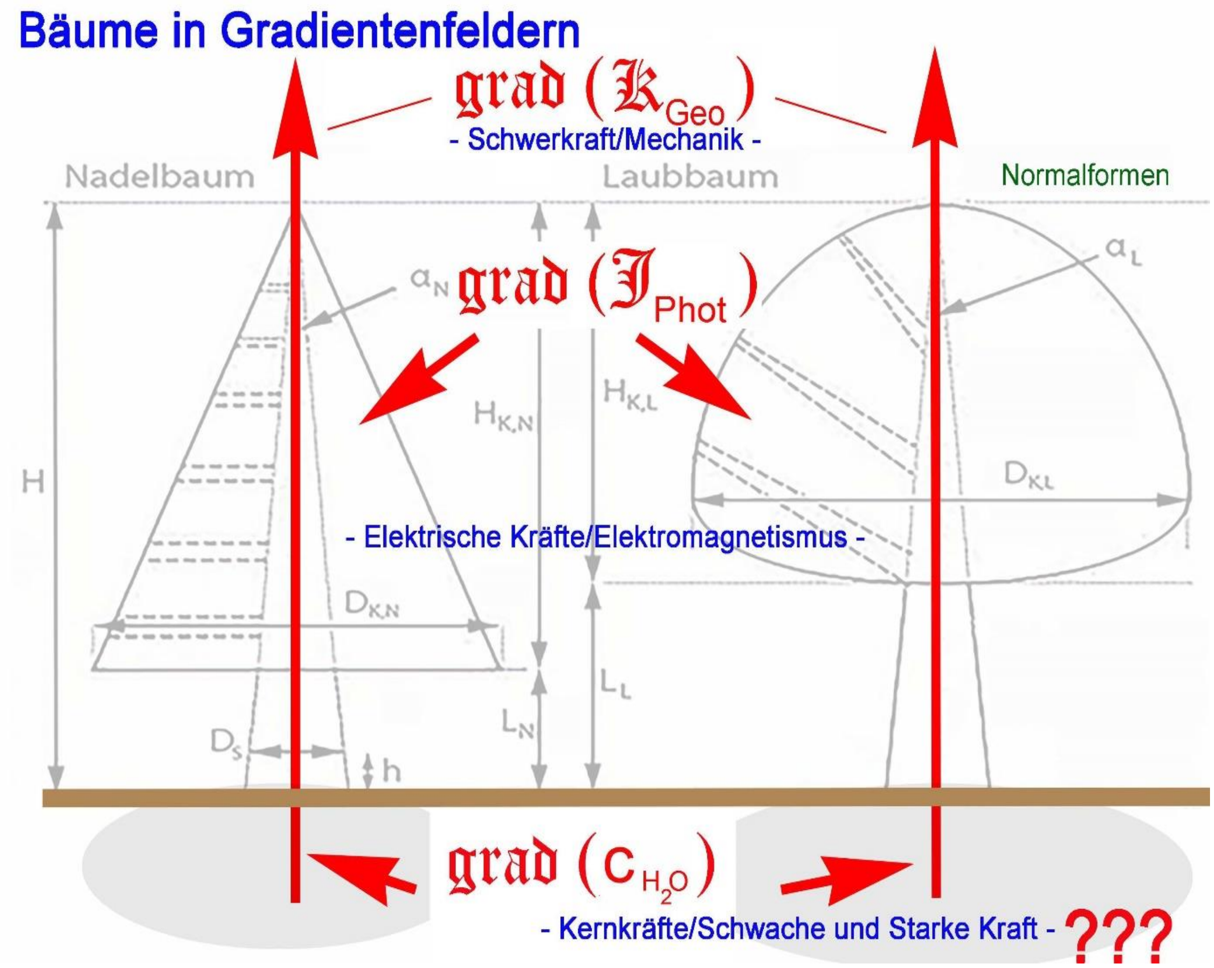
Neutronotropy of the trees

by Hans-Dieter Langer, Niederwiesa

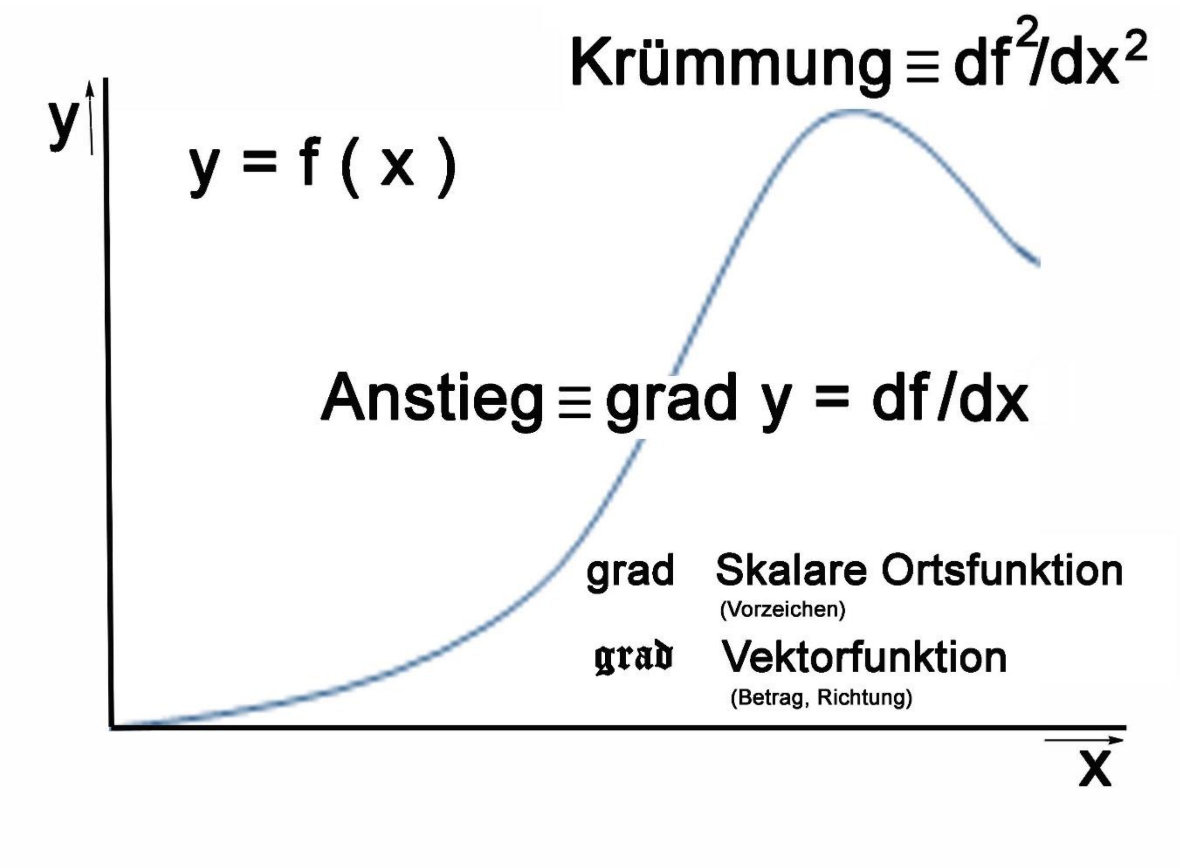
With this presentation, the author refers to his scientific book "The Misery of Trees - Neutronotropy: A Contribution to the Physics of Life".

Movement physiology (tropics) and shape (stimulus adaptation)

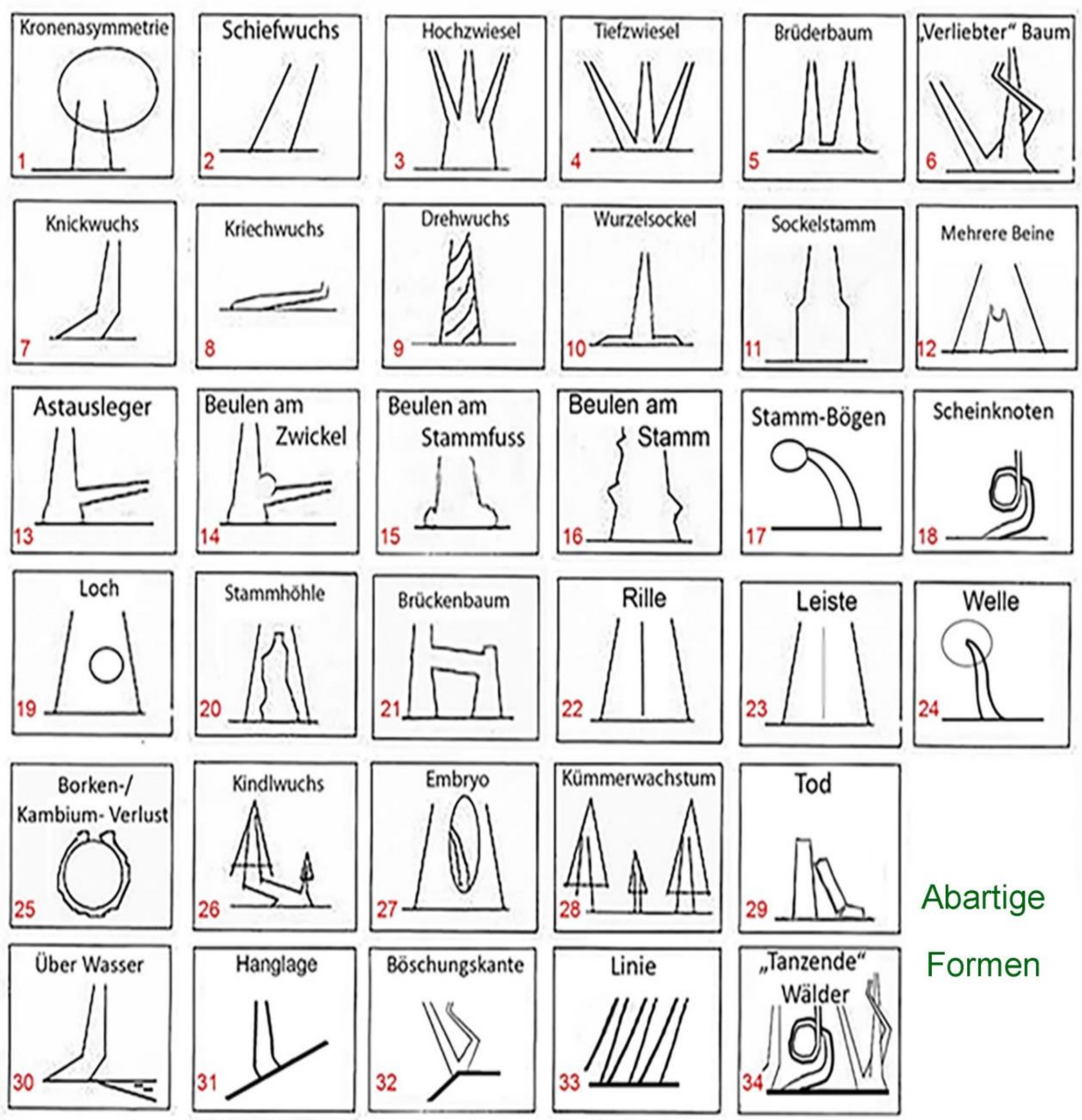
"Normal growth" of the trees and consequently their external "normal appearance" is the adaptation to environmental stimuli, which usually include above all gravity and the photon current density as well as the nutrient concentrate distributions (e.g. the surrounding water concentration in the soil) as vectors. In addition to the amounts, the spatial distributions or orientations of the stimulus parameters, i.e. their gradient fields, are decisive.



For the sake of simplicity in one dimension, we should be reminded of the mathematical meaning of the gradient as the rise of a curve y = f (x). When looking at space, one proceeds to the gradient as a vector, which in addition to the amount at each location also has a direction.



In nature we often observe “abnormal growth” or “abnormal tree shape”, see the symbolic sketches below. The explanation of the causes is contradictory in the relevant sciences, too primitive or missing entirely. This is where the author's physically oriented research into causes started over 25 years ago.



The author believes that after so long intensive study of the topic (nature observations, literature research, field measurements in the vicinity of abnormally grown trees, laser simulation of particle streams, development of tree shape models, theoretical approaches to flight, defense, growth force and downfall reactions of trees) that the natural terrestrial nuclear radiation is a crucial motor of abnormal tree growth and describes this phenomenon as neutronotropy.

To understand the origin of natural terrestrial nuclear radiation in connection with the natural occurrence of free neutrons in the biosphere, a few striking nuclear reactions are mentioned below, which occur all and everywhere in the near-surface earth body, but are not only terrestrial, but above all also cosmic in origin.

Origin of the natural terrestrial and cosmic/terrestrial nuclear radiation

Terrestrisch:

$$^{238}_{92}U \longrightarrow {}^{140}_{54}Xe + {}^{96}_{38}Sr + 2\,{}^{1}_{0}n_{Geo}$$

U-Zerfälle

$$^{238}_{92}U \longrightarrow {}^{133}_{51}Sb + {}^{102}_{41}Nb + 3\,{}^{1}_{0}n_{Geo}$$

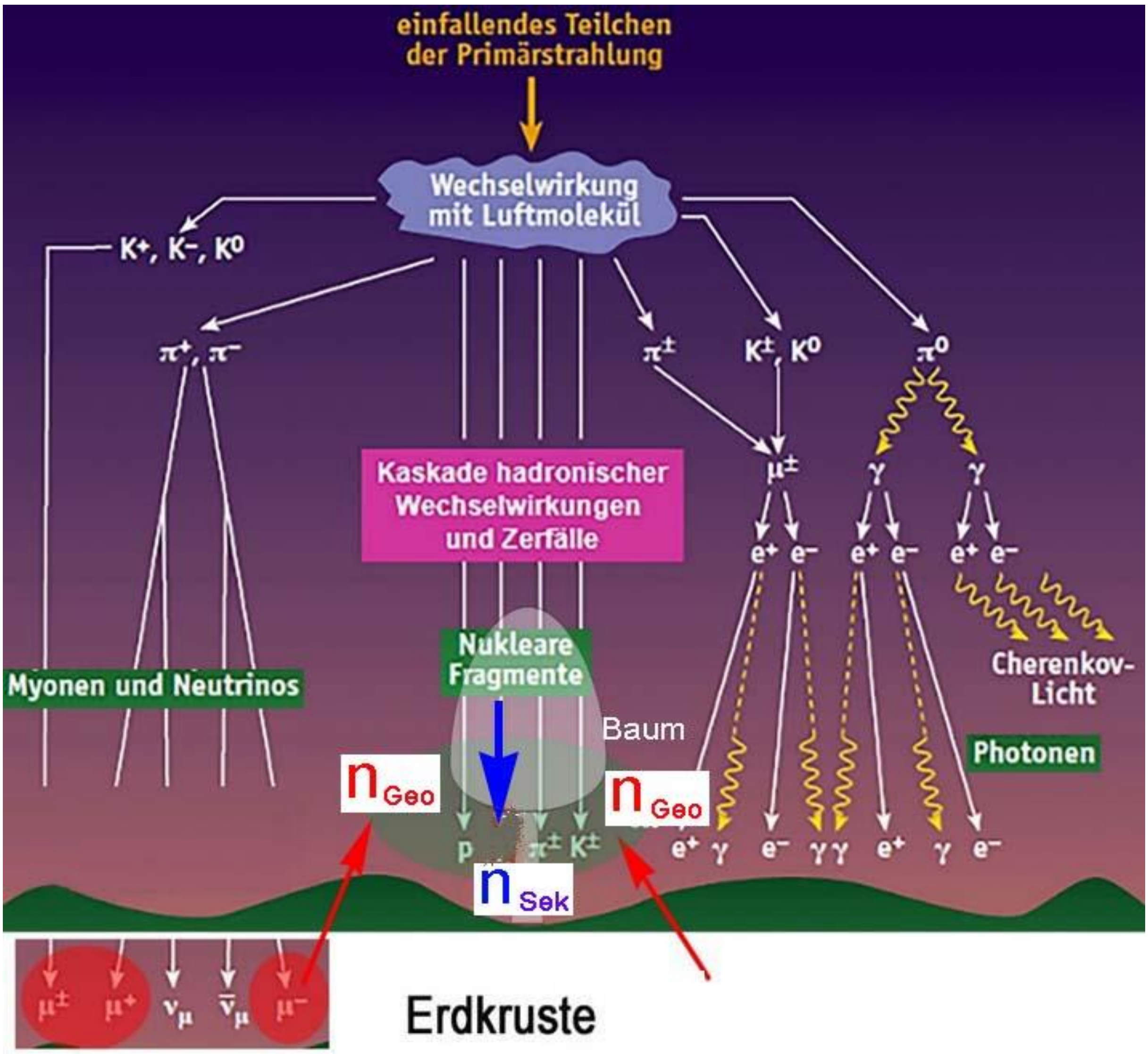
$$^{9}_{4}Be + {}^{4}_{2}\alpha \longrightarrow {}^{12}_{6}C + {}^{1}_{0}n_{Geo}$$ Be-Kernumwandlung

Kosmisch:

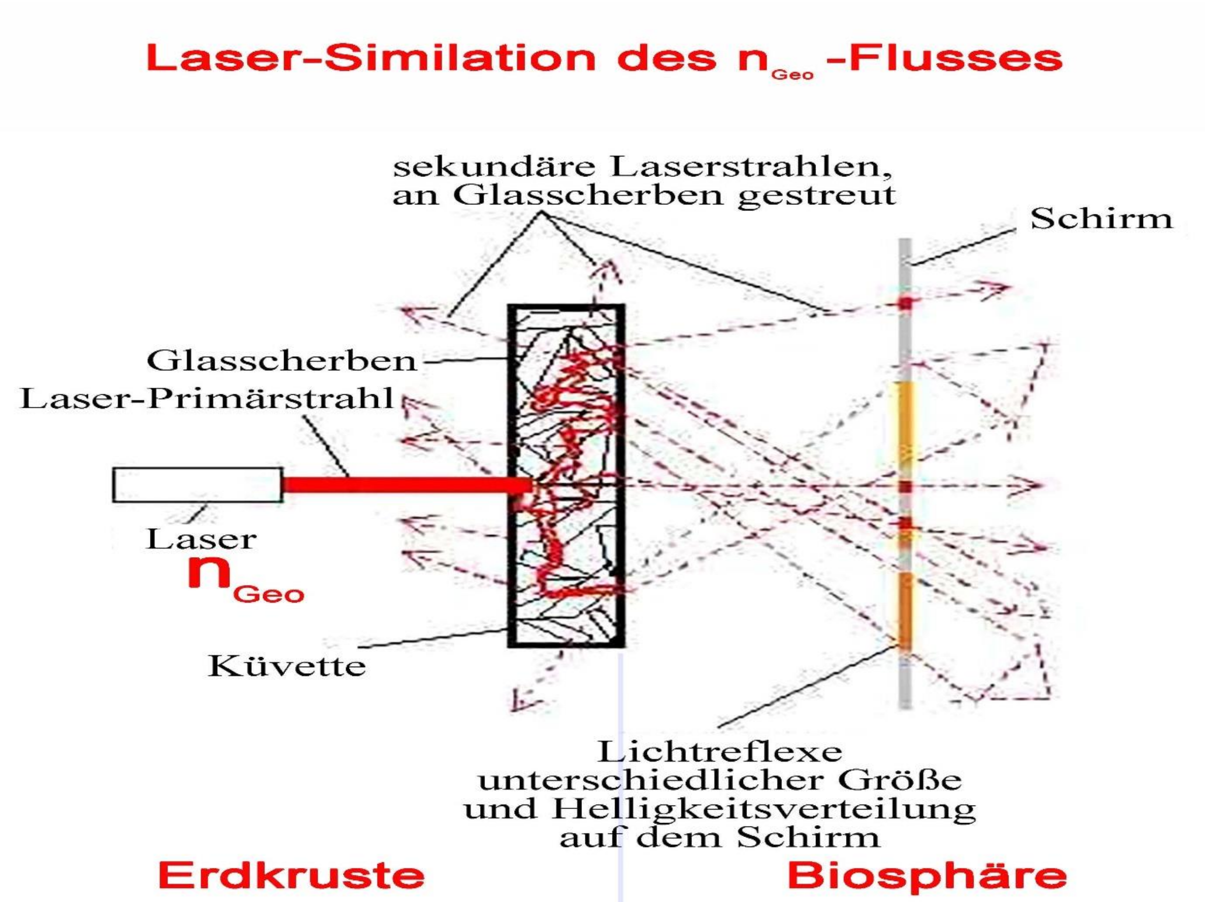
$$\mu^{-} + p \longrightarrow n_{Geo} + \nu_{\bar{\mu}}$$ Myon-Proton-Reaktion

The cosmic radiation (CR) causes versatile secondary radiation in the earthly atmosphere through various interactions. In particular, the secondary neutron flux density (n_{sec}) on the ground is proportional to the primary flux density, so that - supported by a worldwide neutron monitor network - it serves as an indirect measure of CR. However, this means that there is also an n_{sec} flow in the biosphere, which is subject to many scattering processes in the air with statistical distribution of direction of the surviving or generated free n_{sec}.

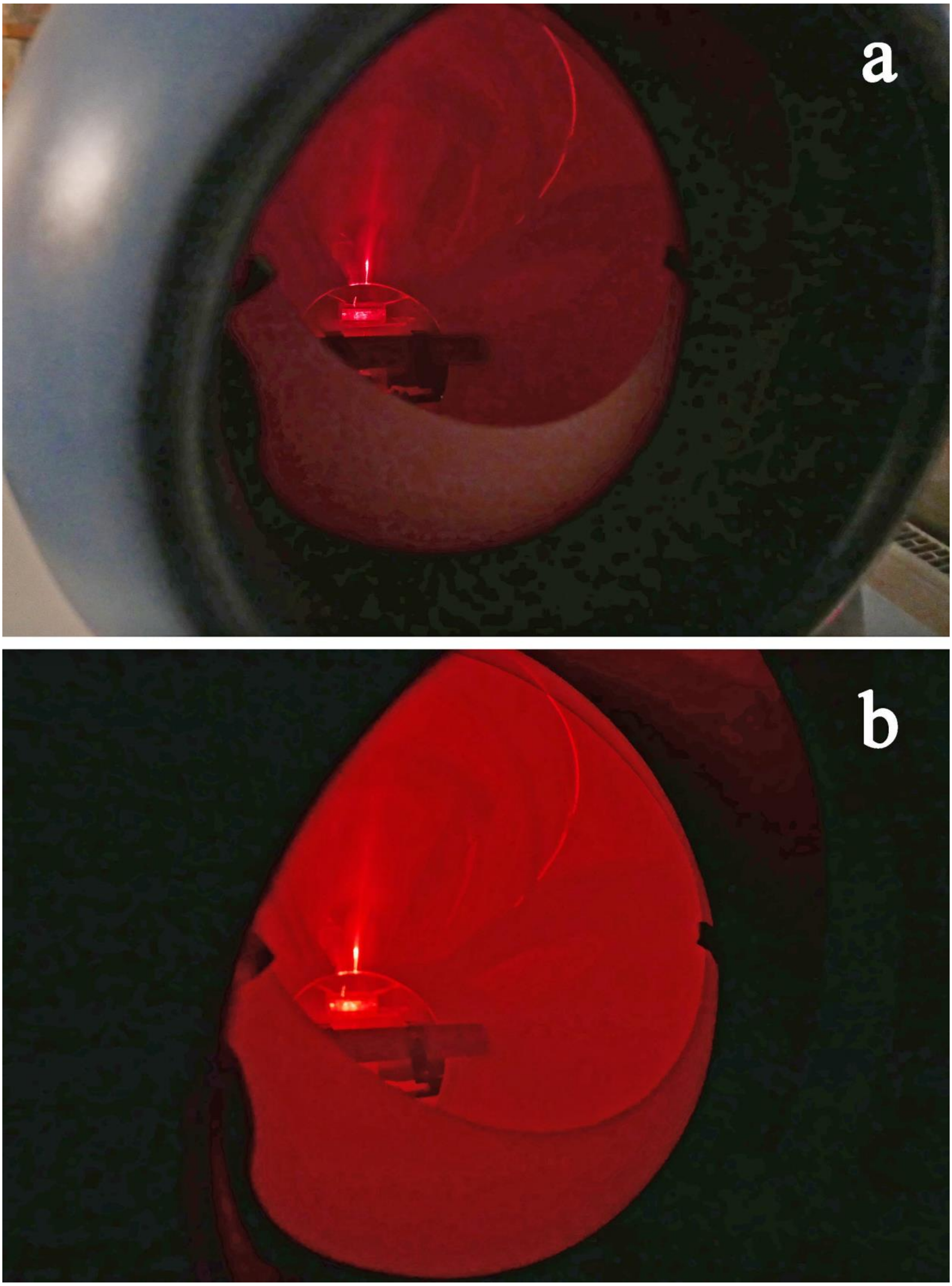
In particular, muons (μ) of the secondary CR penetrate into the earth's crust, where they generate free neutrons through nuclear interactions. Some of these therefore contribute proportionately to the n_{Geo} flow, which enters the biosphere from below.



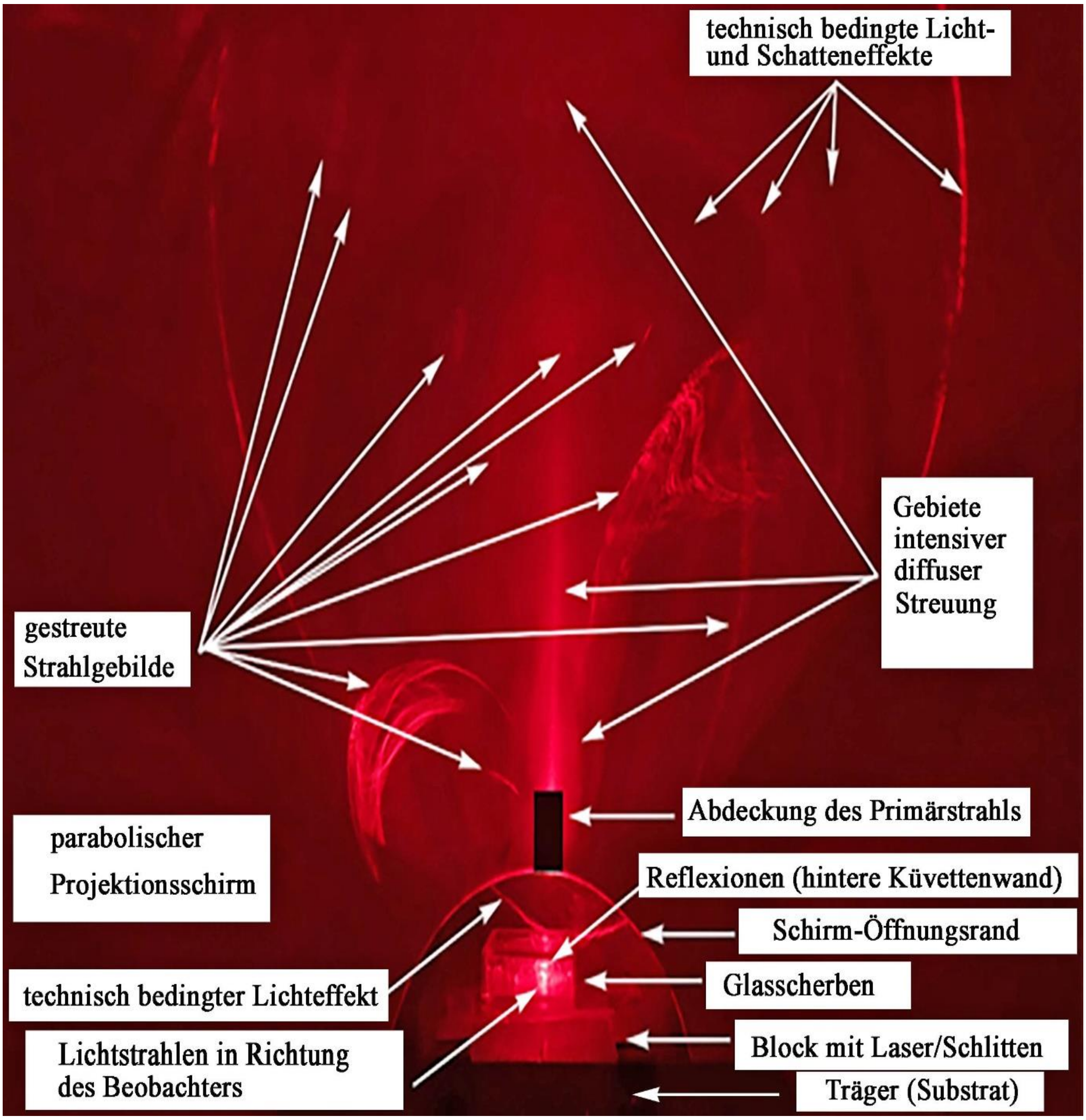
Since all n_{Geo} pass through the locally stationary (unchanged in time) real structure of the near-surface earth's crust, the n_{Geo} flow in the biosphere is also structured in a stationary manner. To get an idea of the possible structures of a corresponding particle flow, a laser simulation (as a demo in the dark) was developed. As an example, e.g. below simulates the real microcrack structure in the earth's subsurface with broken glass edges (located in a cuvette), which a laser beam penetrates. The comparison of the interaction of photons with broken glass surfaces with that of nuclear particles, here neutrons, with microcracks is physically permissible, especially since the microcracks in the ground are mostly loaded with moisture (H atomic nuclei!). One observes the photon distribution after the passage of matter on a screen with different distances. In order to simulate the n_{Geo} primary flow (which was largely assumed to be homogeneous before the passage of matter), the laser photon ray can be moved linearly (or flatly) using a slide.



Photos of the simulation device:



Snapshot with the screen image in the background and the laser carriage in the foreground (with technical and technical explanations):

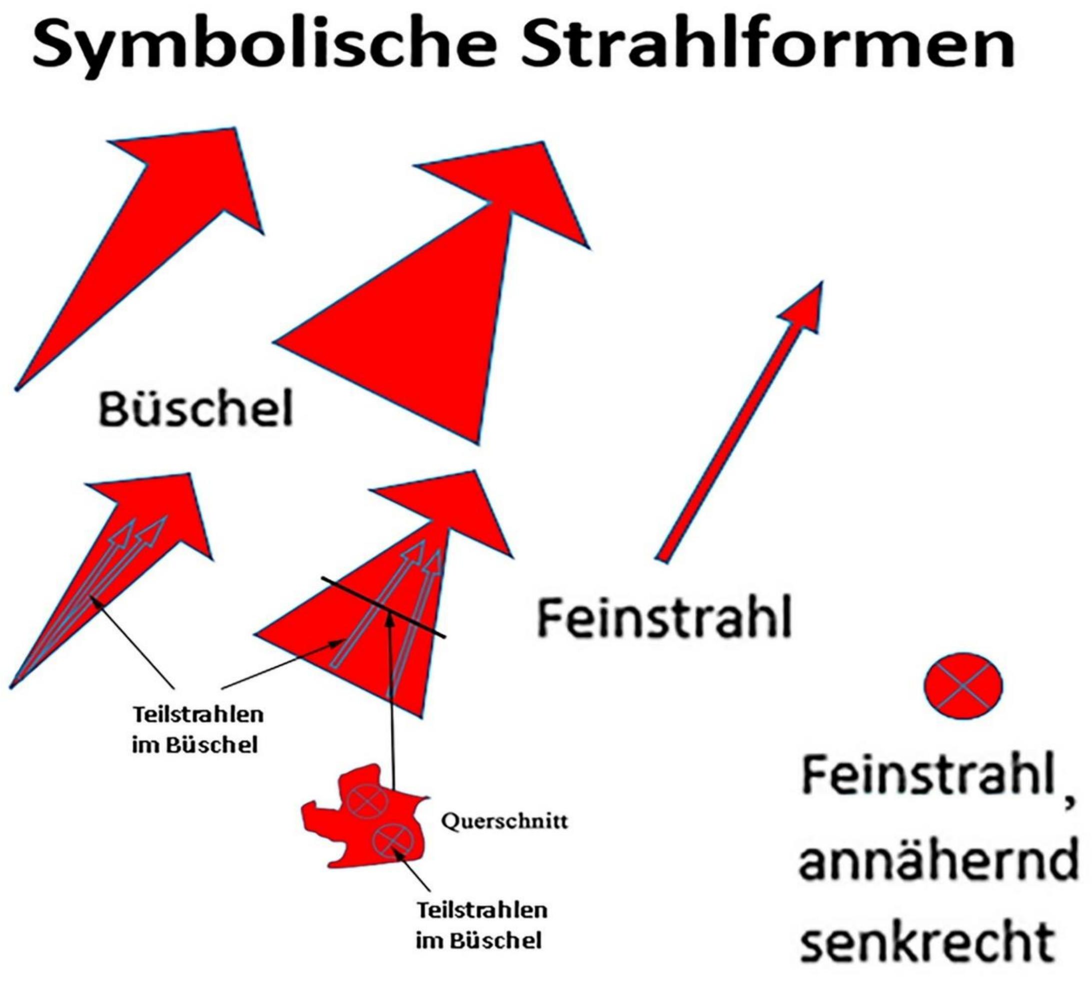


As a result of the laser simulation, a number of conclusions can be drawn as to the structure of the n_{Geo} flow in the biosphere. So follows, among other things:

* In the biosphere, in addition to more diffuse n_{Geo} flows, stationary beam structures of the geoneutrons are also to be expected.

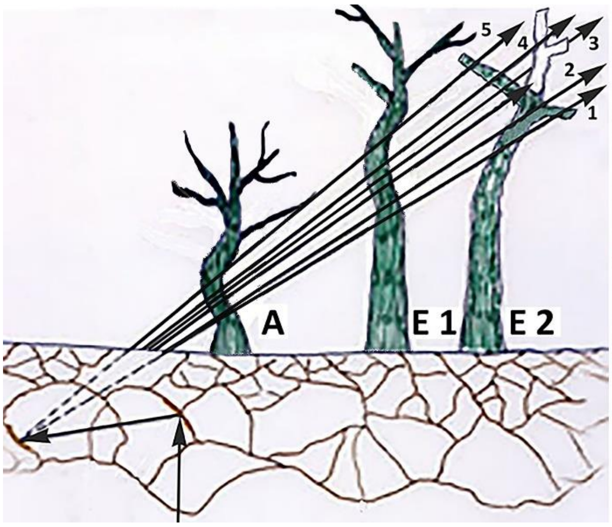
* Every square meter of the earth's surface is practically a "neutron garden", i.e. almost every tree can be affected by neutronotropy.

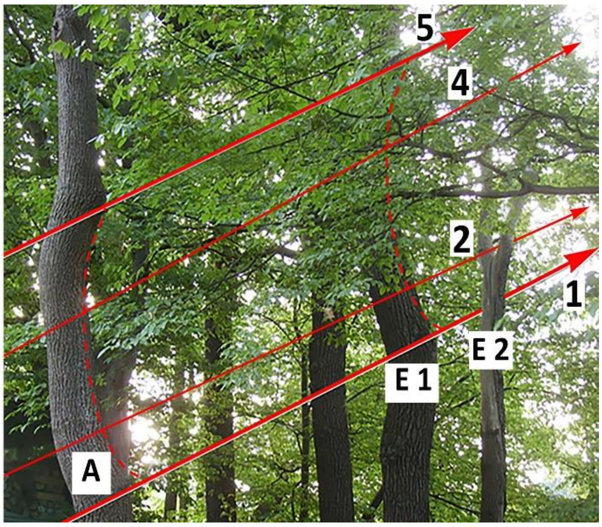
* Typical n_{Geo} beam shapes are symbolically outlined below:



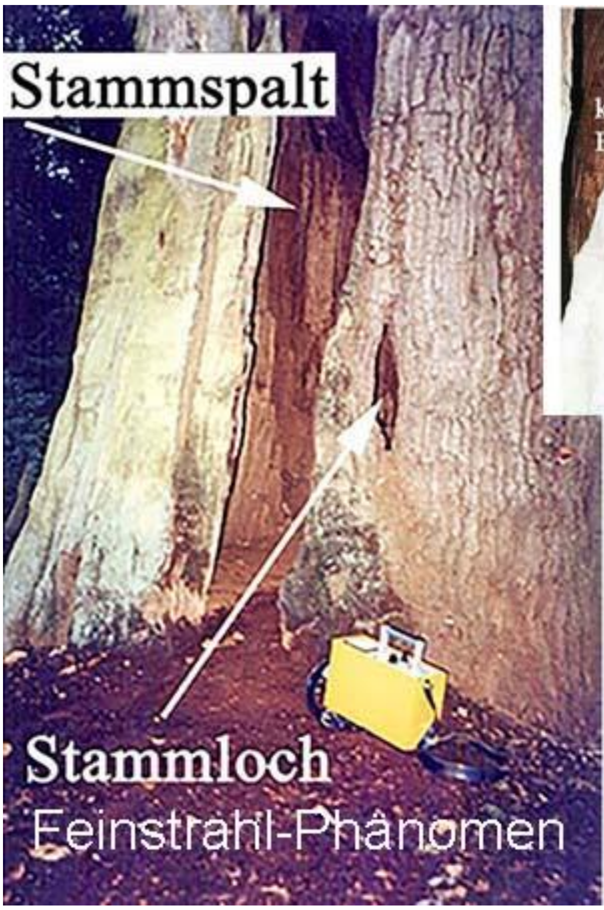
Relevant nature observations

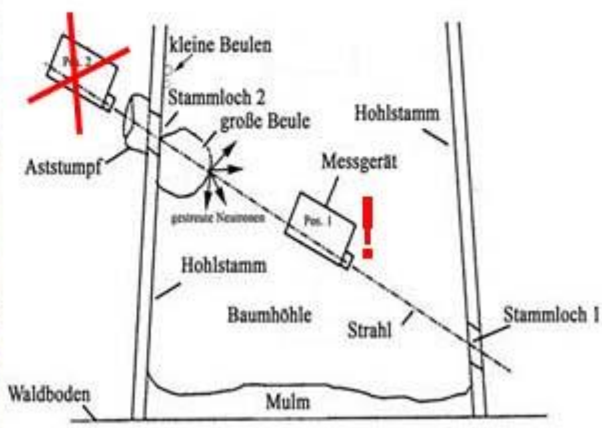
Three trees depict a n_{Geo} beam cluster in Niederwiesa:





An oak in the Saba primeval forest depicts a n_{Geo} fine beam (proven by neutron measurement!):



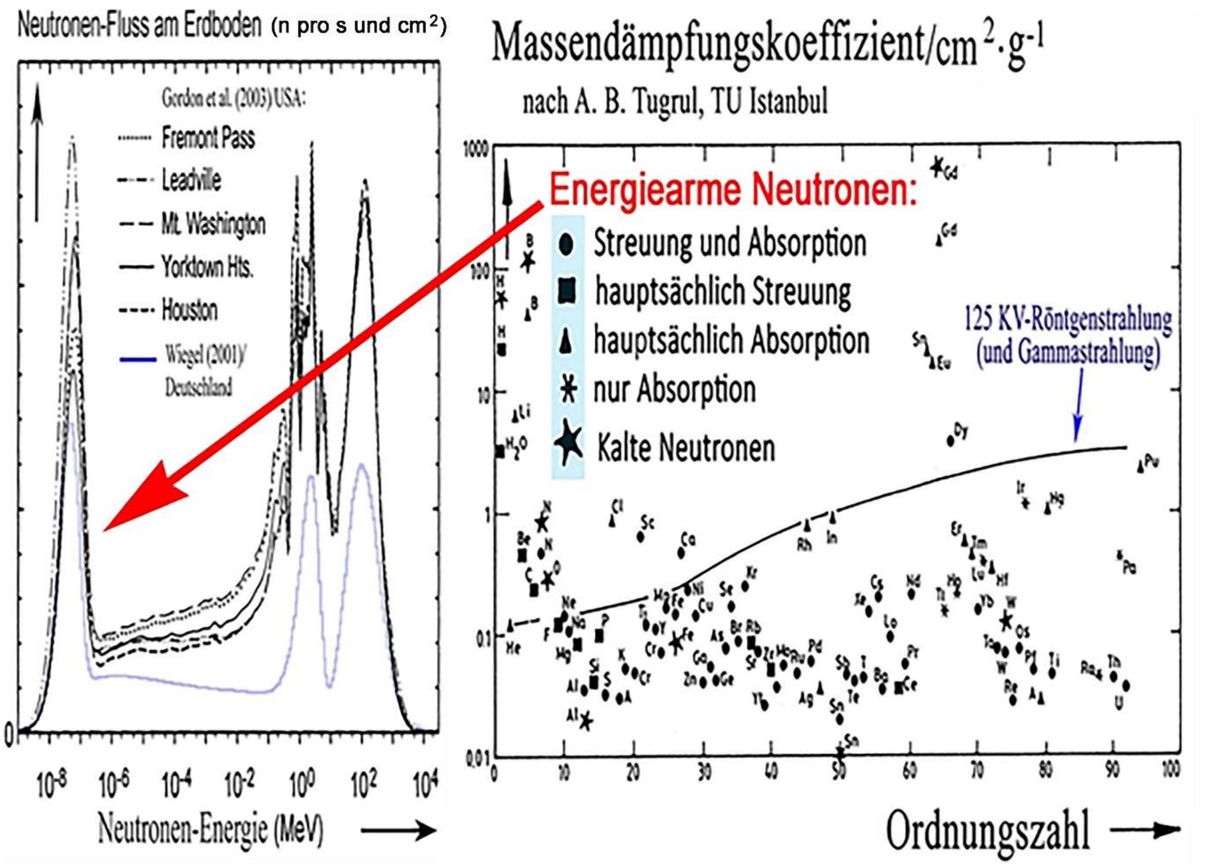


Some characteristics of the neutrons:

H, N, C - highest cross sections (especially for slow neutrons); therefore living beings most affected

According to specialist literature, a single neutron can lead to massive damage or death of living beings.

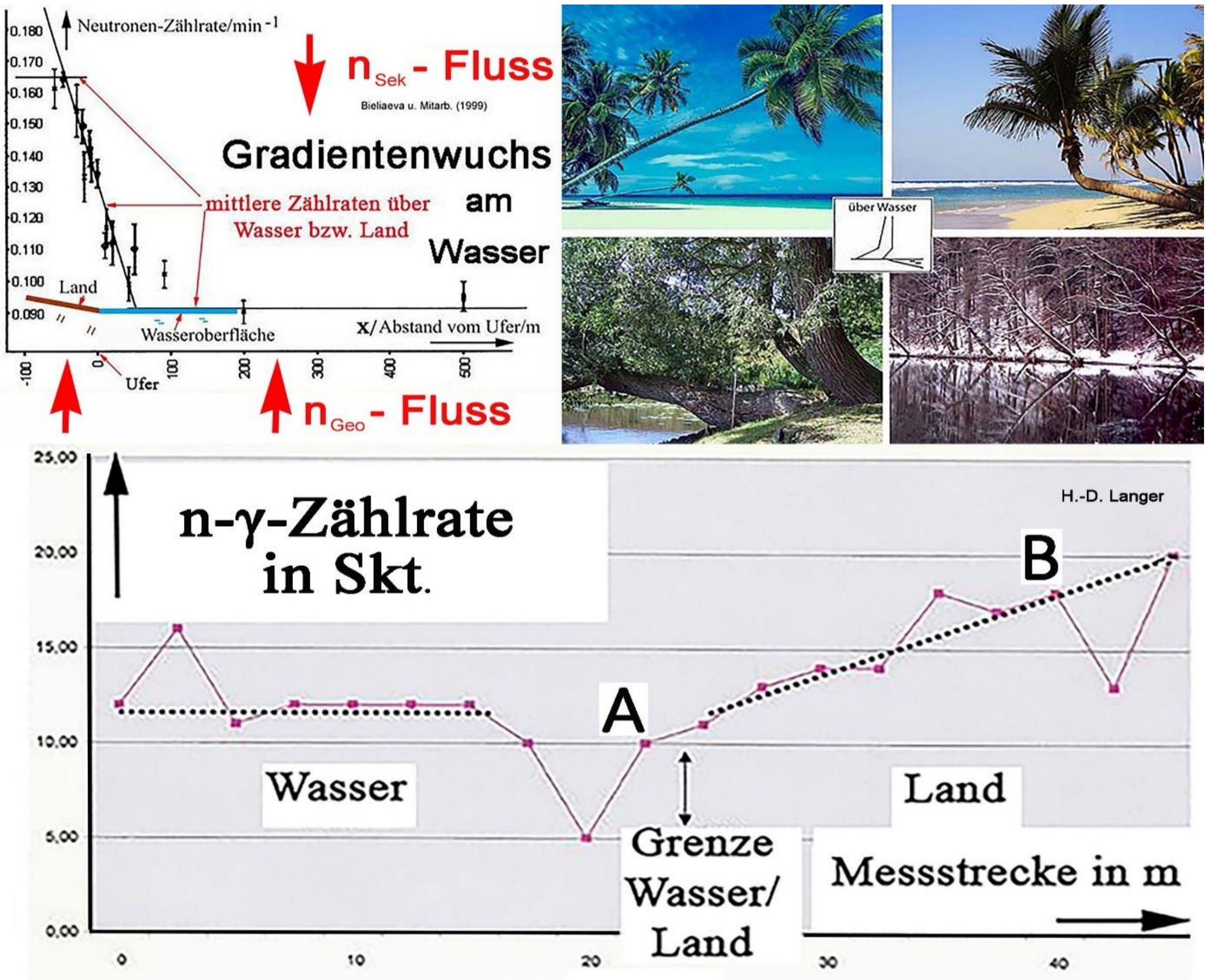
The energy distribution of the free neutrons (n_{Geo} and n_{Sec}) at the surface of almost all parts of the world is just well known as their interaction (e.g. mass damping coefficients of the low-energy free neutrons, which according to measurements are very common) depending on the atomic number.



We are now using nature observations, impact models and nuclear radiation measurements to investigate the different growth behavior of trees at different locations:

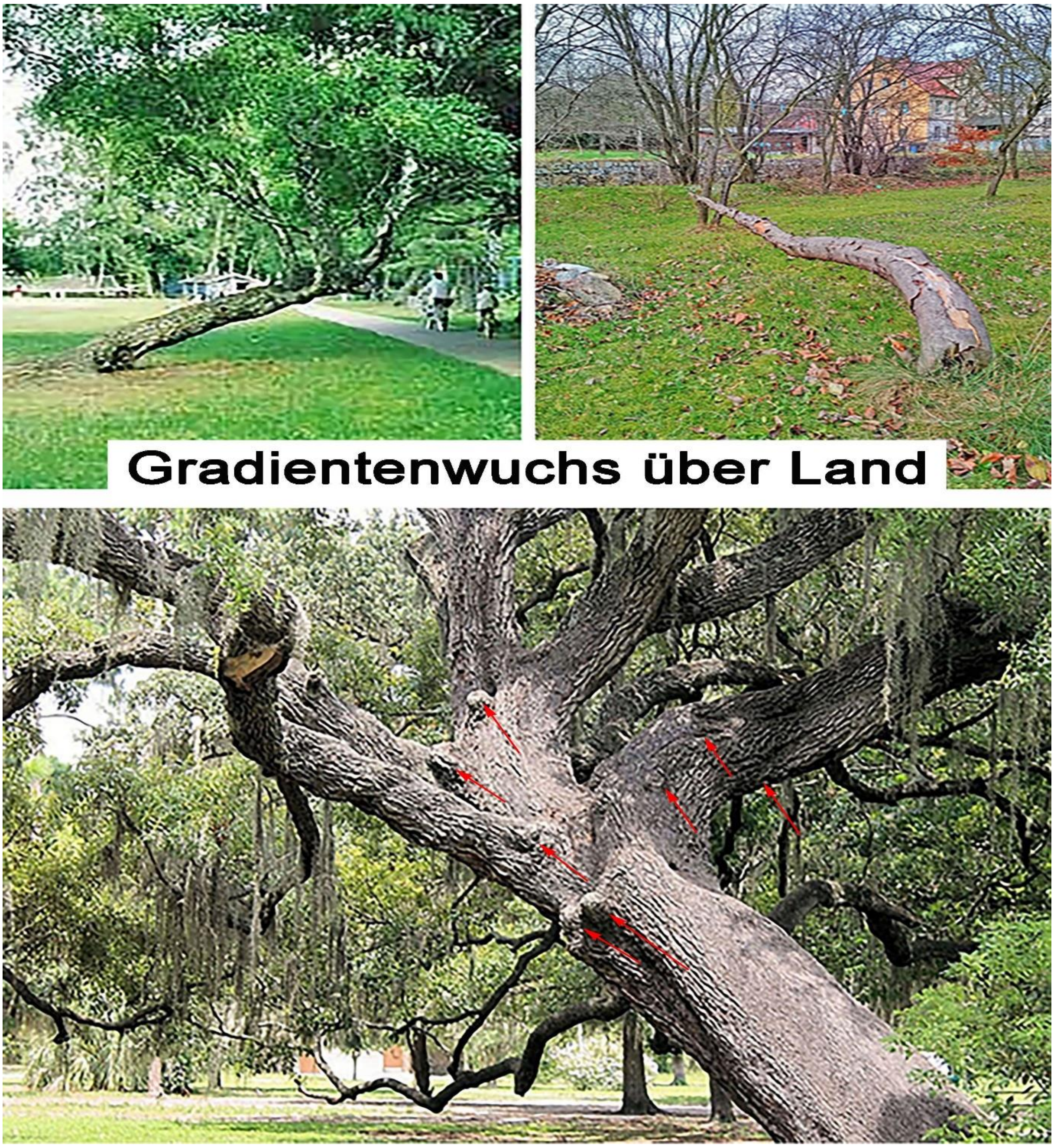
Gradient growth at the water's edge

The sandy beach on the shore absorbs water in its pore system. However, the moisture concentration gradually drops towards the land as a result of evaporation. So we have a typical, in many cases linear H_2O gradient in this soil. Since H has one of the greatest mass damping coefficients for neutrons (n_{Geo} absorption in the ground!), the gradient of the n_{Geo} concentration in the airspace follows it proportionally with the opposite sign. According to the neutronotropy thesis, trees flee from the high to low n_{Geo} flows. This explains e.g. their sloping growth on the water's edge.



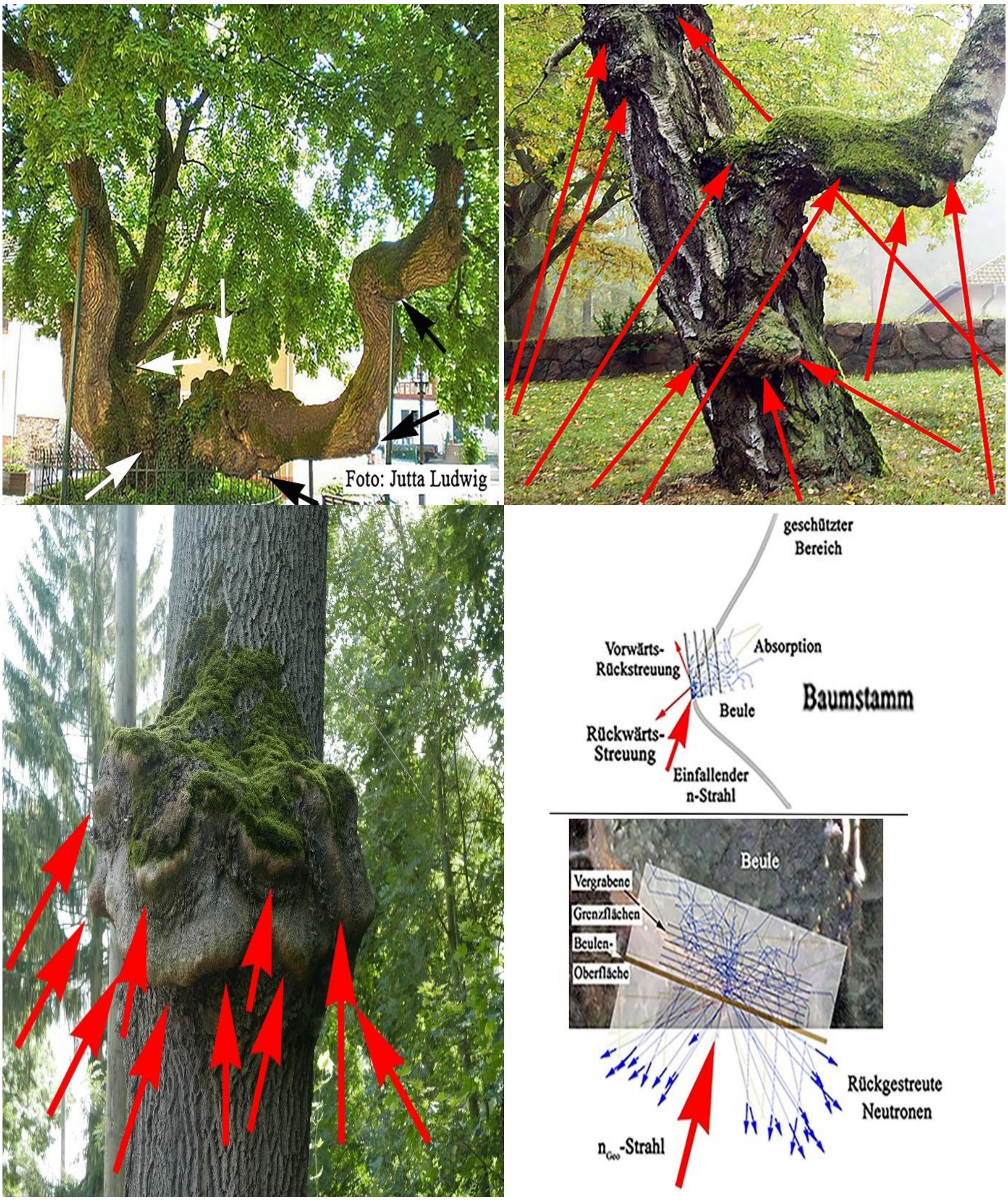
Gradient growth over land

Of course there are moisture gradients in every floor (also far from surface waters), but gradients of other n_{Geo} absorbers also occur here. However, this only explains part of the growth phenomena of trees over land. Characteristic bump structures in particular signal that there are completely different effects involved, e.g. on those sloping trees as a result of gradient growth as an escape reaction:



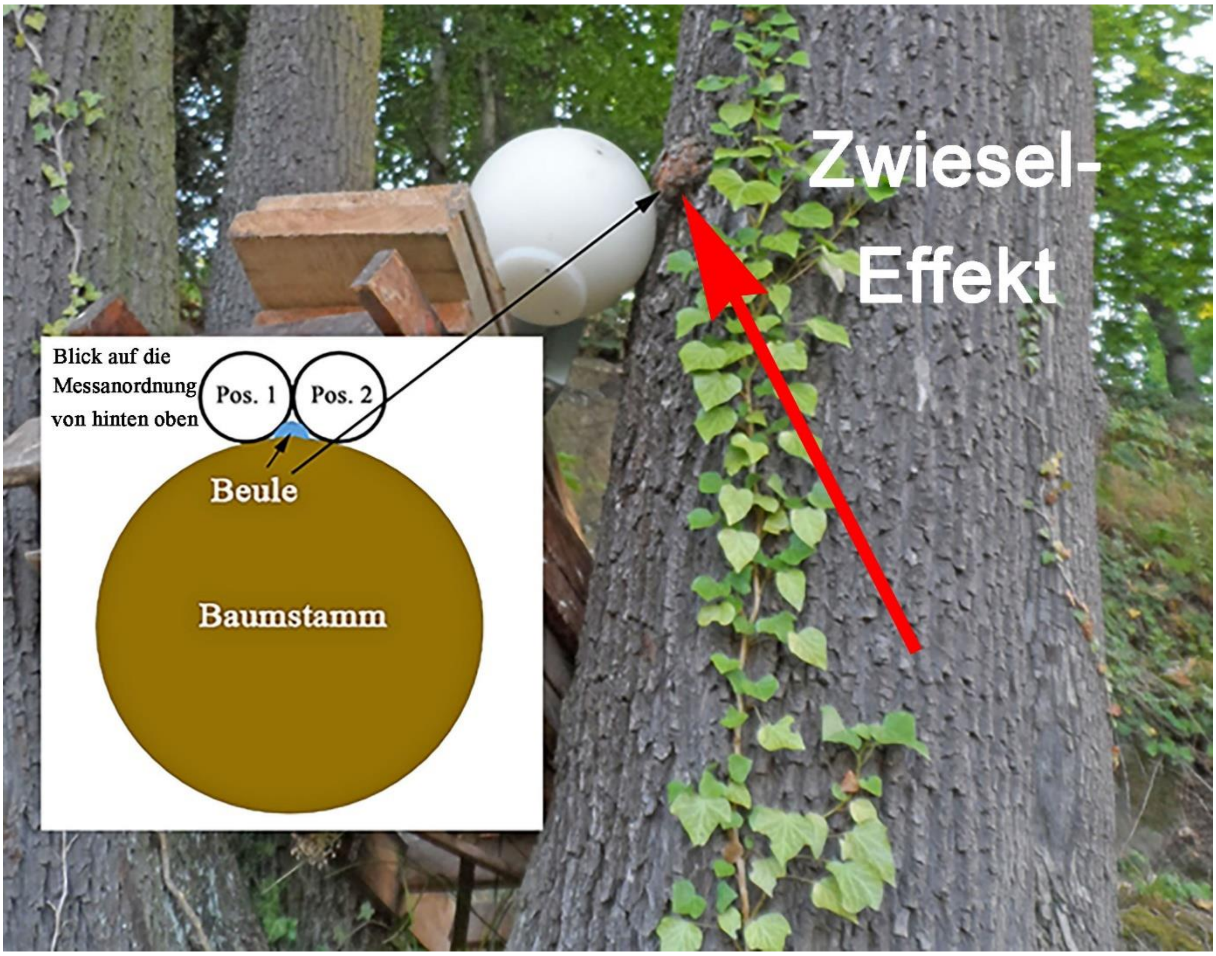
Defense effect of bumps

The own investigations, supported by n_{Geo} measurements, prove, among other things, that the trees have a defense mechanism of bumps, which is due to neutron scattering mechanisms. And we are now finally encountering the n_{Geo} beam phenomenon (here indicated schematically with red arrows).



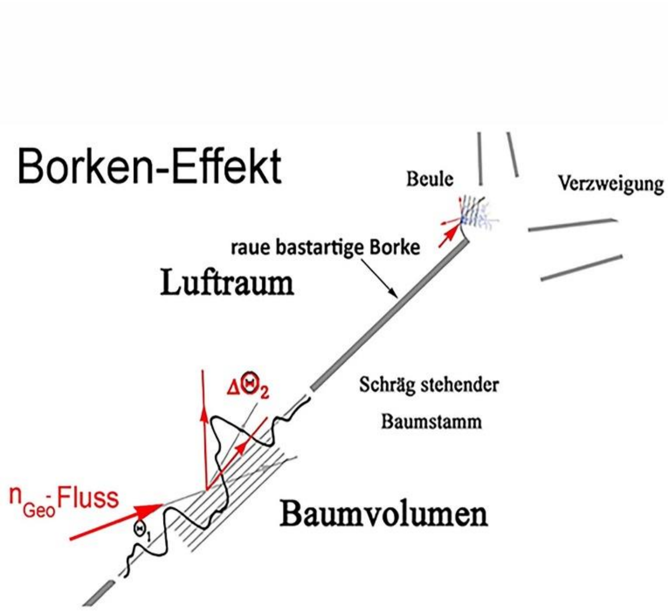
Extremely abnormal growth examples with the phenomenon of bumps (Wolframslinde to Bad Kötzing, Kirchen-Esche to Jachymov) already logically indicate a corresponding (defense) survival mechanism:

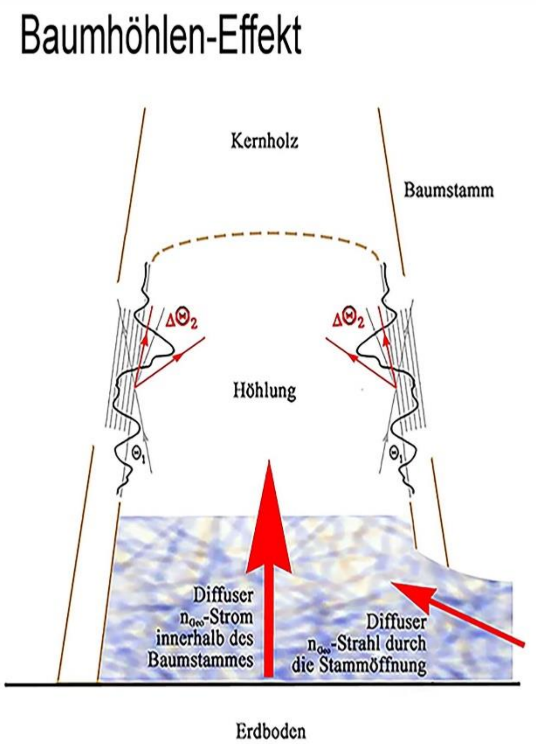
The next photo with a sketch shows a own measuring arrangement to determine the n_{Geo} beam direction on a small bump:

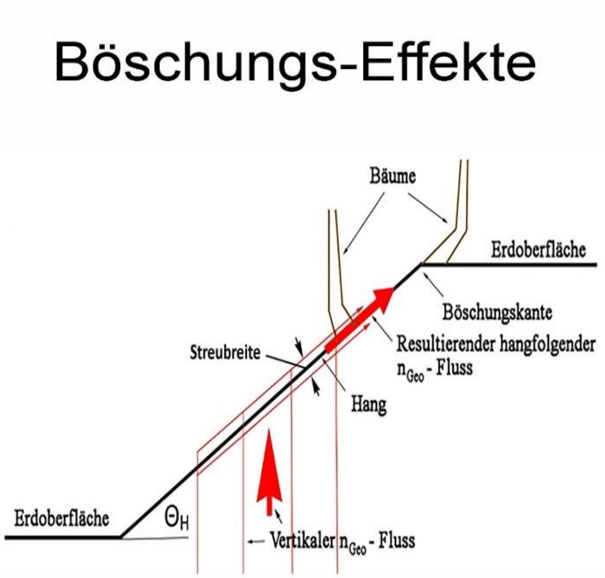


The Zwiesel effect of tree growth can therefore be explained as an early escape reaction of the tree.

Different models of scattering in the grazing beam path (inclined growth, bark effects, bumps, tree cavities, embankment effects) as a result of spatially specific, near-ground n_{Geo} beam structures and diffuse n_{Geo} currents may deepen the understanding of neutronotropy:

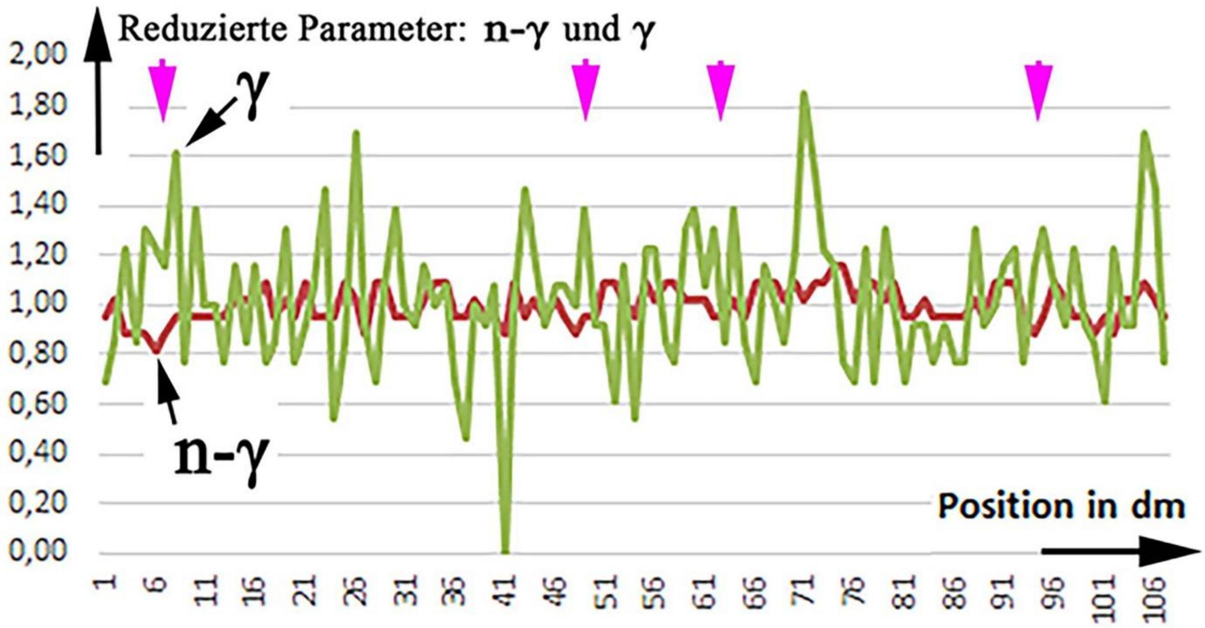






We are now turning to the numerous nuclear radiation measurements at elite locations (with information on data evaluation and selection of the measurement method). For various reasons, it was generally used with side-by-side measuring devices with which the n-ϒ mixed radiation and the ϒ radiation were recorded at the same time.

The diagram below shows an example of the (reduced!) n-ϒ and ϒ measurement data along a straight measurement line of approx. 10 m in length on grass soil (i.e. far from a tree location) have been determined for comparison. The respective distance from the starting point being given in decimeters. A certain local correlation of the data is found. However, the values of the available simple ϒ pulse counter fluctuate much more than that of the sensitive n-ϒ measuring device (plastic scintillation counter), and there are places (purple arrows) with opposite tendencies. The data of the n-ϒ measurement were therefore favored, but without the simultaneous ϒ measurements for comparison. For "calibration" or for an adequate comparison in the measuring field, a neutron dosimeter was also used but only at selected measuring stations (because the very long measuring time in such cases!):

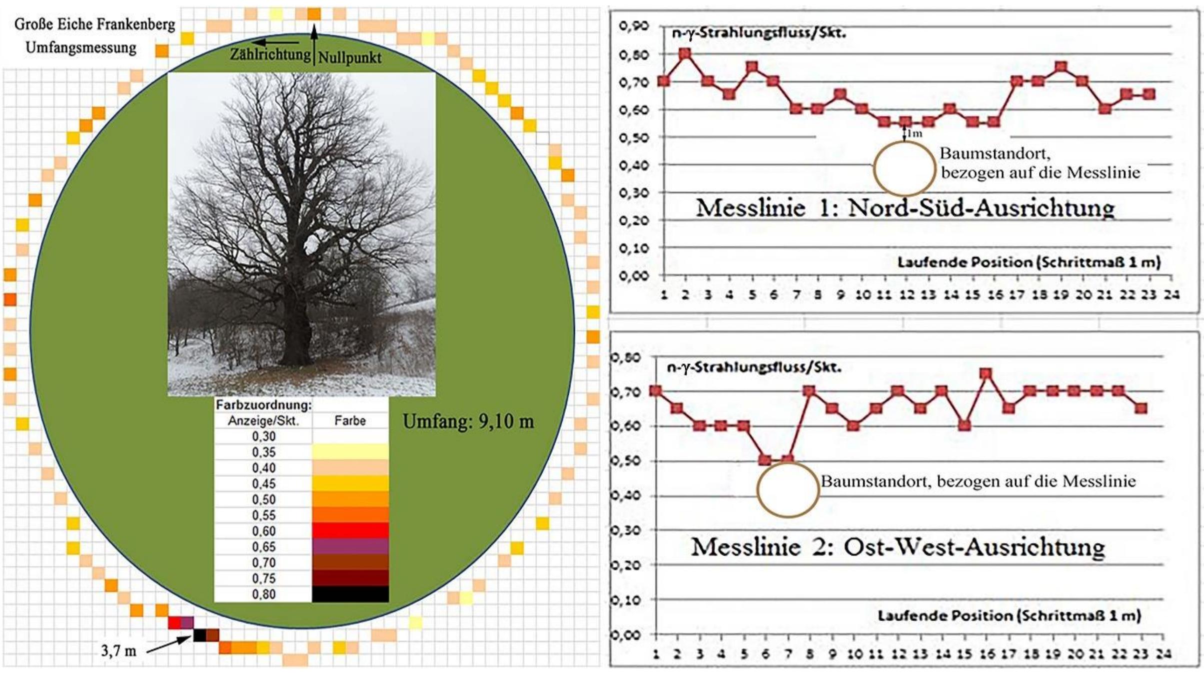


Measurement results at the locations of selected trees:

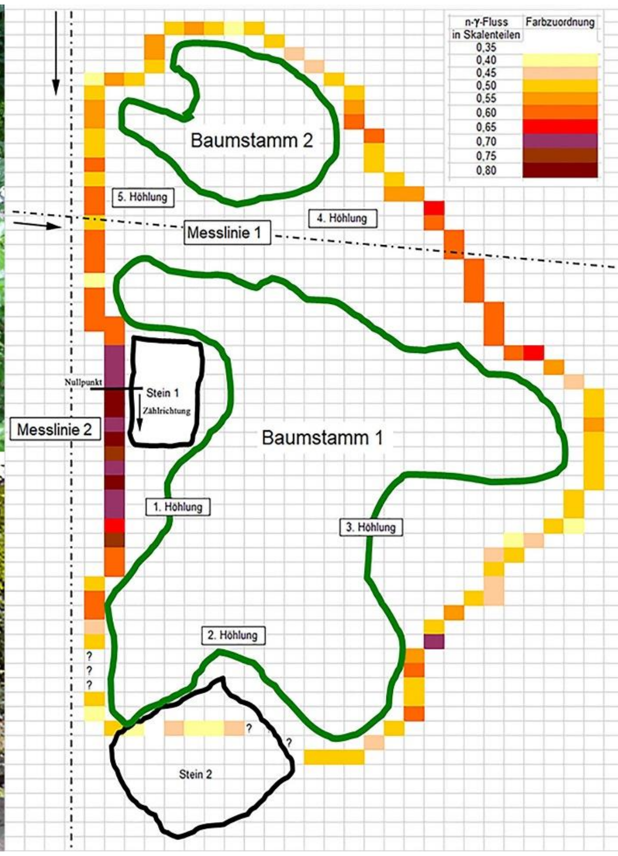
A circumferential measurement (directly at the tree trunk) as well as several linear measurements (crosswise close to the tree trunk) with additional selective n-measurements have proven themselves as standard procedures at the tree location. In some cases, to be on the safe side, measurements were carried out at intervals of several years.

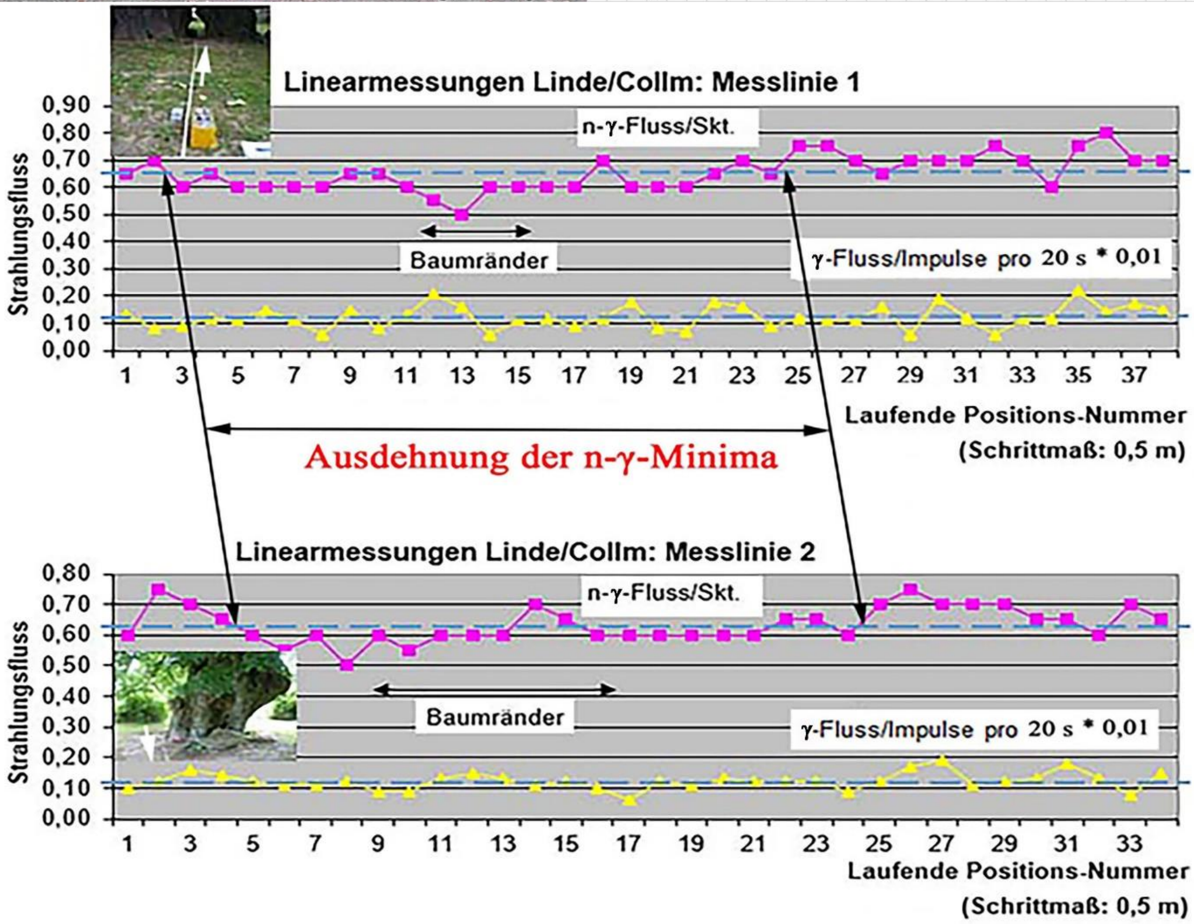
Note the relative n-gamma minima at the elite tree locations, because low neutron density means in the case of neutronotropy high growth rate of the tree (elite-effect).

Large oak tree at Frankenberg

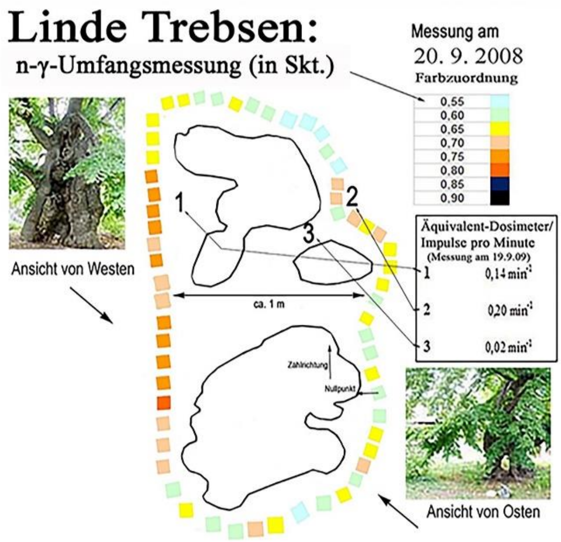


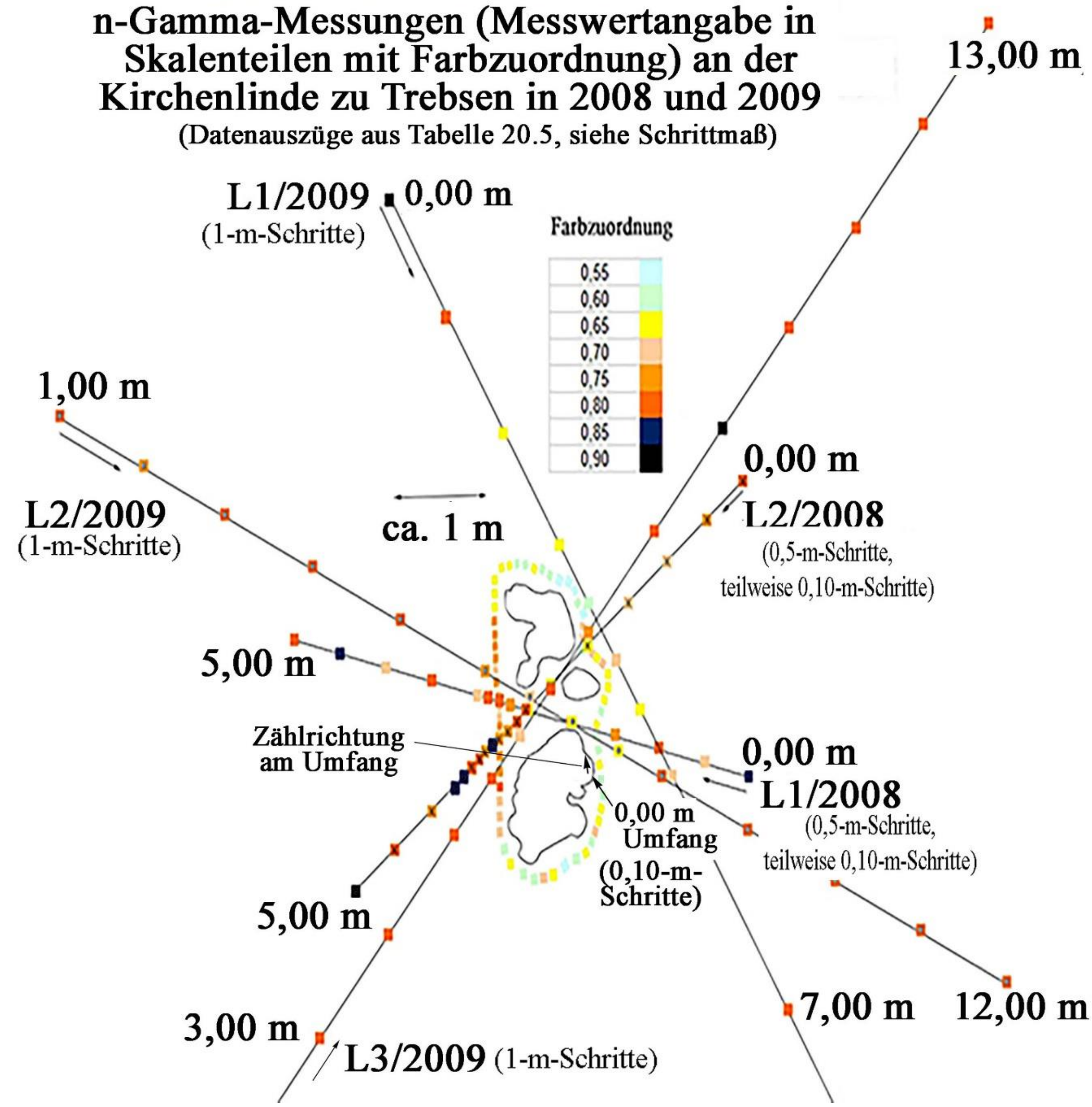
Cemetery linden tree to Collm





Cemetery linden tree at Trebsen

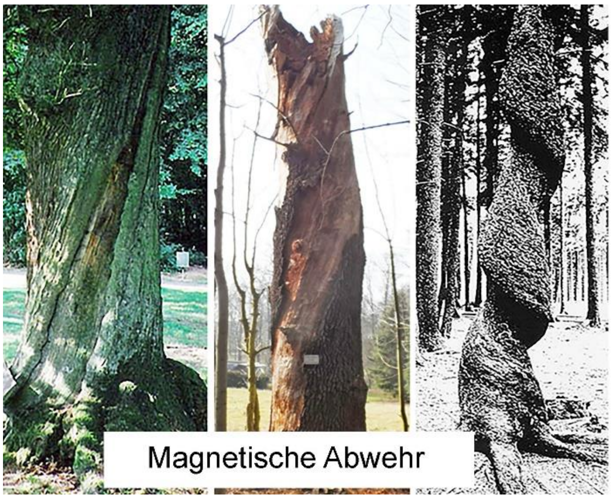


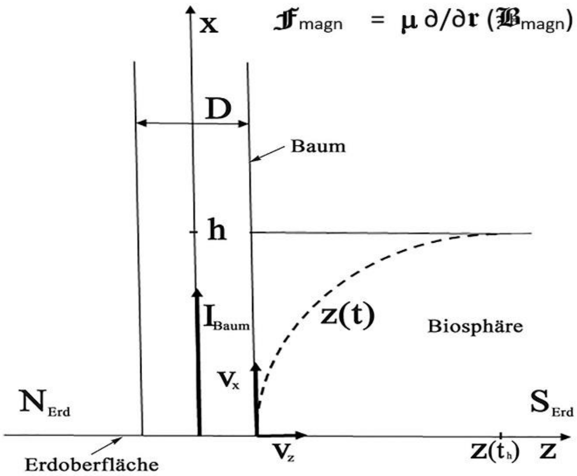


To explain numerous growth phenomena, theoretical investigations were also carried out or model ideas developed, which of course will have to be checked by measurements in the future.

These include the rotary growth, the false node, the spiral growth and the tree bridge as striking extreme examples.

Model calculation "magnetic n_{Geo} defense"

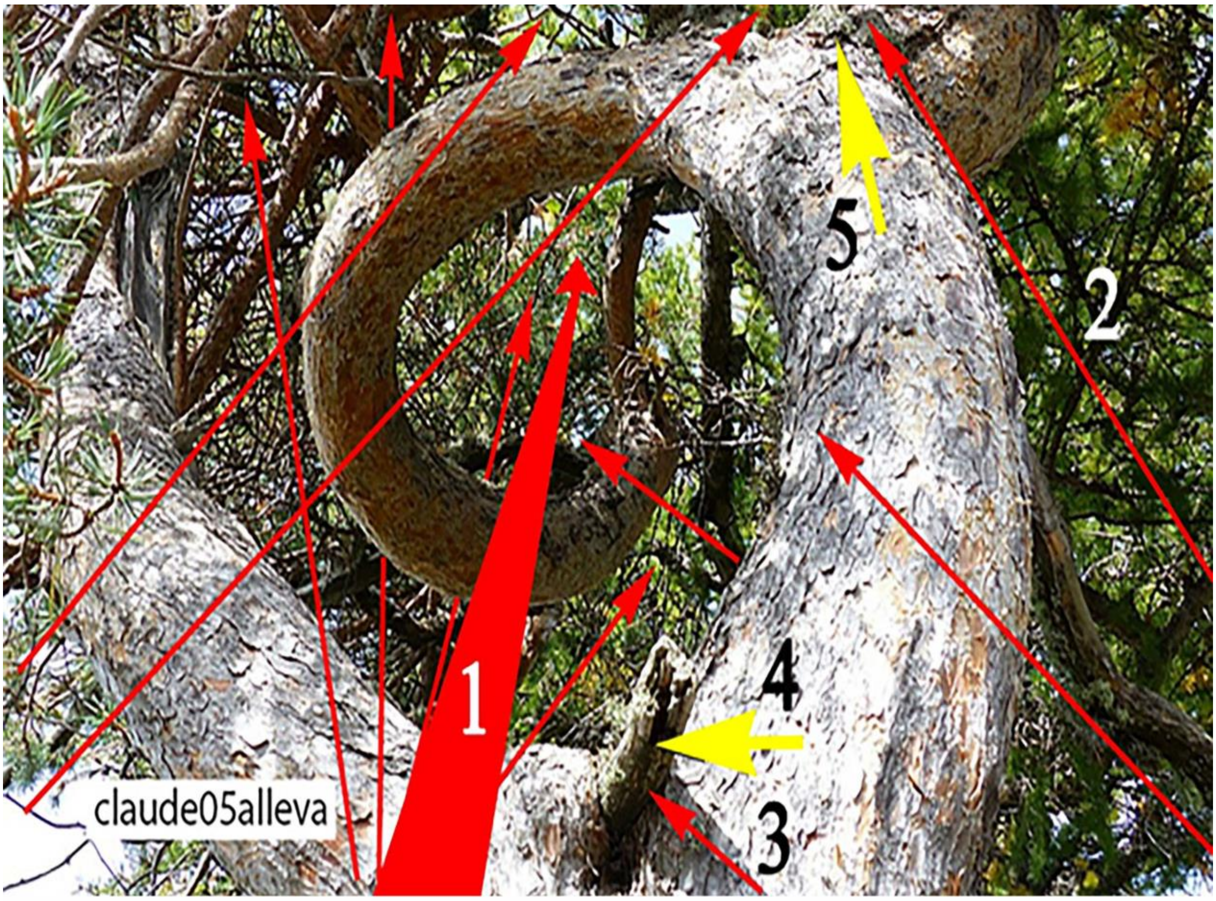




The false node

Spiral growth and other phenomena as neutronogenic constraints

The first photo explains the spiral growth as an escape reaction from different n_{Geo} rays. The second photo documents another extreme predicament, which can be interpreted as the opposite escape reaction of both trees in the structured n_{Geo} field:



The tree bridge phenomenon

Such extreme bridges between two trees - one tree even had to give up its individual existence completely here - can be explained with n_{Geo} beam structures and other neutronogenic effects as escape reactions at the two tree locations: