



Berner Fachhochschule  
Haute école spécialisée bernoise  
Bern University of Applied Sciences



Montreux, sept. 20th, 2018

SGAIM SSMIG SSGIM  
Herbstkongress  
Congrès d'automne

18

Médecin durable:  
nachhaltig, zukunftsfähig, verlässlich

20. bis 21. September 2018 – 20 au 21 septembre 2018  
Montreux – Music & Convention Centre



## *Trees and Forests - their importance for the climate and human health*

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▶ Haute école spécialisée bernoise / Architecture, **Bois** et Génie civil - 2500 Bienne, Suisse

Giants of the  
plant kingdom

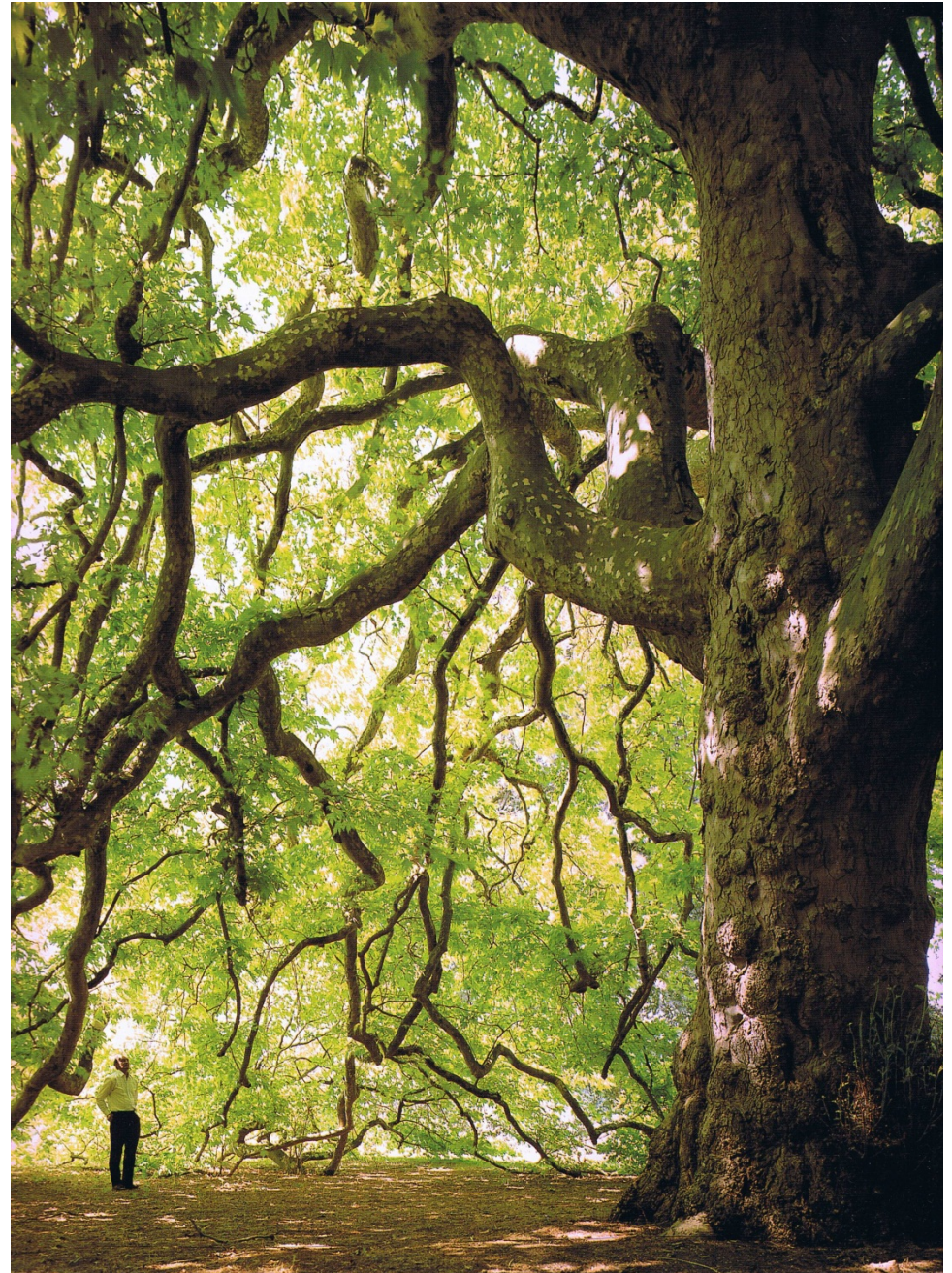



Samauma, Silk Cotton tree, Kapok tree, Kapokier *Ceiba pentandra*





**Baum und Wald:**  
Struktur und Hülle, Eigenleben,  
besondere Atmosphäre  
***Tree and Forest:***  
***Structure and envelope, proper***  
***life, specific atmosphere***

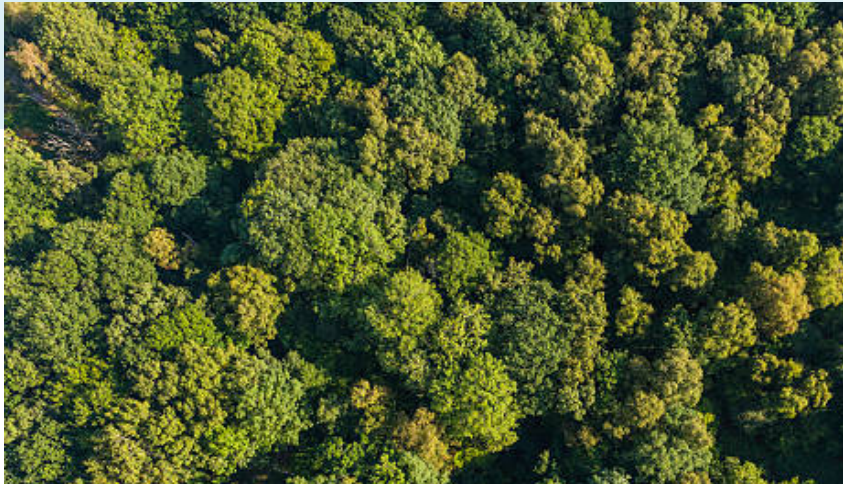




Colours  
Odours,  
Sounds,  
Tastes,  
....

# ***Trees and Forests:***

*The green and living protective layer  
of the Earth*



# Am Ursprung der Wasserzyklen

*At the origin of the water cycles*

*Photo Bruno Sirven*

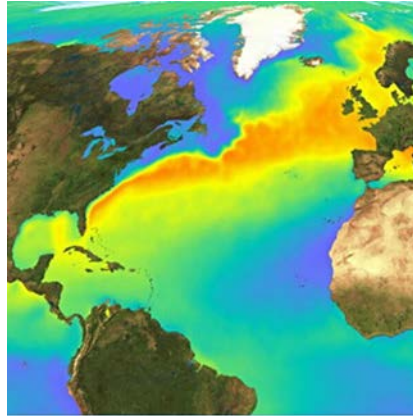
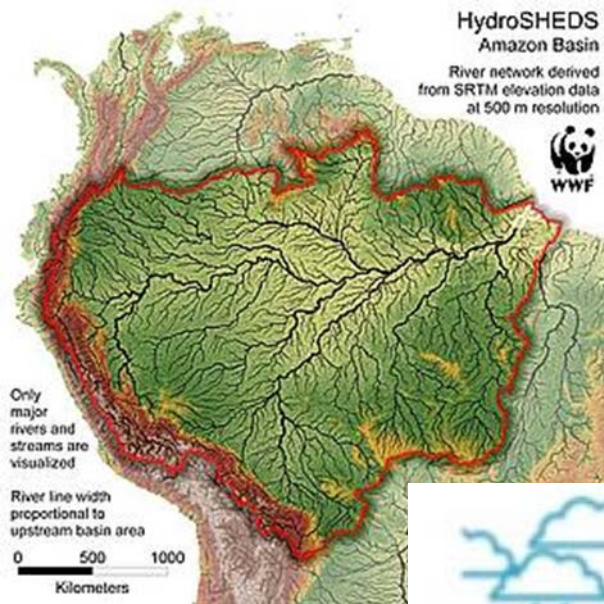


**Baum als Organ des Waldes - Wald als Organ der Erde**  
*Tree as organ of the forest - Forest as organ of the Earth*





# Das Amazonasbecken, « klimatisches Herz» der Erde, droht, zu einer Wüste zu werden

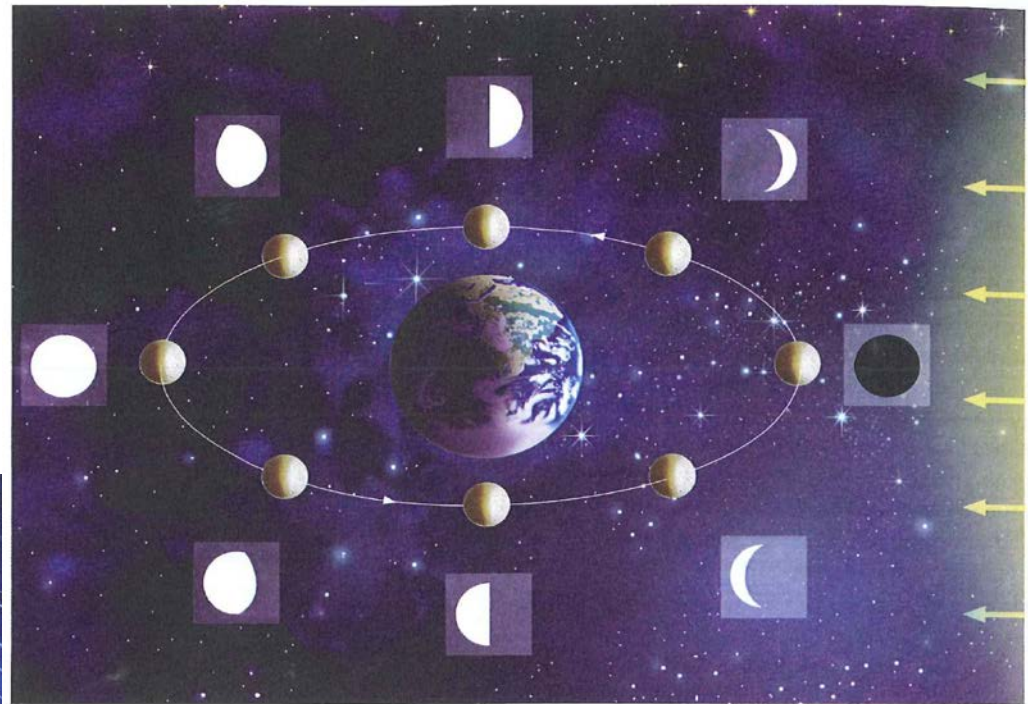


*The Amazon basin, «climatic heart » of the Earth, risks to change into a desert*



Makarieva A.M., Gorshkov V.G., Sheil D., Nobre A.D., Bunyard P., Li B.-L. (2014) Why does air passage over forest yield more rain? Examining the coupling between rainfall, pressure, and atmospheric moisture content. *Journal of Hydrometeorology*, 15, 411-426, 2014

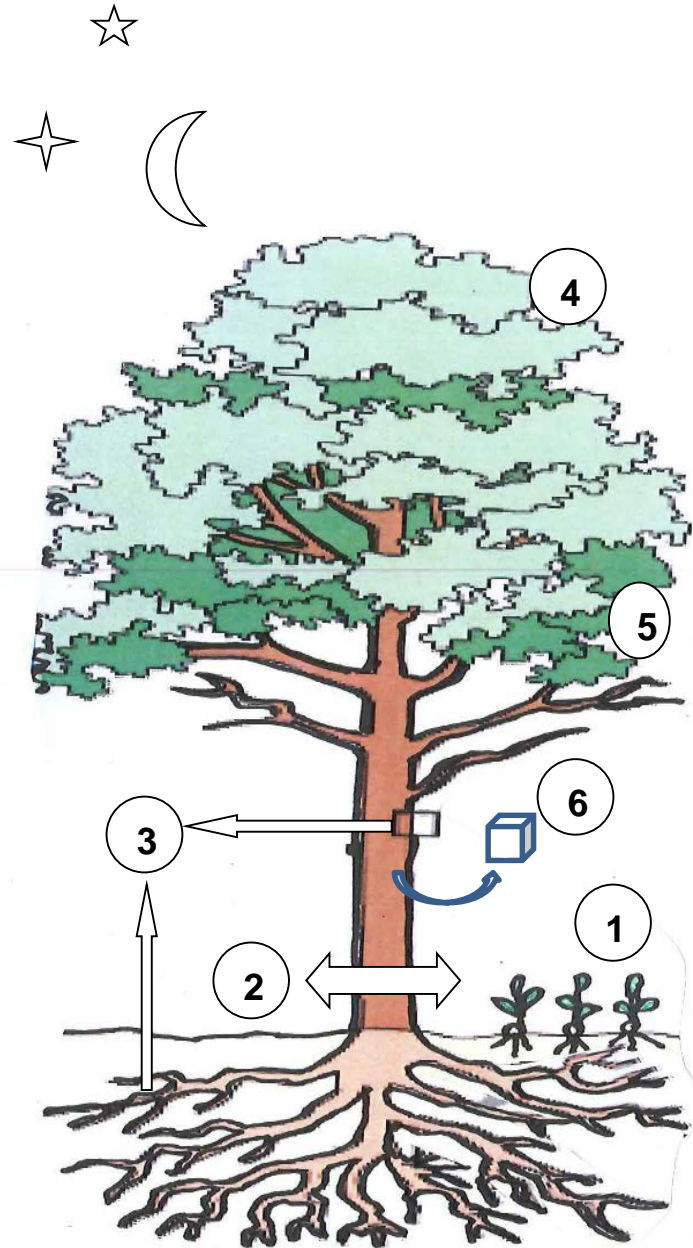
***Moon, planetary system and constelations: in addition to the Sun as chronobiological factors***



## Des rythmes en harmonie avec le cosmos

Quelques aspects :

- Germination et croissance initiale
- Variations du diamètre en phase avec les marées
- Potentiel bio-électrique au rythme des marées
- Pulsation des bourgeons
- Feuilles, aiguilles et fruits, Nombre d'Or et Système solaire
- Date d'abattage et propriétés du bois.



# Fluctuations du diamètre du fût et marées gravimétriques (E.Zürcher, M.-G.Cantiani, F.Sorbetti-Guerri, D.Michel 1998) – sur *Picea abies* et autre essences

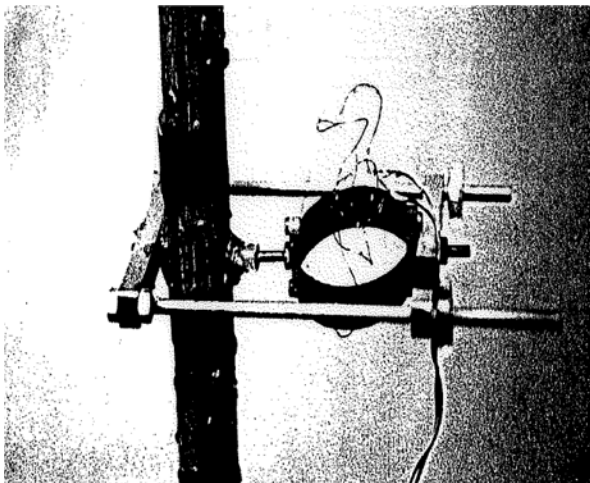


Fig. 9 Time series of  $\delta D$  (black line) recorded from a stem of *Juglans regia* during March 1991 and the contemporaneous variations of  $\delta g$  (red line)

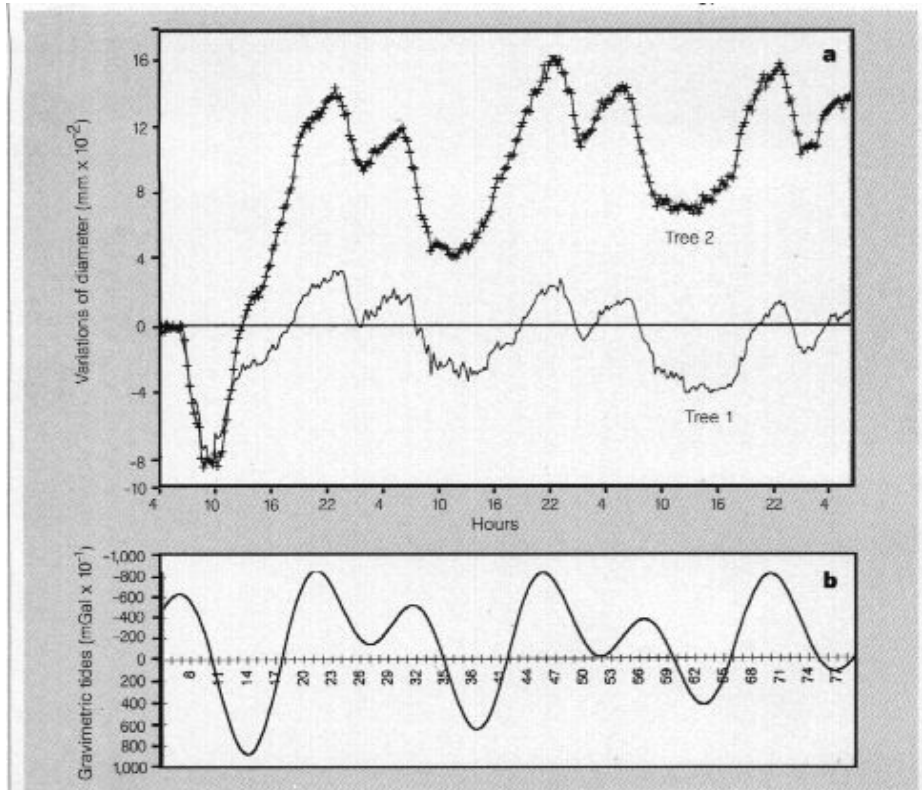
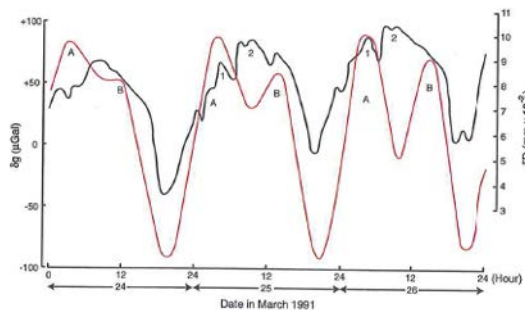
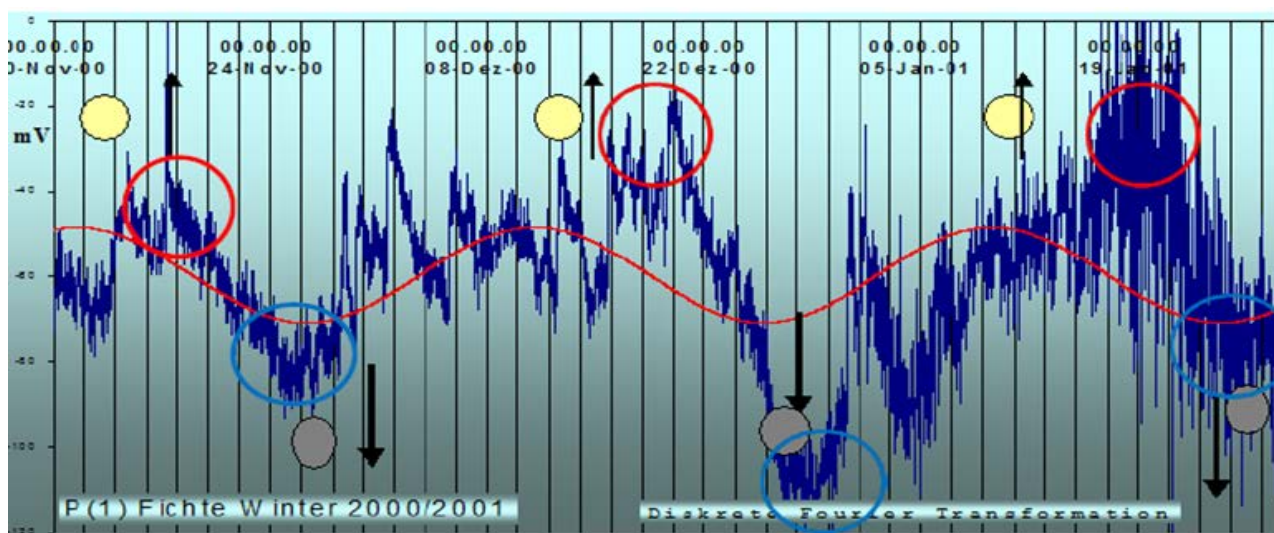
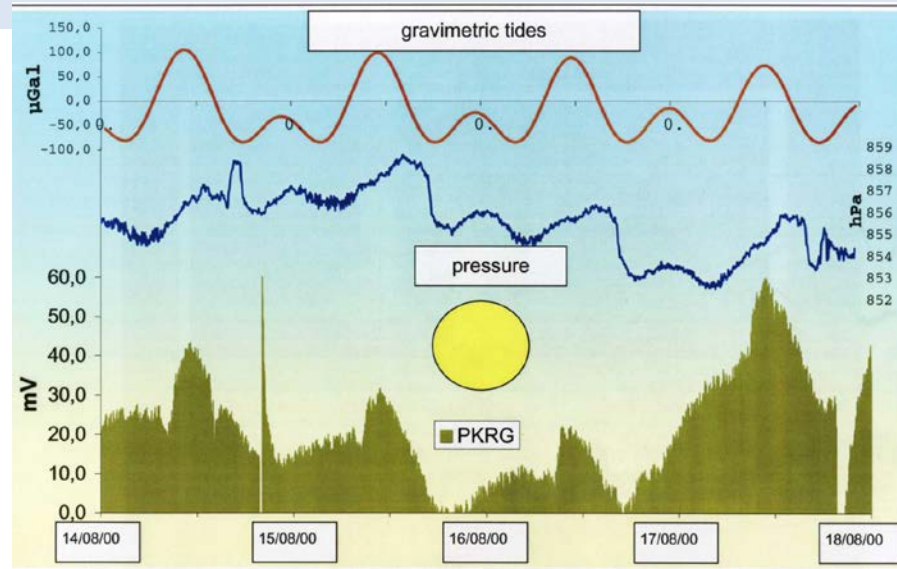


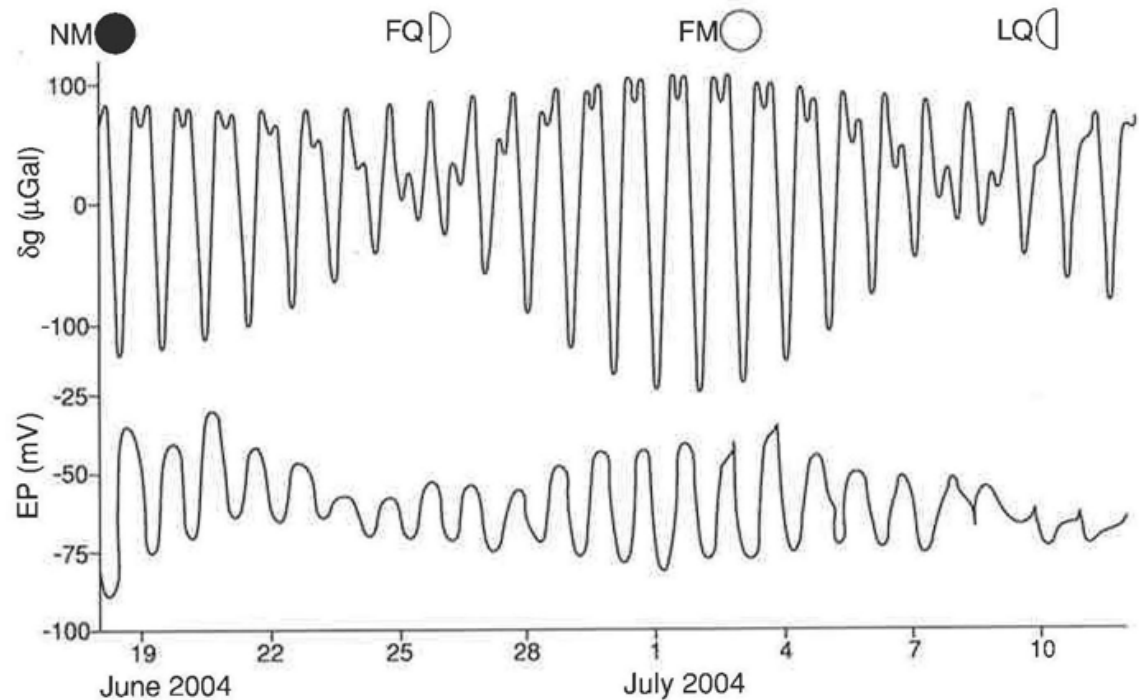
Figure 1 Reversible diameter variations in spruce and gravimetric tides. **a**, Two independent young spruce trees under conditions of constant darkness and controlled temperature show simultaneous reversible diameter variations, which are strongly correlated (synchronous) with **b**, the gravimetric curve calculated for the same place (Florence, Italy) and period (17-20 July 1988).

# Bioelectric Potentials in conifer trees

(K.Holzknrecht 2002) – with *Picea abies* and *Pinus cembra*



# *Black Poplar: circadian and monthly fluctuations of the bio-electrical potential, in function of the gravimetric tides*



**Fig. 10.8** Profiles of electrical potential (*EP*, lower panel) recorded in a tree of *Populus nigra* and of the corresponding lunisolar-derived gravimetric tidal profile ( $\delta g$ , upper panel) during 25 days of June–July 2004. Dates of new moon (*NM*), full moon (*FM*) and first and last quarter (*FQ*, *LQ*) are indicated. New moon occurs on 18 June. Data for *EP* are redrawn from Fig. 11 of Gibert et al. (2006)

# Cottonwood *Populus deltoides* / *A legacy of north american Nations*



© 2012 Kim Chayne



« Cottonwood, Red Cloud (Edgar) said this morning, does not decay and is never eaten. Its leaf is the model of our tipis and of our moccasins. **Inside we find the morning star.** »

Frithjof Schuon (1907 – 1998)

# Mathematik und Geometrie allgegenwärtig im Universum

## *Mathematics and geometry omnipresent in the Universe*

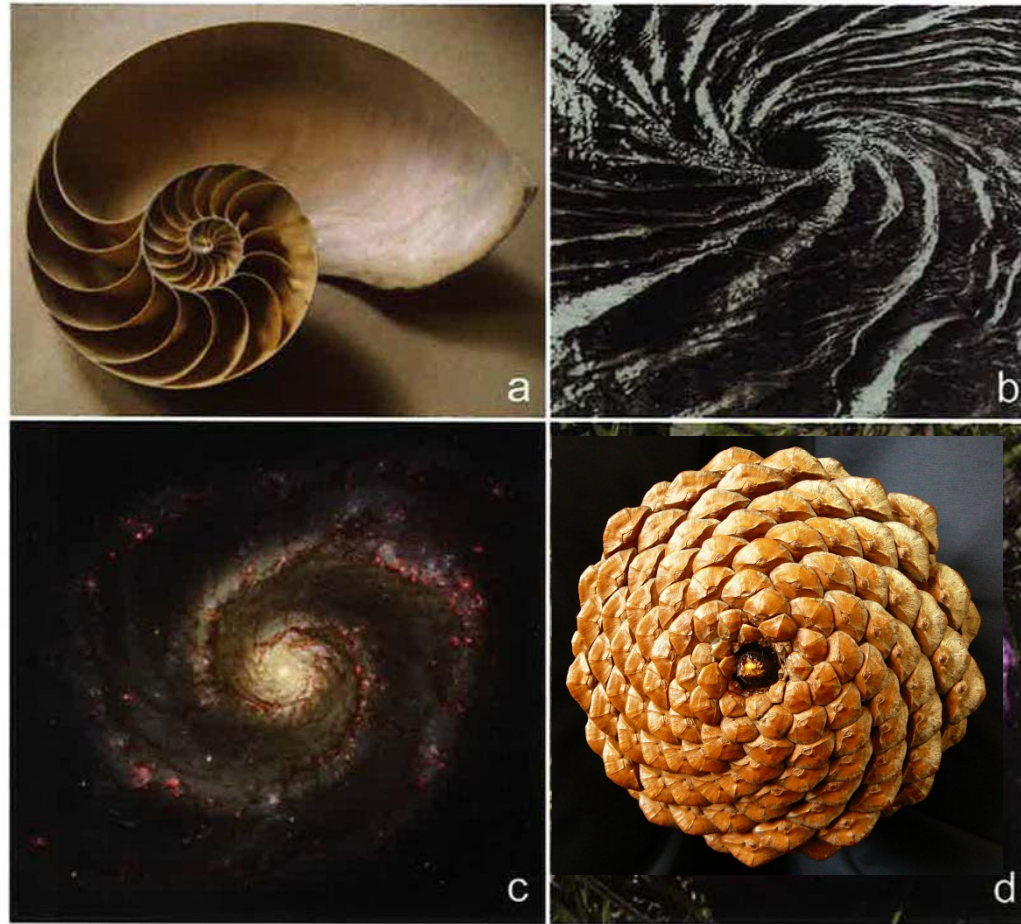


Fig. 3 *Spiral forms*: (a) in a cross-section of a shell of the chambered nautilus, *Nautilus pompilius*, a marine mollusc, showing the spiralling septa which divide the shell into chambers (when water is pumped out, the animal adjusts its buoyancy with the gas contained in the chambers); (b) water whirlpool; (c) whirlpool galaxy; (d) pine cone with spiralling bracts



# Spiralen und Goldener Schnitt bei Pflanzen

## *Spirals and Golden Section in plants*



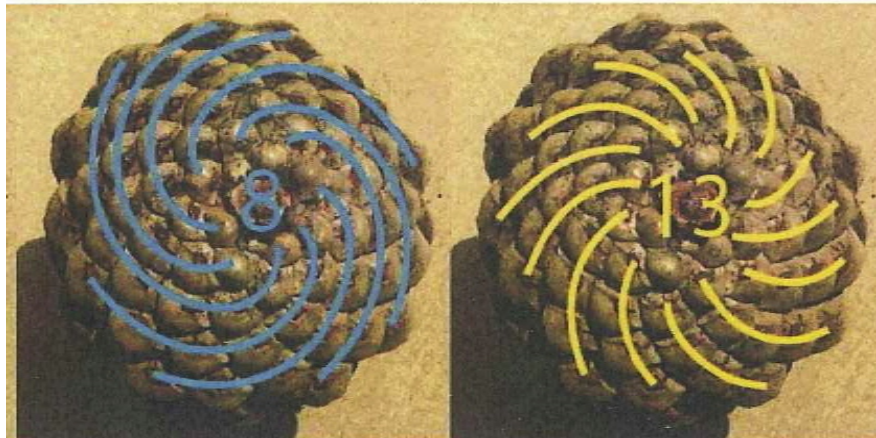
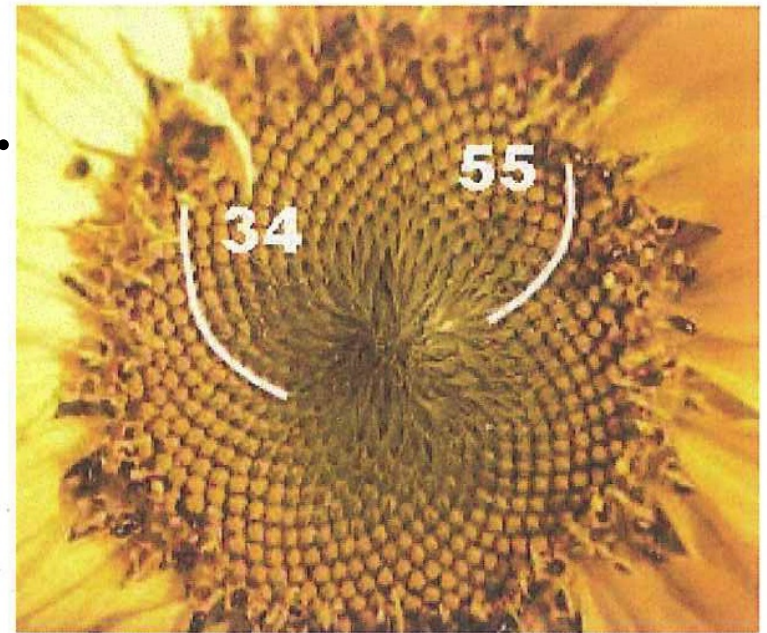
Série de Fibonacci:

0 1 1 2 3 5 8 13 21 34 55 ...

$13 / 8 = 1.625$      $55 / 34 = 1.617$

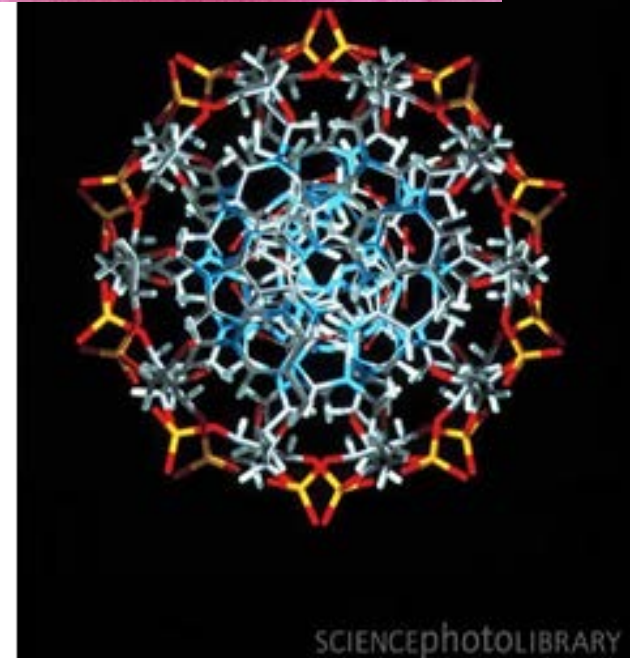
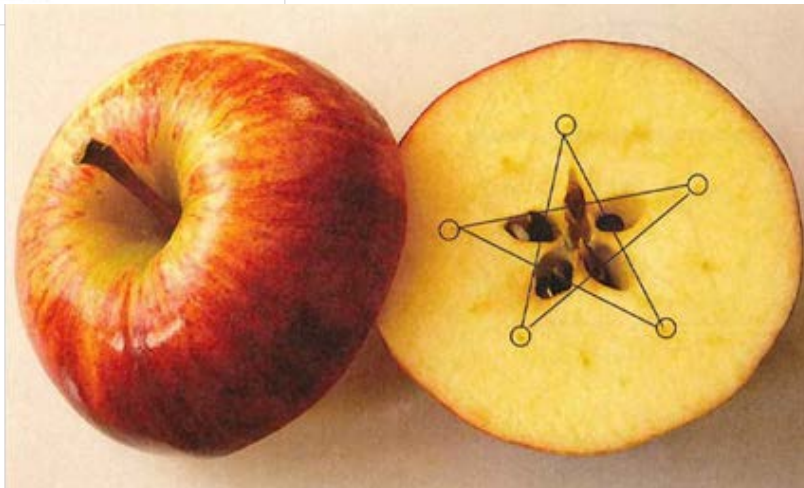
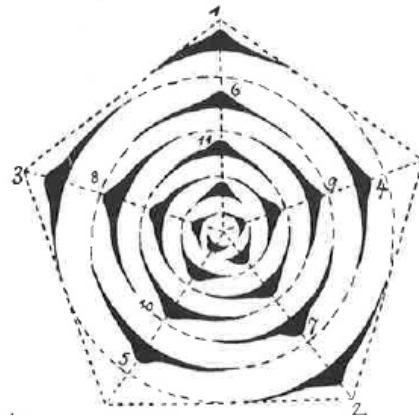
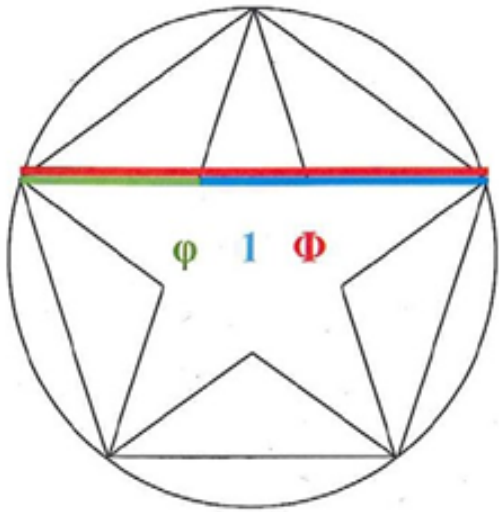
Nombre d'Or

$\Phi$  (Phi) = 1.61803 ...

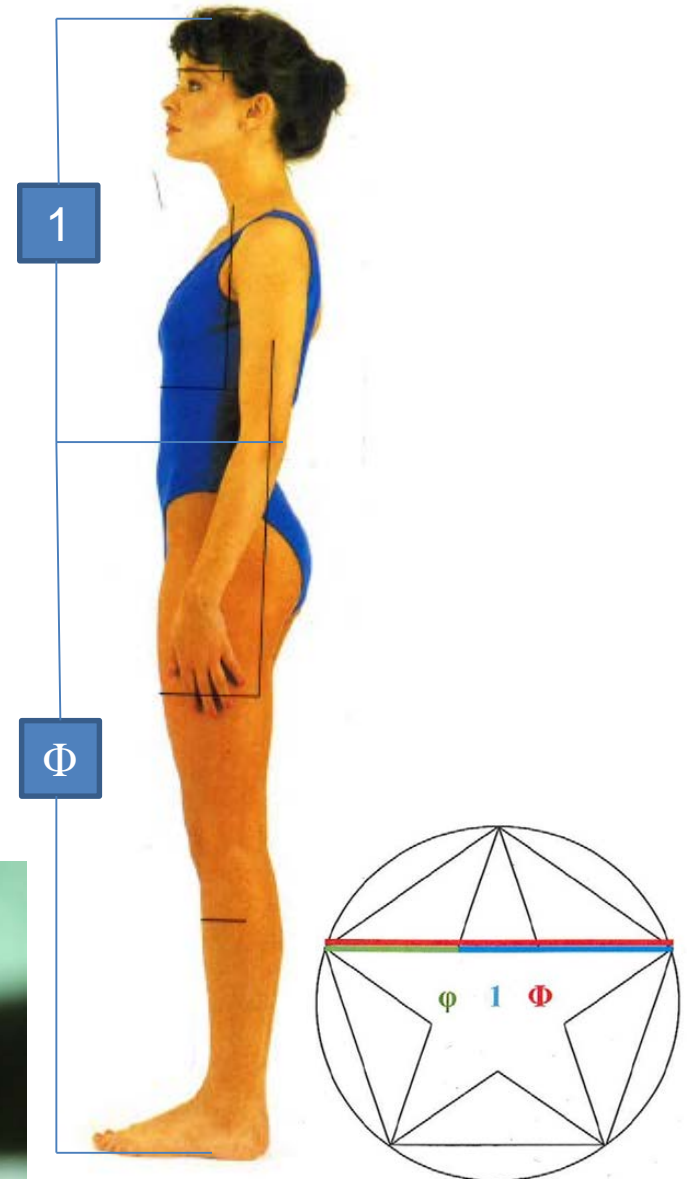
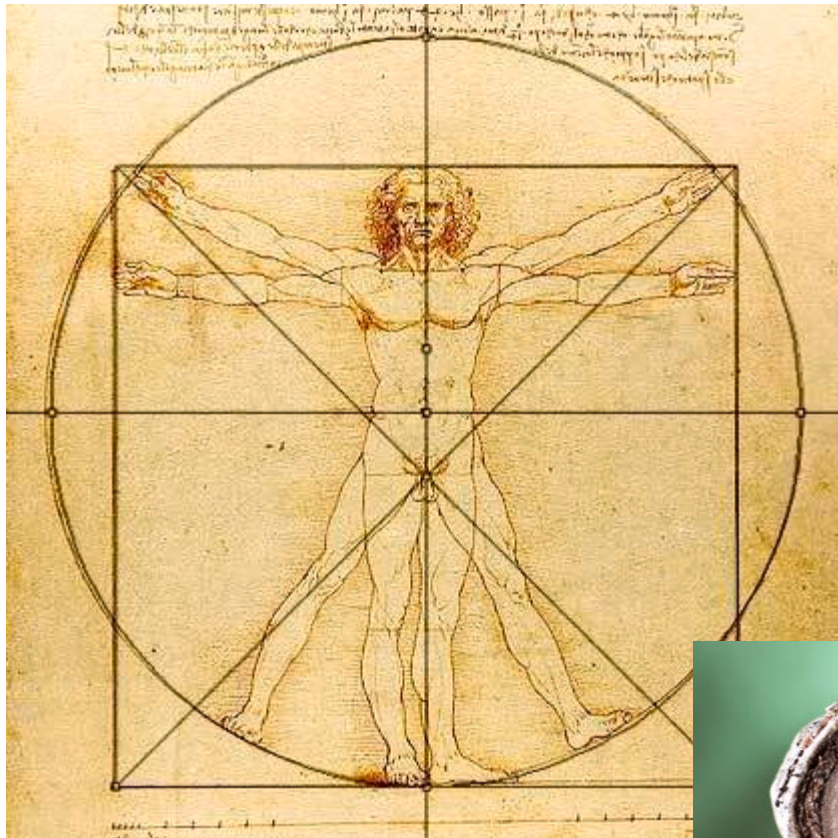


Beispiel Sonnenblume / *Tournesol*

# Fünfstern / Star with 5 branches and the Golden Section - Apple, Rose and DNA



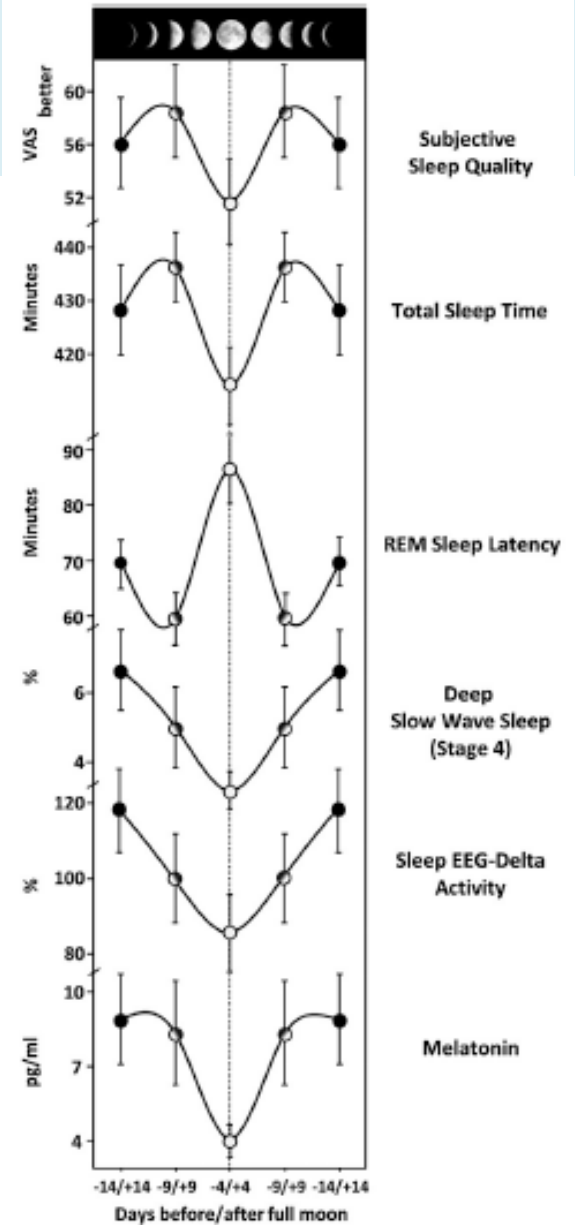
# Human body and the Golden Section



# Re-discover our own rhythms

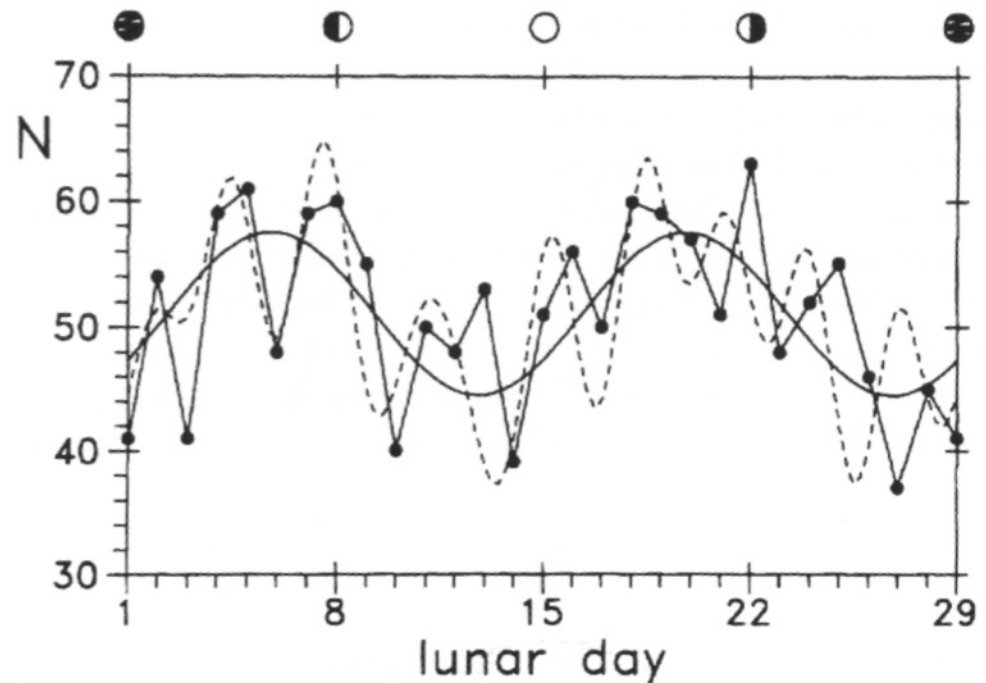
L'arbre comme modèle ...  
pulse en phase avec les  
grands rythmes terrestres  
et cosmiques - et y puise  
sa force ?

(Re)Découverts par hasard, des rythmes lunaires dans notre sommeil: - Qualité subjective / Durée totale / latence REM / Ondes lentes profondes / activité Delta EEG / Mélatonine (Cajochen et al. 2013)

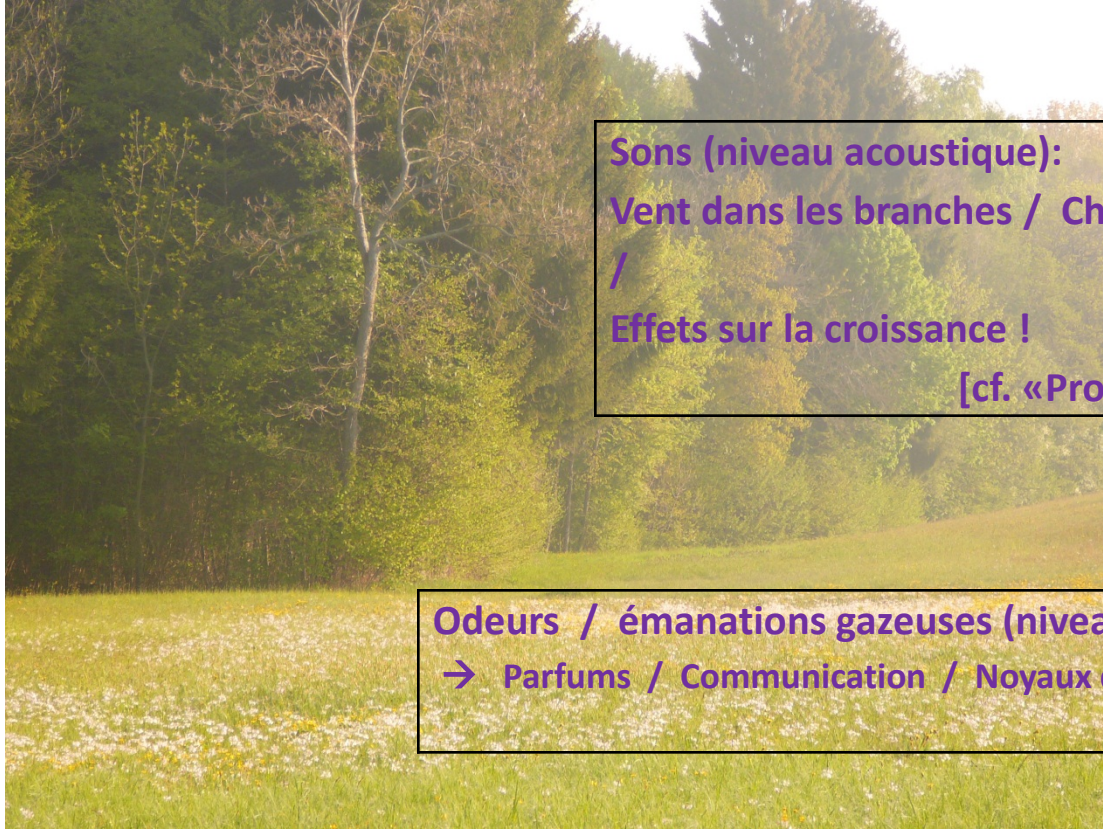


## ... and cycles in the human organism

- **Fruchtbarkeit:** deutlich periodisch. Mondbezogen? Svante Arrhenius (1898) / Folin *et al.* (2001): mittlere Periode = 27-28 d
- Variationen in der **Mortalität** (Strestik *et al.* 2001):



# *Subtle messages: - the last discoveries*



Sons (niveau acoustique):

Vent dans les branches / Chants d'oiseaux / Insectes  
/ Batraciens →

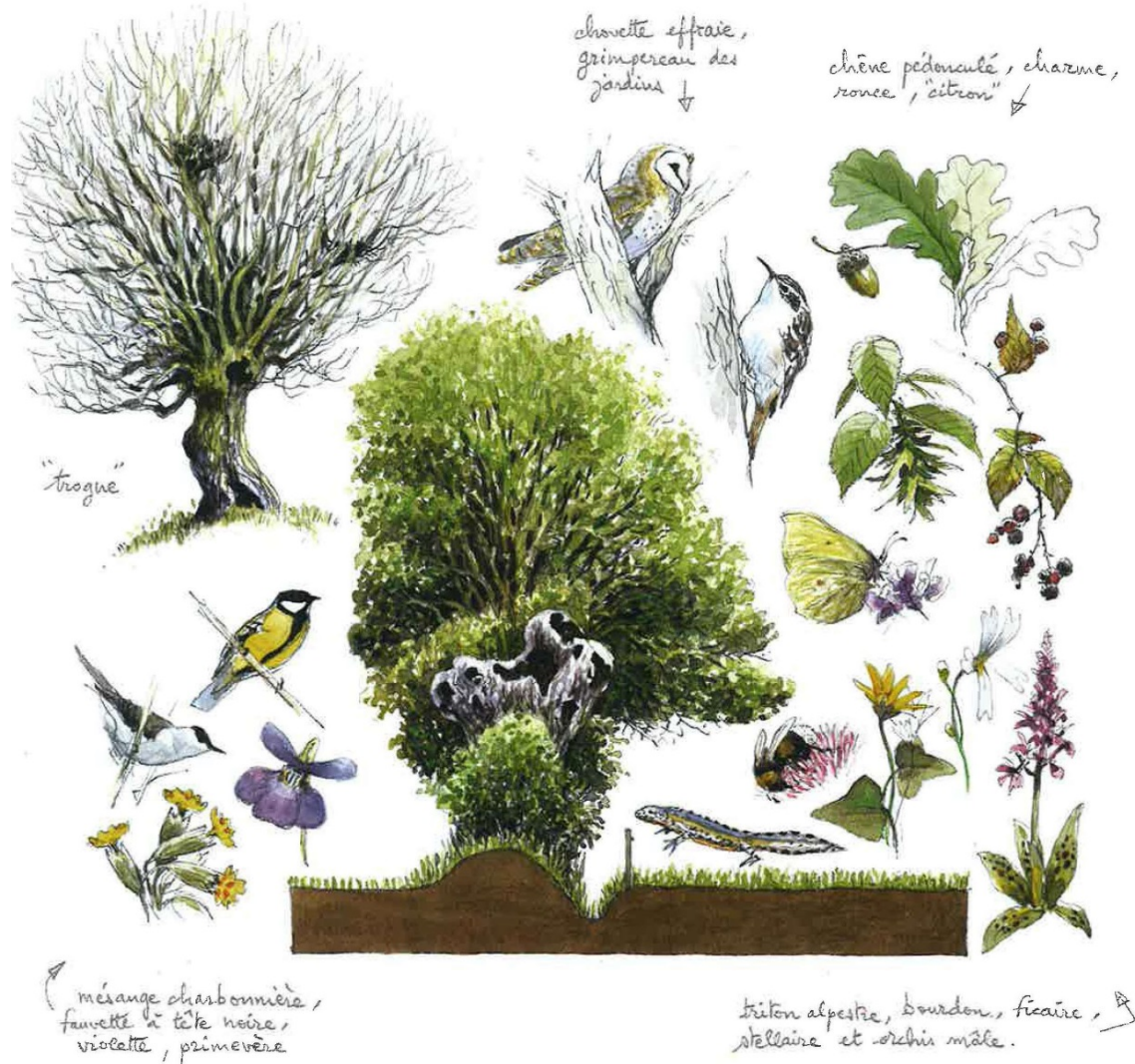
Effets sur la croissance !

[cf. «Protéodies», J. Sternheimer]

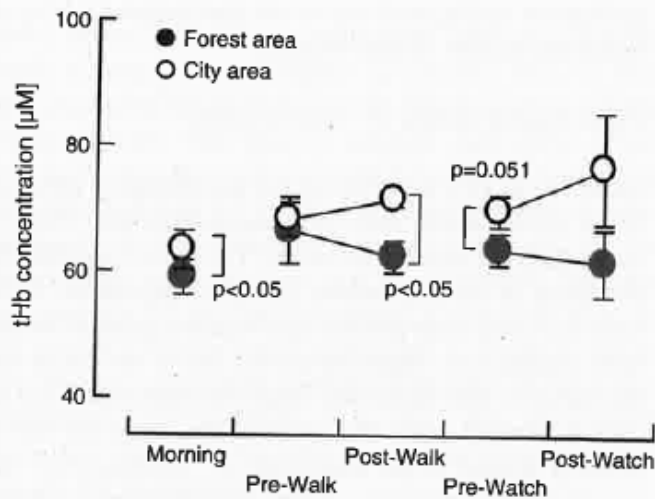
Odeurs / émanations gazeuses (niveau olfactif):

→ Parfums / Communication / Noyaux de condensation / Ionisation de l'air

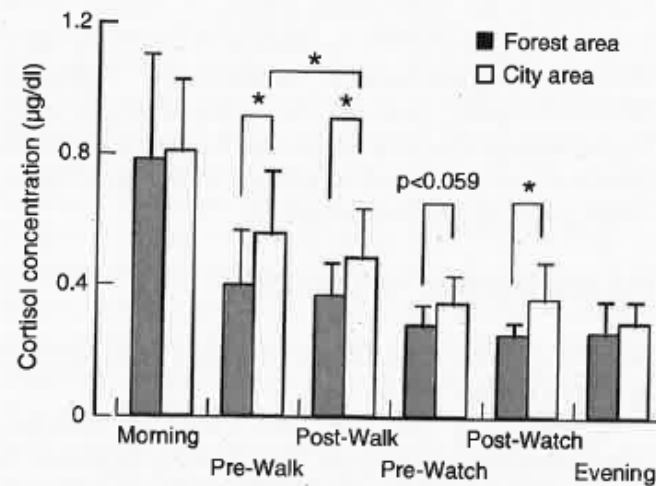
# Bird's songs and stridulations of insects: a Concert of natural proteodies ?



# The benefits of Forest Bathing → japanese «Shinrin Yoku»



**Fig. 1** Change in the average value of the absolute concentration of total hemoglobin (tHb) in the left prefrontal area in subjects walking for 20 min in a forest and city area [7].  $n = 5-12$ , mean  $\pm$  SD,  $p$  value by paired or unpaired  $t$  test (one-side test)

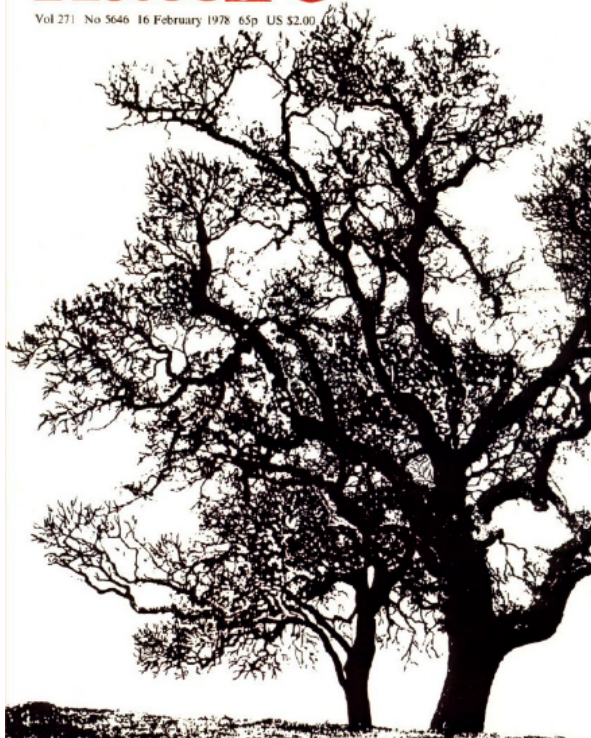


**Fig. 2** Changes in salivary cortisol concentration at six measurement times in subjects a forest area and in a city area [42].  $n = 9$  at "before walking" and "after walking",  $n = 11$  at the other times.  $*p < 0.05$  by the paired  $t$  test



nature

Vol 271 No 5646 16 February 1978 65p US \$2.00



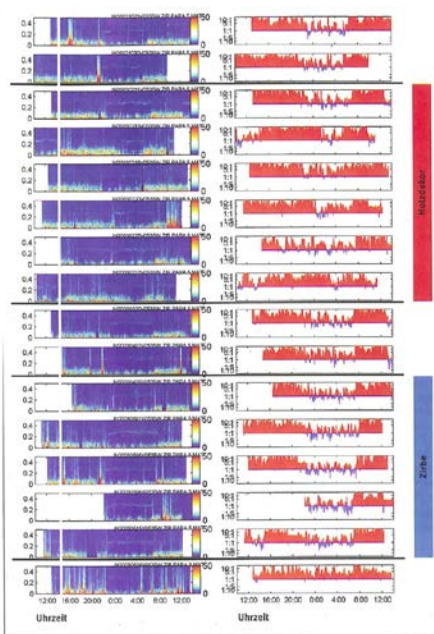
## Common frequencies



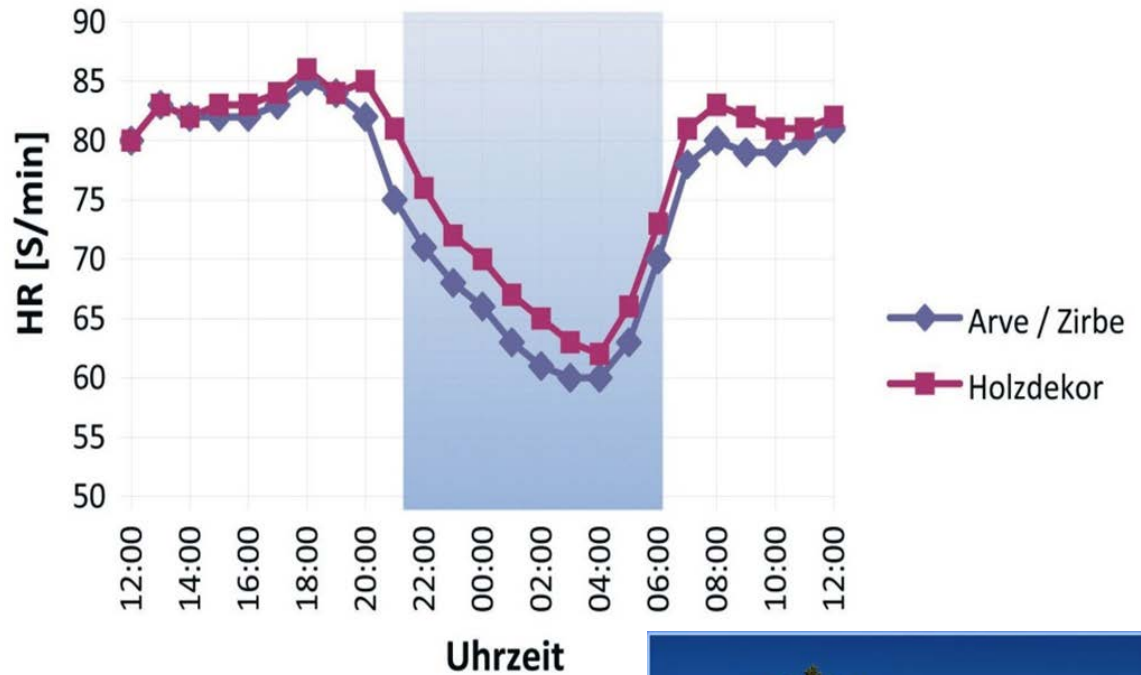
ULF tree potentials and geomagnetic pulsations. [1978]

**Antony C. Fraser Smith**  
Stanford EE - Stanford University - 710

# Heart rate influenced by wooden environment (Swiss Stone Pine *Pinus cembra*)



Aus dem Forschungsbericht, Studie 2: Schlafqualität und Bettenwahl



# „Mitakuye Oyasin“ (Lakota) – Nous sommes tous Un - Wir sind alle Eins - *We are all One*



Photo: André Hemelrijk

