

Addendum to Gerald Ulrich: *The importance of the concept of vigilance for psychophysiological research*, *Medical Hypotheses* 27 (1988) 227-229  
(im Anschluß an das wissenschaftliche Symposium in der Psychiatrische Klinik der Universität Leipzig am 3./4. April 2008 zum Thema „**Vigilance regulation in psychiatric patients**“)

If one subsumes under *vigilance* such different terms, as *Alertness*, *Sustained Attention* and *Selective Attention*, one is in danger of the “categorical fallacy”. Sustained- as well as selective attention refer to certain measurable **performances** (resulting from a certain interaction between an living organism and its environment) and therefore to **psychology** (comprising all kinds of behavior, be it outward and inward directed)

Alertness, on the other side, be it tonic or phasic does not refer to any concrete performance. It refers to the disposition enabling a certain performance. This is the domain of **physiology** (the domain of organismic functions to be strictly distinguished from performances!)

The importance to distinct between the physiological and the psychological level of description can be demonstrated by an overwhelming amount of empirical findings excluding the naïve assumption of an unequivocally reversible matching. An intriguing example is the poor correlation between experienced fatigue and certain EEG patterns ( $r = 0.20$  or even less!), the so-called sleep inertia following awakening from sleep, or those subgroup of insomniac maniacs which exhibit drowsiness patterns in their wakeful resting EEGs.

## **Psychological phenomena are neither caused by physiological phenomena nor reducible to them.**

They rather represent logically and ontologically different categories of description, existing in coincidence (see Hughlings Jackson’s “Doctrine of Concomitance”). To state that the “power of thoughts” (mind etc.) steers physiological processes is not more than an unscientific *façon de parler* in colloquial speech. It becomes a misleading when it is taken as a scientific statement. A psychological state appears “coincident” with a distinct physiological state, but not as an effect of the latter or the other way round.

Thus, the notion of “psycho-physic interactions” has no scientific meaning. It’s just a way of colloquial speaking ([www.journal-fuer-psychology.de/jfp-3-2007-7.98.html](http://www.journal-fuer-psychology.de/jfp-3-2007-7.98.html)).

To Head “*vigilance*” was indispensable to explain both the clinical fact of spontaneous recovery of the CNS following damage, and the characteristic fluctuations with impaired performances.

The theoretical impact of Heads concept essentially remained unrecognized in the following decades.

Head's *vigilance* is neither a function nor a performance. It has the (semantic) status of an "explanatory principle" (Bateson).

"Explanatory principle" is synonymous to "Theoretical Construct" (Carnap), "Ordnungsbegriff" (Bente), or Kant's time-honoured "Regulative Ideen". Such terms are needed to explain other phenomena. They cannot be explained by themselves because they represent human creations. One may add that a term which cannot be explained by themselves cannot be defined operationally.

Whether one prefers to do without "*Vigilance*" (as recommended by B.S. Oken in his review article on vigilance, 2006, without mentioning Henry Head) on account of its different semantic use, or whether one regards "*vigilance*" as an indispensable scientific term depends on the epistemological position.

In avoiding further misunderstandings, it has to be stressed quite unequivocally that Head's *vigilance* makes only sense for a scientist, who is primarily interested in the reality behind the overt empirical phenomena.

If one, on the other hand assumes the strictly antimetaphysical mainstream position, accepting objectively measurable facts (to be grasped by our senses and introspection) as well as operationalized terms only, Head's *vigilance* must appear nonsensical.

Merit has to be given to Dieter Bente, who proved the practical usefulness, when he – already half a century ago - envisaged a concept for clinical EEG-research based on Head's *vigilance* by recognizing the EEG as an ideal physiological macroindicator thereof.

Bente's epistemological position seems somehow inconsistent, because he generally committed himself to the Logical Positivism (pure empirism). Notwithstanding he occupied a clear metaphysical position when he insisted on a categorical separation of physiology and psychology and their irreducibility as well. This might be the deeper reason of his largely unsuccessful endeavour to convince the scientific community of the heuristic value of Head's *vigilance* and his own conception of *EEG-vigilance* that was *based* on the former.

The psychophysiological EEG conception of Bente is in line with the epistemological foundation of neuropsychiatry that was initiated by John Hughlings Jackson and promoted by the most outstanding neuropsychiatrists and neuroscientists of the 20<sup>th</sup> century, as there are H. Head, D.O. Hebb, K.S. Lashley, H. Berger, K. Goldstein, V.v. Weizsäcker, H. Ey, K. Conrad to mention only the most important).

In this connection one should remember to Otto Sittig when he wrote many years ago, that it could be taken for granted that nobody except Jackson has thought more profoundly about the theoretical foundations of our discipline and

that it was wise to follow his traces. According to Sittig, Jackson's teachings were not the teachings of today but the teachings of tomorrow.

*(“Niemand hat vielleicht so tief wie Jackson über die theoretischen Grundlagen unserer Wissenschaft nachgedacht und darin sollten wir ihm folgen“. und weiter: „Seine Lehren sind nicht die Lehren von heute, sondern die von morgen“.*

Otto Sittig : Hughlings Jacksons Hirnpathologie. Nervenarzt 4 (1931) 473-482.