

Eddington's Parable (1939)
and
the Present Scientific Status of the Psychiatric Q-EEG

Gerald Ulrich, 2009 (unpublished manuscript)

In order to point out how science may prevent itself from gaining new insights lying immediately before eyes, the famous astrophysicist E. invented the following parable (see „The Philosophy of Natural Sciences“. 1939):

After decades of intensive research an ichthyologist pretended to have found a fundamental law of ichthyology:

Fishes are living beings with a diameter of at least half an inch.

The publication was celebrated as a major breakthrough. Nobody of his peers had any doubts about its truth. Only a close friend who was an ichthyological layman dared to ask (within a face-to-face-talk) about the width of fishing nets' meshes. He learned that every serious ichthyological scientist uses- of course - the scientifically standardized half an inch nets. No prestigious peer reviewed journal would accept an article for publication if an author would violate this profound guideline of the ichthyological society.

The friend's proposal to check the truth of the allegedly new fundamental law was rejected as unscientific metaphysical hairsplitting:

„What I cannot catch with my net lies beyond the bounds of ichthyological knowledge in principle; it does not refer to an object of the kind defined as an object in ichthyology“.

Additionally he stressed that even laymen are implicitly convinced since long of the truth of the newly scientifically proved insight - or had he ever heard from a fish market customer who demanded fishes being thinner than half an inch ?

It was totally inconceivable to our outstanding opinion leader and his peers that the result of any empirical research is essentially determined by the investigator's decision to make use of a particular measurement tool.

By this parable Eddington argued against the conviction of „naive empirism“ that man is principally able to recognize („see“) the nature as it **really** is.

Our „EEG-vigilance“-**framework** can be conceived in analogy to the ichthyologists' fishing nets. But there is also a decisive difference. A framework

is much more encompassing than any isolated mathematical transformation tool. Any kind of quantification has to be guided by and accommodated with this fundamental conception. Otherwise the results lack an interpretative basis.

Originally derived from qualitative visual gestalt-perception the EEG-vigilance framework delivers a sound basis (the only one which is imaginable to me) for the development of mathematical tools to **quantitatively reconstruct the originally given highly complex qualitative spatio-temporal information** – partially at least!

No mathematical processing of the EEG signal can be an end in itself. FFT, for example, does not deliver more clinically relevant information than the qualitative evaluation by a trained subject (hi Jay, Werner, Georges and others). Rather the contrary is true because the highly important information about dynamics is totally eliminated by FFT !!!

But power spectra are indispensable if they are regarded and used as intermediate steps in order to quantitatively reconstruct the original qualitative signal.

The results (given as numbers) of any quantification procedure are the more precious, the better they can be re-translated into the original spatio-temporal signal.

This re-translateability is the lackmus test of the usefulness of quantification tools in principle, notwithstanding the fact, that certain parameters (e.g. coherences) or especially differences between succeeding records are hidden to the „naked“ eye (even the trained one).