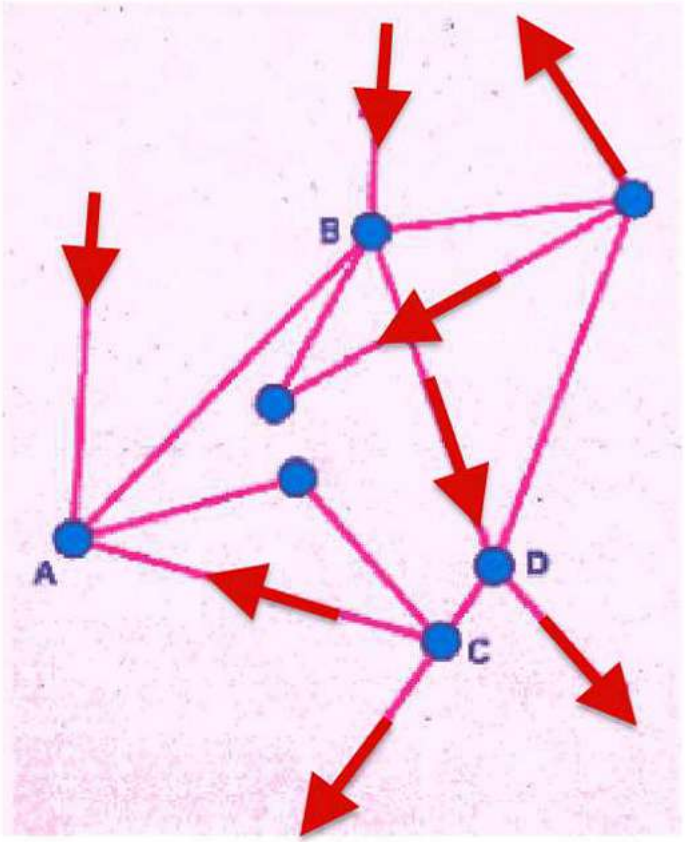
→ JAMAIS il n'y a d'AVANTAGES SANS INCONVÉNIENTS,
PLUS LES AVANTAGES SONT GRANDS,
PLUS LES INCONVÉNIENTS SONT GRANDS.

SURVIVRE C'EST TRANSFORMER LES INCONVÉNIENTS EN AVANTAGES
ET ÉVITER QUE LES AVANTAGES DEVIENNENT DES INCONVÉNIENTS,
DANS CERTAINES LIMITES IMPRÉDICTIBLES.

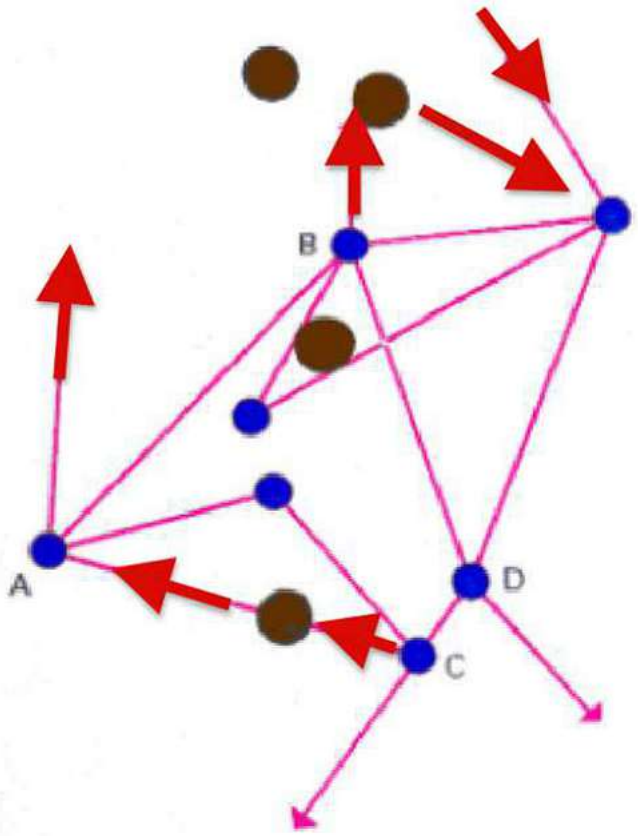
→ SEULES SURVIVENT LES ASSOCIATIONS À
AVANTAGES ET INCONVÉNIENTS RÉCIPROQUES ET PARTAGÉS


CAMBRIEN
-542
-560
-600
EDIACARIEN

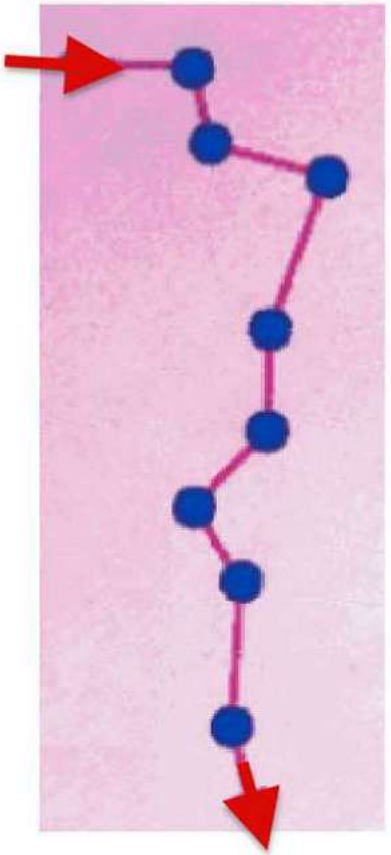
PERCOLATION



avant



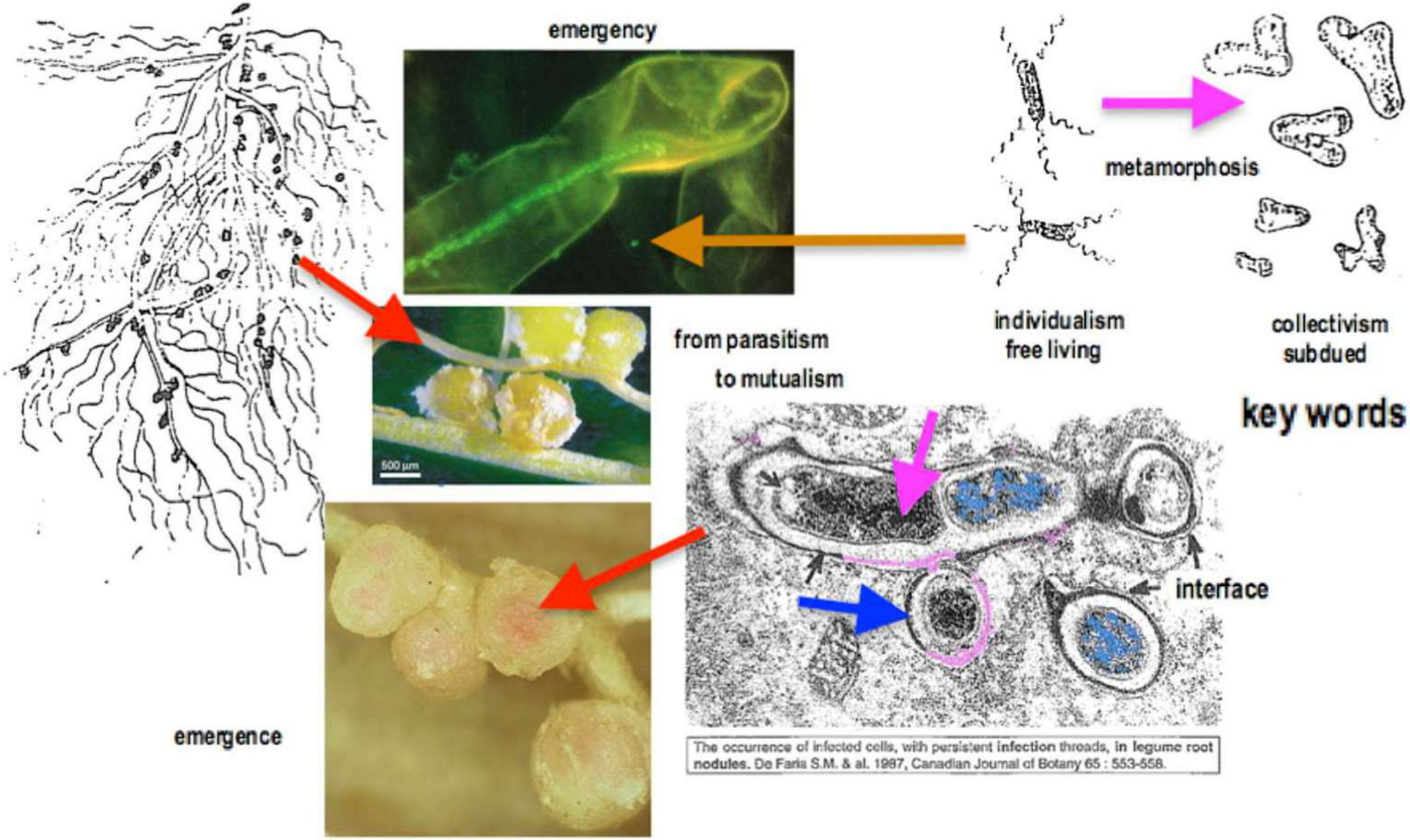
pendant



après

ISSS July 18-23, 2010, Wilfrid Laurier University, Waterloo, ON, Canada. Balancing Individualism and Collectivism Chair: Janet McIntyre

Associations for the Reciprocal and Mutual Sharing of Advantages and DisAdvantages. pierre.bricage@univ-pau.fr



The way, to be resilient and self-sustainable, the living systems run through. Pierre BRICAGE

There are never advantages without disadvantages !

To survive that is

to avoid advantages turn to disadvantages and

to transform disadvantages into advantages.

To survive that is

→ **to eat and not to be eaten**

'to be lucky !' :

'to be at the right place at the right time'

and not to be at the wrong place at the wrong time' !

International Journal of Public and Private Management

Vol 1, No 1 (2014) > **Bricage**

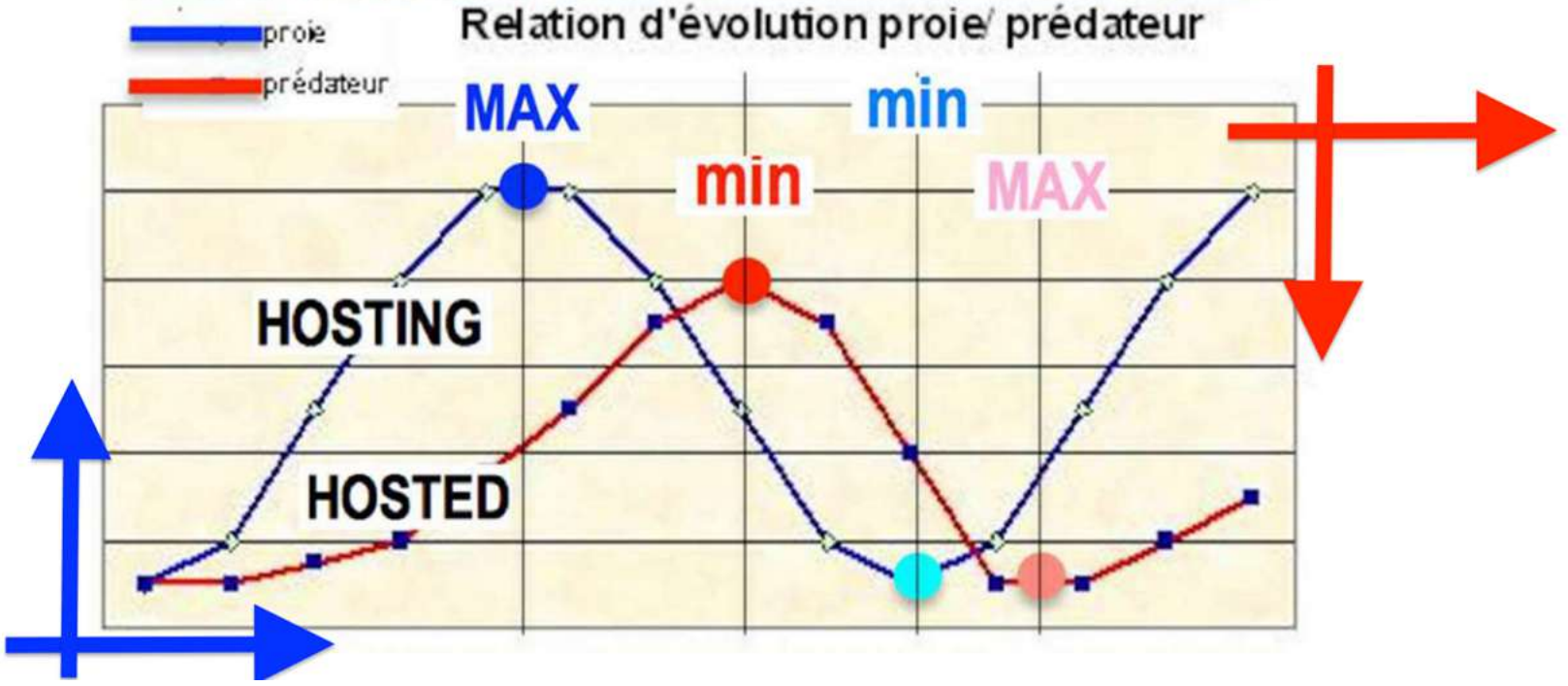
An approach of organizations and management: Systemic ethics, democracy and sustainability

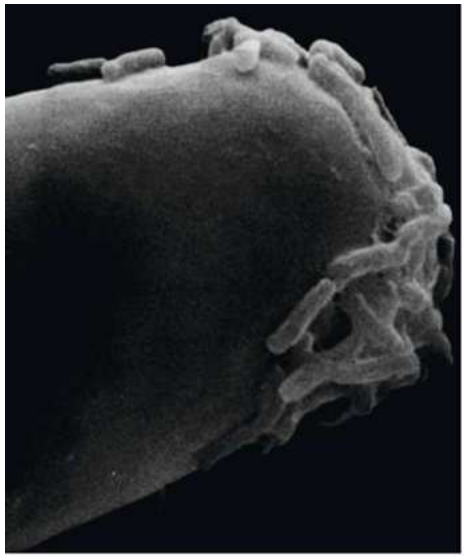
Pierre Bricage

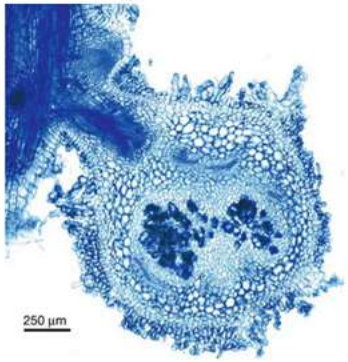
To survive all living systems have **"to eat and not to be eaten"**. But, soon or late, every one is eaten (http://tinyurl.com/surviepbafscet). To partly escape from the dilemma of the predator-prey game, in which **"who wins loses"**, the predator must, as the prey, enter into an **A**ssociation for the **R**eciprocal and **M**utual **S**haring of **A**dvantages and **D**is**A**dvantages (ARMSADA) -like a lichen or a cell, which both are an organism and an ecosystem-. Every ARMSADA emerges when all partners simultaneously lose the ability to kill the others. In the new Whole everything which is an advantage for a partner is a disadvantage for the others (http://tinyurl.com/pbsustdev). They are merged together "for the best and for the worst". "The benefits are only for their Wholeness" which get new "abilities" (http://tinyurl.com/andesymbiosis) -like the cell, which, with the help of a virus, emerged from a mat of Monera (http://tinyurl.com/pbcellorigin). In their new endophysiotope the **"Parceners"** are all interdependent. Through the iteration of the process of ARMSADAs' emerging, each new more-and-more complex "system-of-systems" is more-and-more independent of its ecoexotope (http://tinyurl.com/phylotagmotaphology). The endophysiotope of a i level of organisation is the ecoexotope of previous i-n levels. Due to the parceners half-autonomy, abilities of the previous levels are lost while simultaneously new ones are gained: **"The Whole is both less and more than the sum of its parts"**(http://tinyurl.com/anlea05pau).

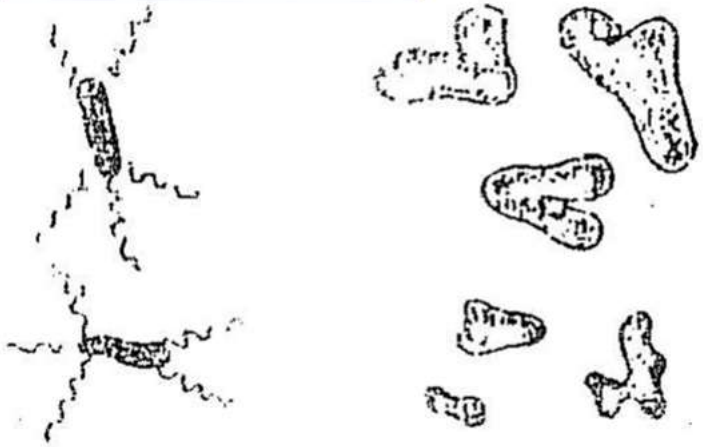
BALANCING individualism/merging individualities into collective neo-individualism, the process of ARMSADA rising has allowed the EMERGENCE of new life forms. This **"only one way"** of evolution allows the EXAPTATION of new endophysiotopes more-and-more independent of their previous ecoexotopes. There are never advantages without disadvantages. "To survive that is to turn disadvantages into advantages and to avoid turning advantages into disadvantages." From the simplicity of the Monera to the complexity of the cell and the hyper-complexity of the lichen, the blueprint of each new system-of-systems has preserved the ancient footprints of the previous life forms. The life gauge invariance explains the scaling invariance of growth processes, the Law of which is independent of the organisations levels. The ecological, economical, educational or societal artefacts of the Man endangered species must be built according to the way of ARMSADA: "nobody must be a permanent winner", "everybody alternatively is a winner and a loser", "transparency is necessary to allow the mutual and reciprocal sharing of advantages and disadvantages".

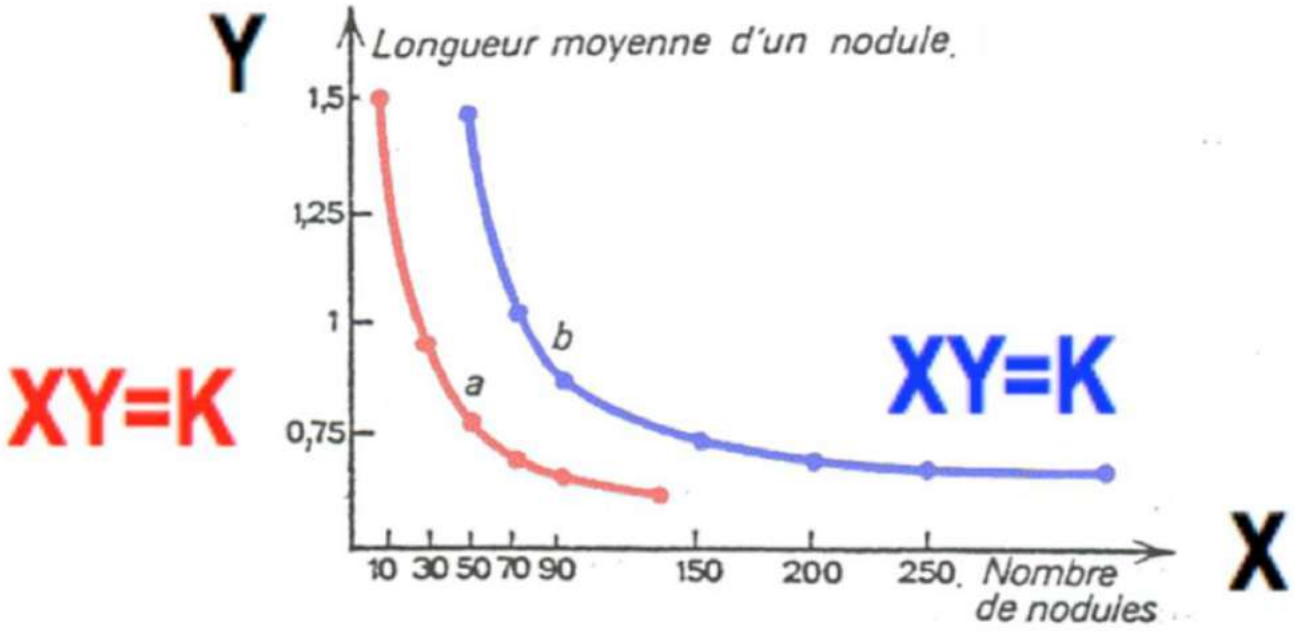
Merci


proie
prédateur
Relation d'évolution proie/ prédateur
MAX
min
min
MAX
HOSTING
HOSTED





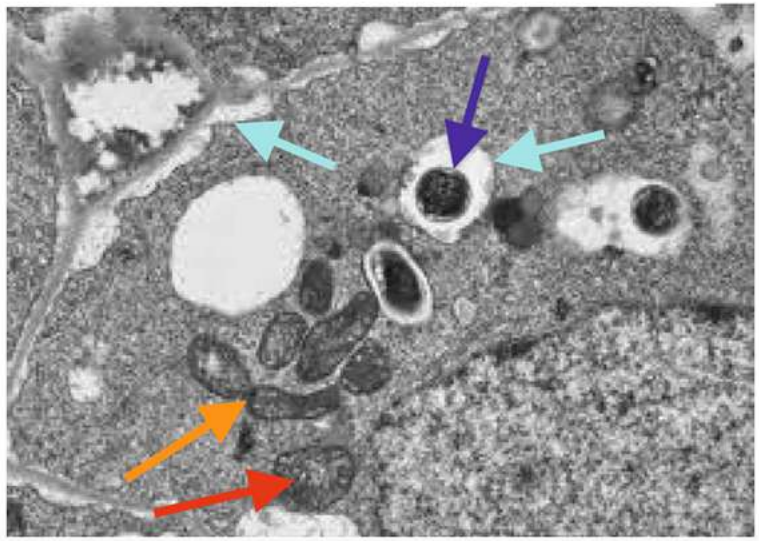


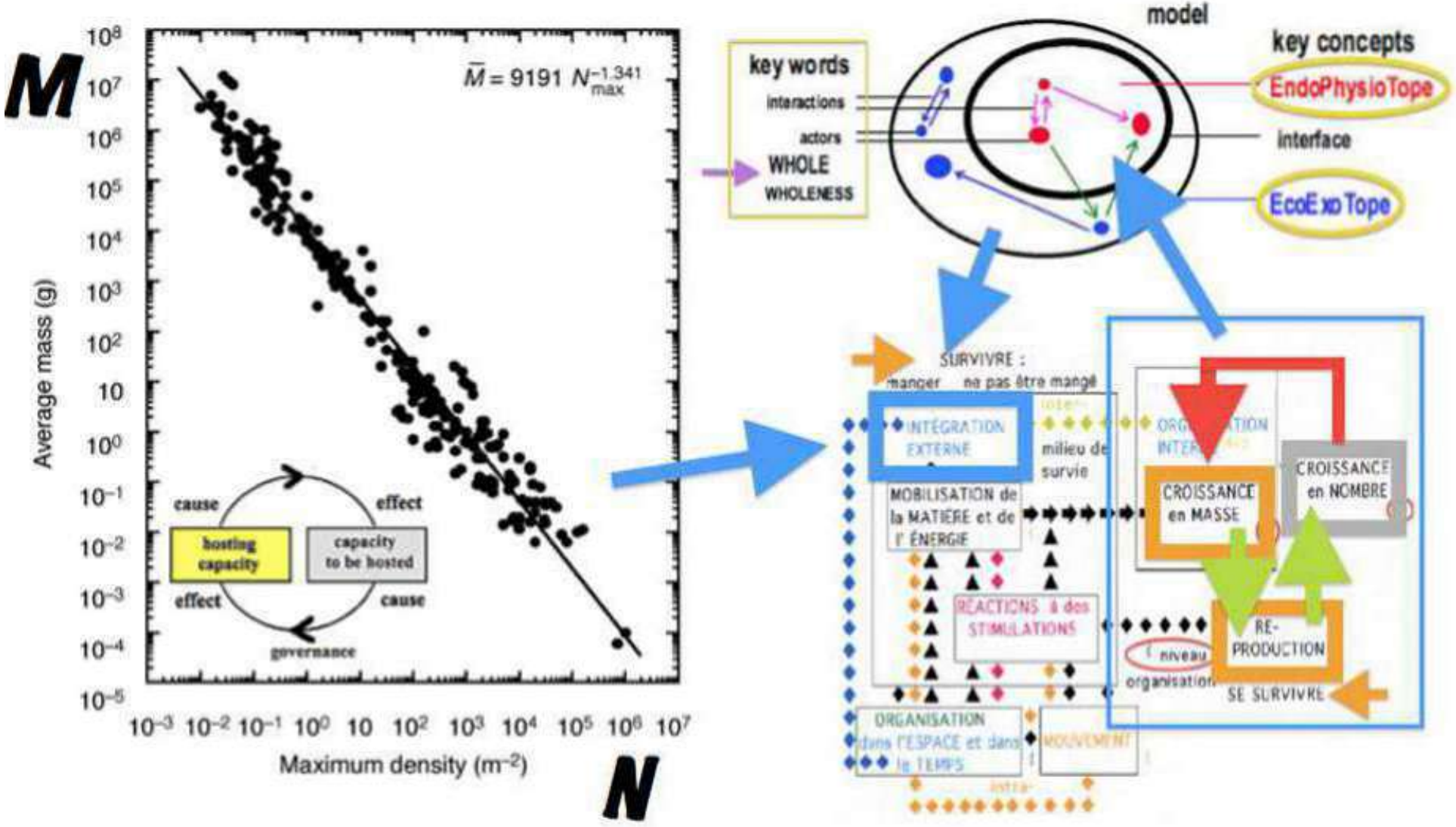


XY=K

XY=K

Relation entre la longueur moyenne d'un nodule (en mm) et le nombre de nodules par plante, chez deux variétés de *Trifolium subterraneum*

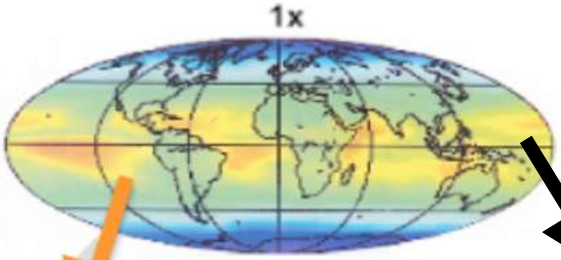



M
$\bar{M} = 9191\ N_{max}^{-1.341}$
Average mass (g)
Maximum density (m^{-2})
N
cause
effect
hosting capacity
capacity to be hosted
effect
cause
governance
model
key words
interactions
actors
WHOLE
WHOLENESS
key concepts
EndoPhysioTope
interface
EcoExoTope
SURVIVRE :
manger
ne pas être mangé
INTÉGRATION EXTERNE
milieu de survie
MOBILISATION de la MATIÈRE et de l'ÉNERGIE
CROISSANCE en MASSE
CROISSANCE en NOMBRE
RÉACTIONS à des STIMULATIONS
RE-PRODUCTION
niveau
organisation
SE SURVIVRE
ORGANISATION dans l'ESPACE et dans le TEMPS
MOUVEMENT

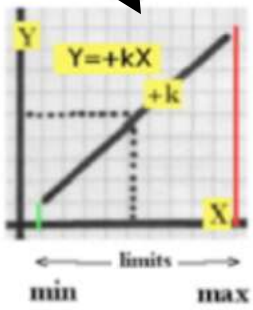
EcoExoTope & EndoPhysioTope

all the water of the earth

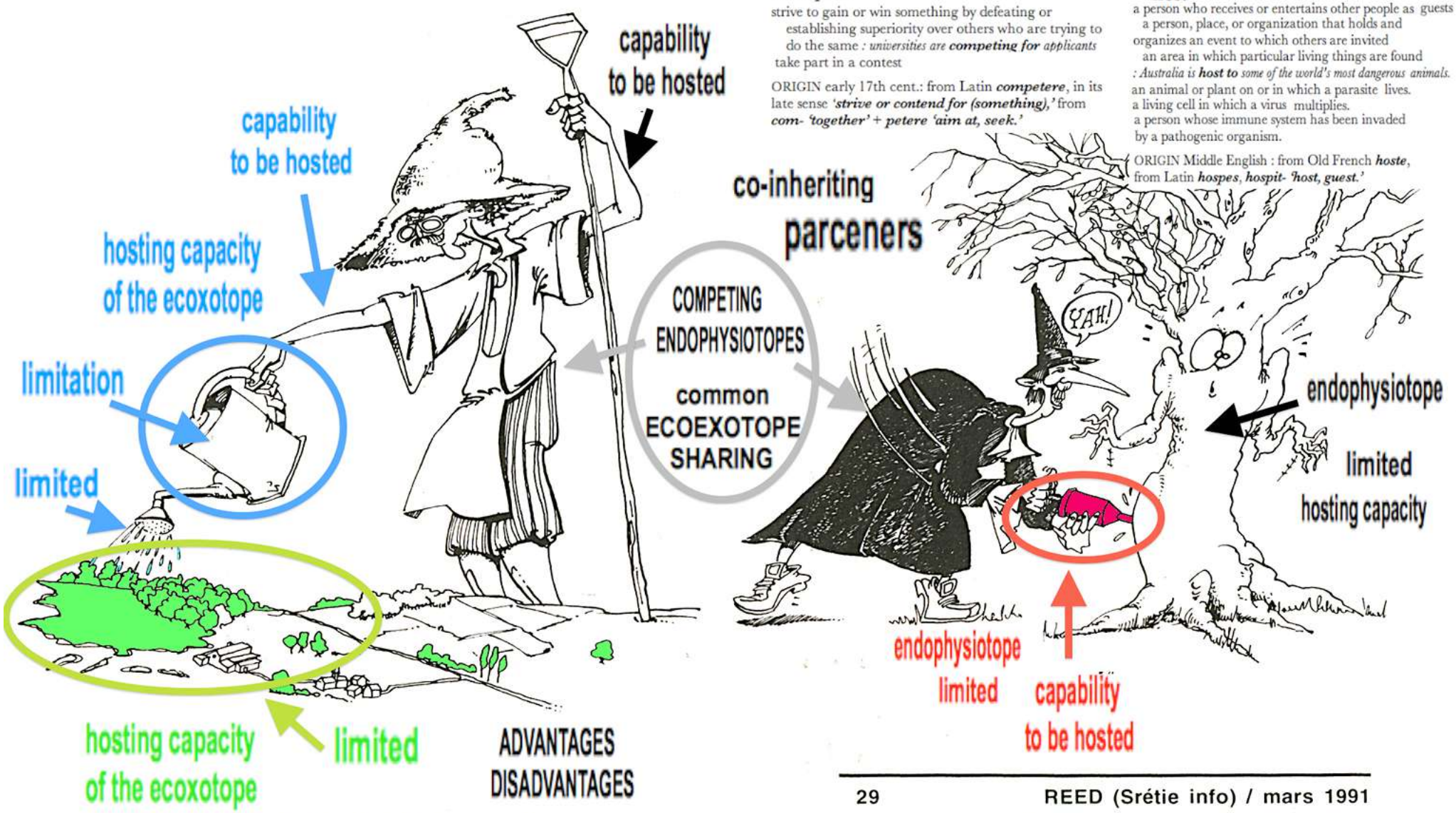
Limitations



hosting capacity



capacity to be hosted



com•pete

strive to gain or win something by defeating or establishing superiority over others who are trying to do the same : *universities are* ***competing for*** *applicants*
take part in a contest

ORIGIN early 17th cent.: from Latin ***competere***, in its late sense ***'strive or contend for (something),'*** from ***com- 'together' + petere 'aim at, seek.'***

host

a person who receives or entertains other people as guests
a person, place, or organization that holds and organizes an event to which others are invited
an area in which particular living things are found
: *Australia is* ***host to*** *some of the world's most dangerous animals.*
an animal or plant on or in which a parasite lives.
a living cell in which a virus multiplies.
a person whose immune system has been invaded by a pathogenic organism.

ORIGIN Middle English : from Old French ***hoste***, from Latin ***hospes, hospit- 'host, guest.'***

applicative insights in prevention

www.afscet.asso.fr/resSystemica/Lisboa08/bricage2.pdf

by P BRICAGE

Dec 19, 2008 - AIDS is the result of the limiting "hosting capacity" of the human and of the unlimited "**capacity to be hosted**" of the virus'

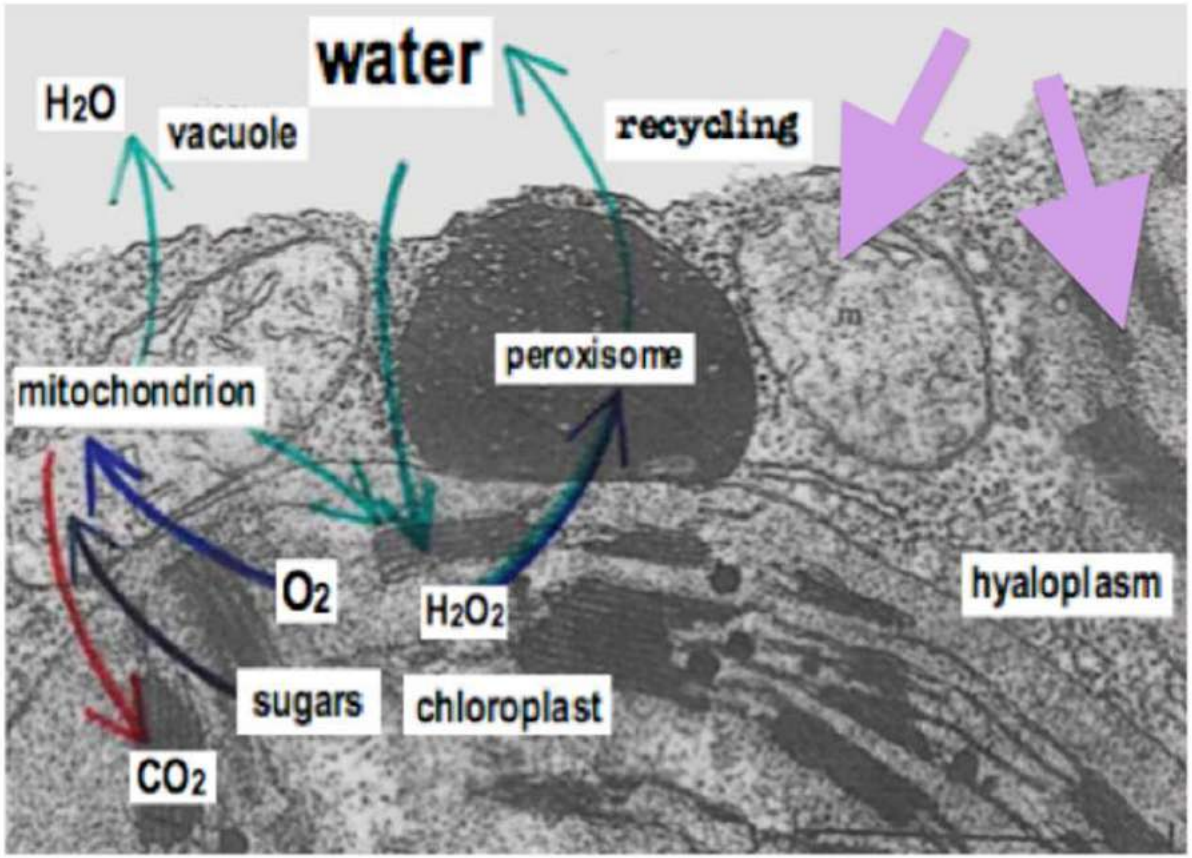
ARMSADA

www.armsada.eu/files/pbSystemicEthics.pdf

by P BRICAGE

Nov 12, 2011 - Hosting Capacity of an Ecoexotope/**Capacity to be Hosted** of an Endophysiotope. 1b. Boundaries, Biosphere, Emergence: Evolutionary ...

A CELL IS AN ENDOSYNCENOSIS, AN ECOSYSTEM of ORGANISMS

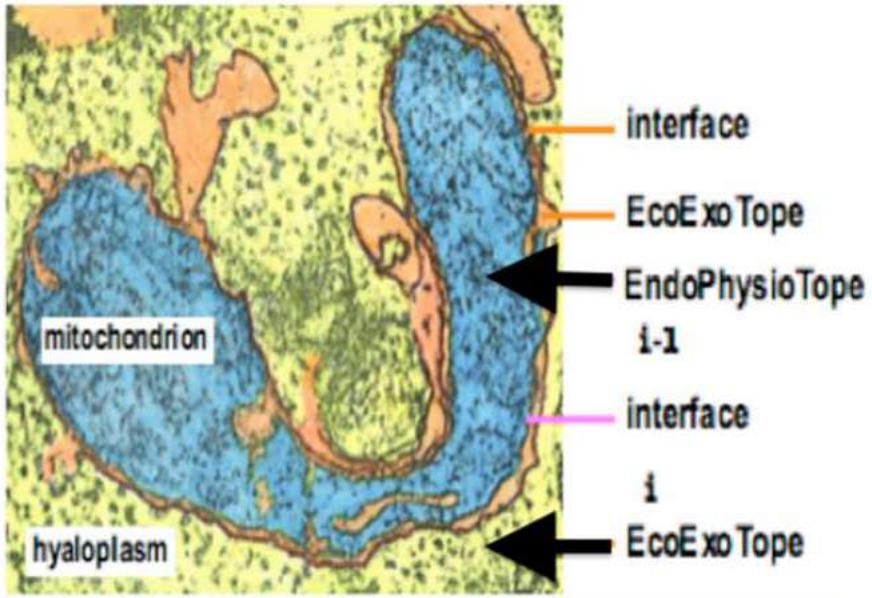


E PLURIBUS UNUM

IN VARIETATE CONCORDIA

UNUS PRO OMNIBUS OMNES PRO UNO

UN POUR TOUS TOUS POUR UN

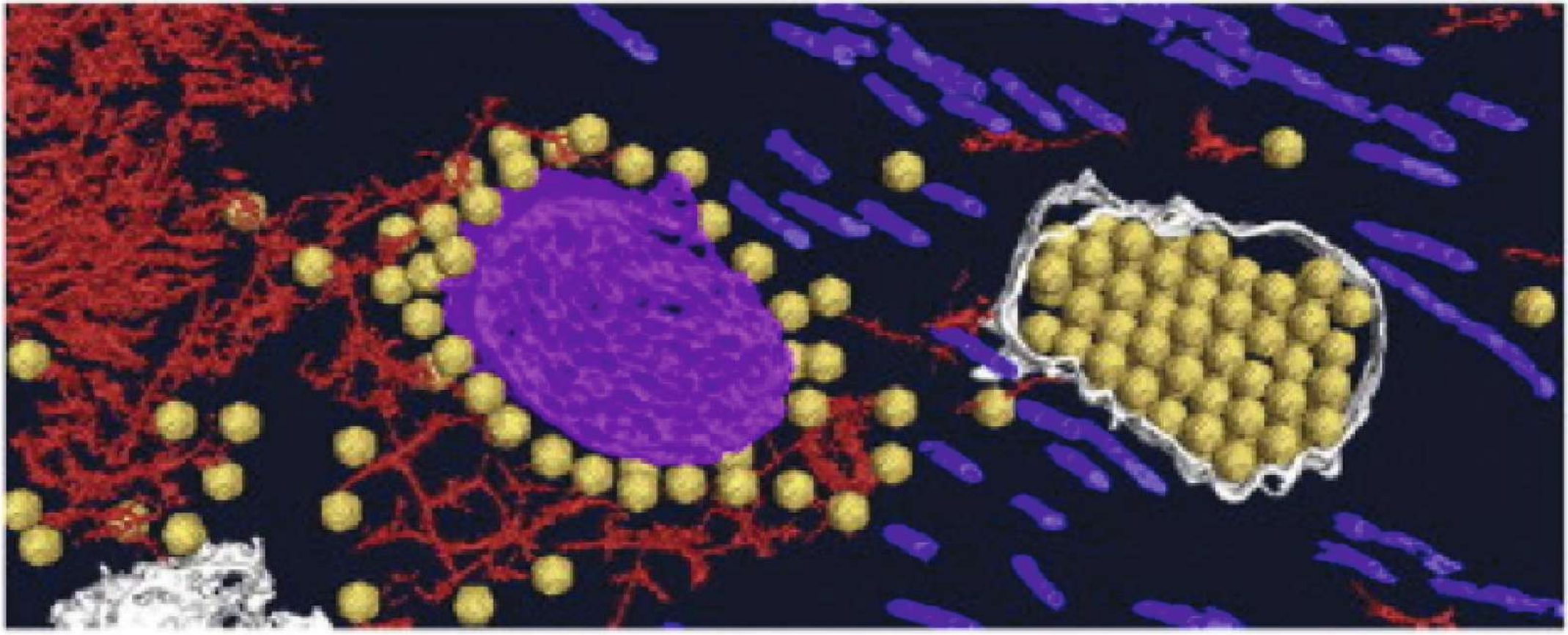


Bricage P. (1986) Isoperoxidases, markers of surrounding and physiological changes, in situ in leaves and in vitro in calli of *Pedilanthus tithymaloides L. variegatus*: cell compartmentation and polyfunctionality, control of activity by phenols, specific roles. p. 261-265. Molecular & Physiological Aspects of Plant Peroxidases, Univ. Genève, (ISBN 2-88164-001-X)

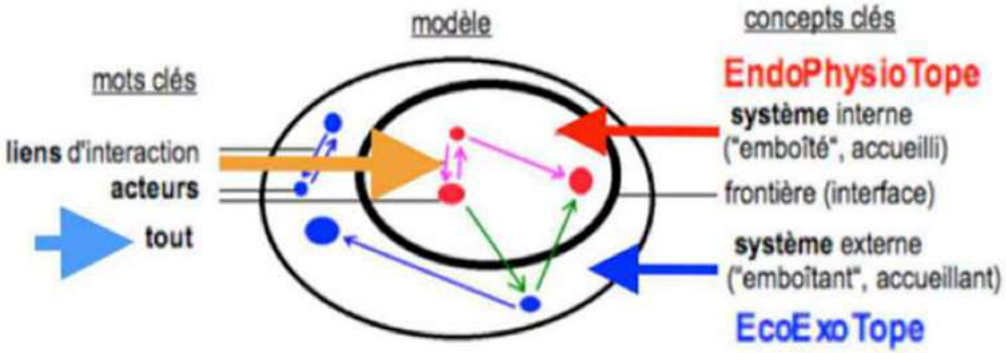
ISSS July 18-23, 2010, Wilfrid Laurier University, Waterloo, ON, Canada. Balancing Individualism and Collectivism: ARMSADA

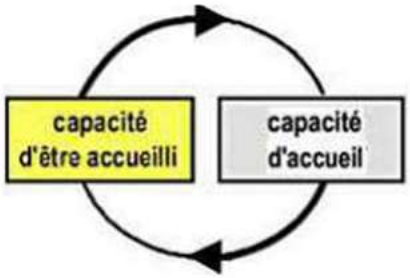
FOR THE ONE TO SURVIVE
THE OTHER ONE MUST SURVIVE FIRST
AND RECIPROCALLY 2000

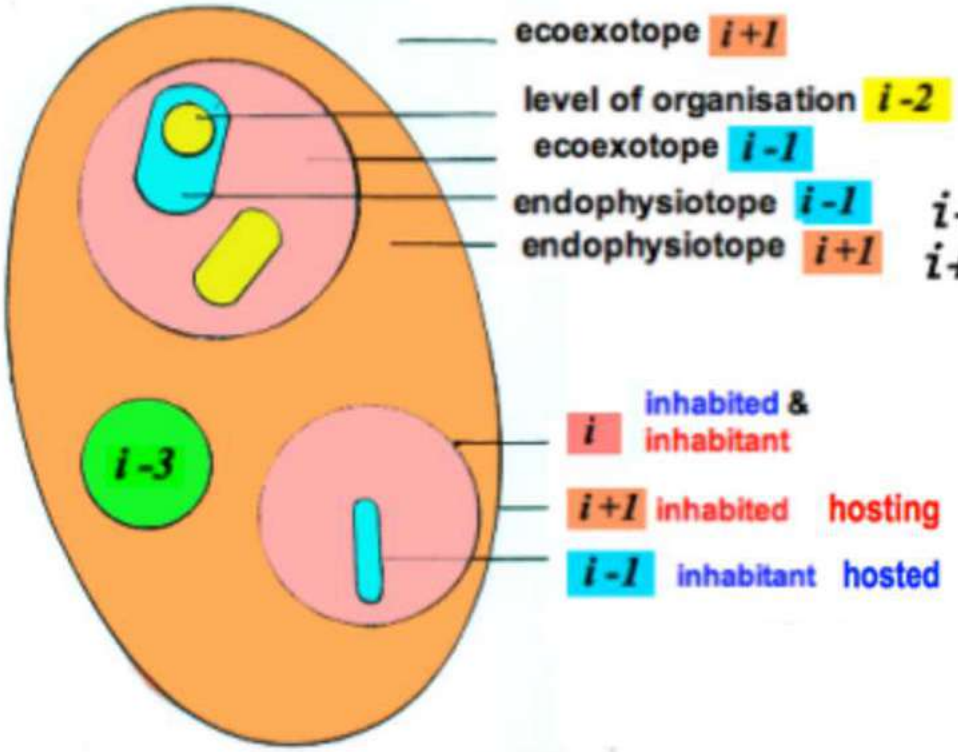
cell

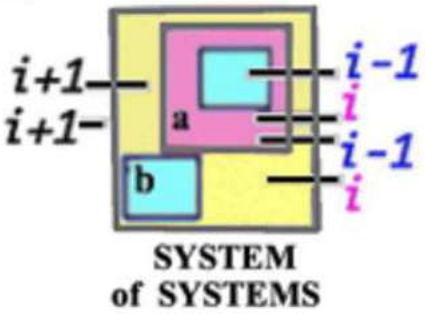


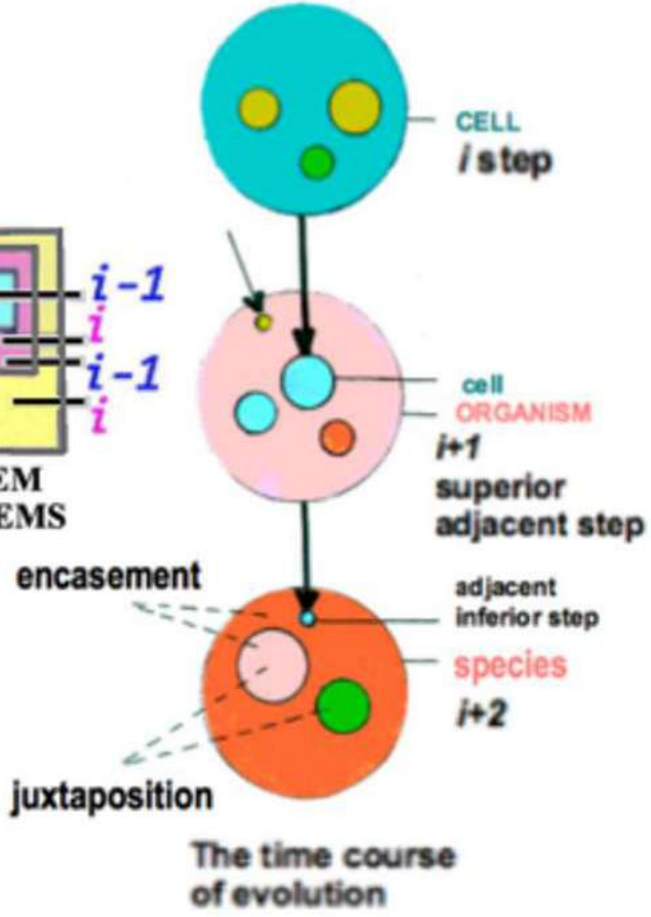
►Electron tomography revealed Rice gall dwarf virus on the surface of mitochondria. They are arrayed in an orderly but loose manner. These particles were aligned along intermediate filaments. The virus has a putative mitochondrion-targeting sequence on its outer surface.


modèle
concepts clés
mots clés
liens d'interaction
acteurs
tout
EndoPhysioTope
système interne
("emboîté", accueilli)
frontière (interface)
système externe
("emboîtant", accueillant)
EcoExoTope

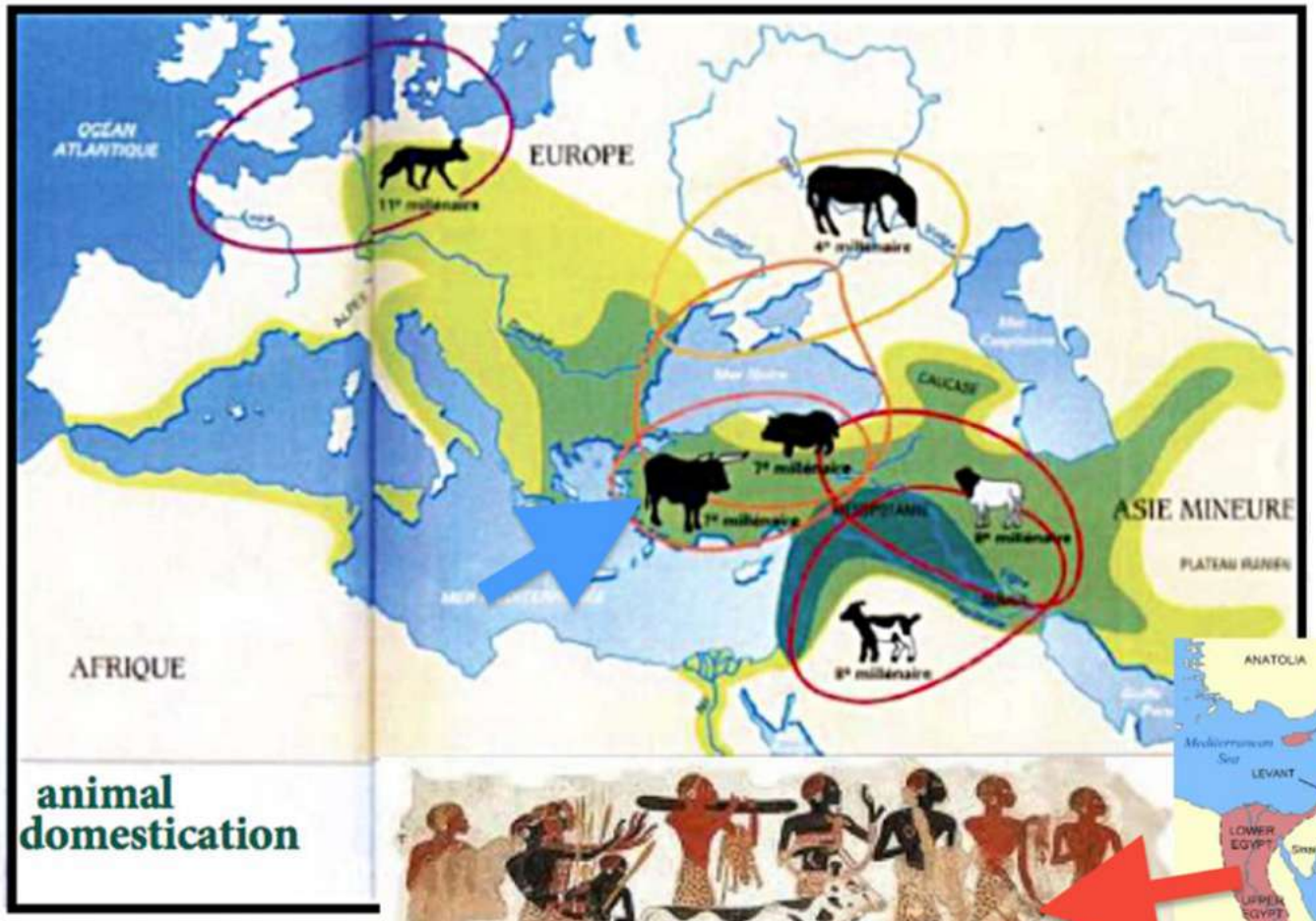

capacité
d'être accueilli
capacité
d'accueil

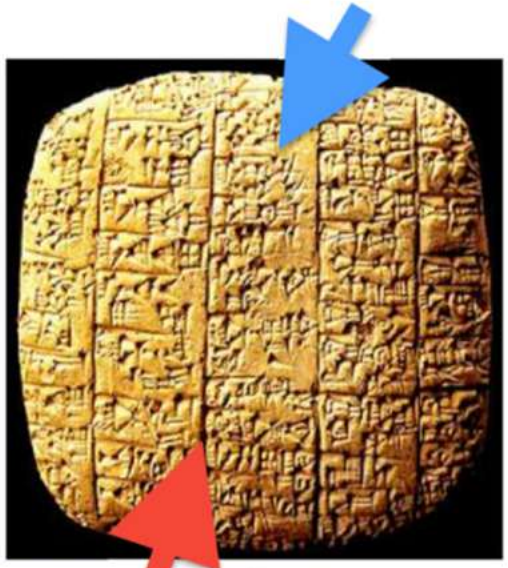

ecoexotope i+1
level of organisation i-2
ecoexotope i-1
endophysiotope i-1
endophysiotope i+1
i-3
i
inhabited &
inhabitant
i+1 inhabited hosting
i-1 inhabitant hosted


i+1
i+1
a
b
i-1
i
i-1
i
SYSTEM
of SYSTEMS


CELL
i step
cell
ORGANISM
i+1
superior
adjacent step
encasement
adjacent
inferior step
species
i+2
juxtaposition
The time course
of evolution

contrat synallagmatique





parsoniers

Inspirational Systems Change Needed.
Katri-Liisa Pulkkinenen

"You never change things by fighting the existing reality.
To change something, build a new model
that makes the existing model obsolete."

Buckminster Fuller

THAT IS EXACTLY WHAT NATURE IS DOING!

We are on obsolete model!
And maybe the new MODEL,
the new ARMSADA BLUE-PRINT is ON the way,
but today without us.

http://armsada.eu