In memoriam Dieter Bente

Professor Dieter Bente, head of the Institute for Psycho-physiology of the Free University of Berlin and Senior Member of IPEG, passed away last fall. The fate which we had already once before seen with apprehension hovering over him finally carried him away in the midst of his work. When I am trying to offer an appraisal of his personality and his scientific achievements it is hard for me to gather and arrange the mass of upcoming memories. With him we lost not only a scientist characterized by depth of thought and by original ideas inviting many inspiring controversies, but also an open-minded, honest colleague and, above all, an always cooperative, warmhearted and witty personality who greatly contributed to fruitful interactions in conversations and discussions, yet, on the other hand, who clung unwaveringly to those convictions he had come to realize to be correct and sound.

Many of us have experienced the pleasure of meeting him in a relaxed atmosphere and to get to know his apt but never offending wit, his hearty, often sparkling humour, and were swept along by him who so much loved to laugh. On more than one occasion he impressed his partners by the breadth of his knowledge, his wide reading and his brilliant ability to connect ideas out of different spheres of thought, knowledge and personal experience, which exceeded his actual scope of work but quite often resulted in completely new insights.

Being himself a trained clinical psychiatrist, he has, constantly working and also constantly learning, not only participated in the development of basic research in clinical neurophysiology and in psychophysiology, but actually advanced these developments to disciplines with new methodological equipment and new meanings. In the areas of biology, geology, art history and early history, literature, the history of sciences and the theory of cognition he was very well-informed, well-read and interested.
Let me mention his scientific oeuvre with a few words in a respectful attempt of a critical evaluation. His list of publications includes 212 titles, which cover a broad range of thematically diverse topics. His reputation as one of the pioneers in electroencephalography is based on the numerous studies he devoted to the objectification of the effects of drugs on brain function. Many of his papers influenced the basic methodological developments of EEG analysis and, furthermore, dealt with documentation and the problems of multivariate statistics applied to the results of EEG analysis. They are primarily characterized by their focus on methodology. Quite in accordance with his all-embracing interest and competence, Bente applied the results of this specific direction of his studies to more general psychiatric problems. Without claiming complete coverage, the following selection of his works may serve as examples of Bente's activity — as, for instance, his studies on factor analysis concerning the structure of the interactions of psychiatric symptoms (1966), his critical evaluation of the methodology of applying multivariate procedures in cases of psychiatric symptoms (1969), his information-statistical studies on the structure of the sequences of simple actions in cases of psychoses (1979) or his studies on methodological aspects of the factor analysis of spectral EEG data (1980). But he also discussed general psychiatric questions as, for instance, the akinetic-abulic syndrome (1977) or in this last contribution, a study on pharmacopsychiatry and social psychiatry as alternatives of a system therapy of psychic disorders. Especially during the last 2 years, Bente has turned his attention to interesting new possibilities of the analysis of biological signals with his experiments to record the magneto-EEG as well as the cerebral magnetic manifestation of evoked potentials. The width of his interests is documented by his works on psychotherapeutic problems during drug treatment of psychoses.
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or by his quantitative text analysis regarding the alterations in language by Hölderlin during psychosis (1969). I cannot discuss in detail the many new aspects offered by these studies.

But without any doubt he was especially concerned with the research and application of a model the nucleus of which consisted of the vigilance concept developed by him, which he had based on the one published by Head (1923), improving it in a very original manner. Already in his first major study dealing with this subject, entitled ‘Vigilance, Dissociative Displacement of Vigilance and the Insufficiency of the Vigilance Tonus: A Contribution to the Psychophysiological Basis of Psychiatry’ (1964), he reveals the central direction of his theory, which he consequently took up again and again; he furnished further finishing touches and continued to develop it until his lecture at a last year’s symposium at Venice: ‘Electroencephalographic Determinations of Vigilance: Methods and Examples’. Let me try to sketch at least the development of this model with a few words.

In the above-mentioned study on vigilance, dissociate vigilance displacement and insufficiency of vigilance tonus, Bente states: ‘Our approach represents above all a theoretical model, which has the form and function of a combining practical hypothesis. Its worth and its validity therefore are determined according to the degree of its adaptation to clinical and experimental facts and its heuristic efficiency concerning the evaluation and classification of new facts. The function of this model consequently consists of its ability to unite isolated and at first sight contradictory findings into a logically consistent sequence of terms. The more a classifying force of such a conception can be verified by experimentally confirmed data and the more verifiable predictions can be deduced thereby, the higher its validity has to be estimated.’ This definition elucidates Bente’s way of thinking and his constant thriving, on the one hand, to abstract the actual finding by turning it into a generally valid model, constantly related to structural criteria, on the other hand, his attempt to project the model’s substance back on the level of psychophysiological and clinical research. In addition, he explains in another section of his study: ‘Seen from this point of view, it becomes evident that it cannot be the task and responsibility of pharmaco-electroencephalographic studies to limit the effects of drugs right from the start to isolated metrically easily accessible data but to observe and analyze the total of changes in the electrical activity of the brain. This conviction results out of the reflection that precisely those astonishing effects which indicate changes in more complex structures con-
tain decisive information on the influence of fundamental organic processes, the knowledge of which is of elementary importance to the evaluation of psychotropic pharmaca.’ This basic conviction expressed already 20 years ago contains warnings to the pharmaco-EEGists which have only too seldom been understood and which, still nowadays, have to be repeated again and again.

In his ‘Habilitationsschrift’ of 1964, Bente published in a bold design fundamentals dealing with the same topic. His well-rounded and comprehensive presentation which he gave at a Malta Symposium 3 years ago, entitled ‘Vigilance Regulation, Cerebral Psychosyndrome and Diseases of Old Age: A Psychophysiological Model’, demonstrates to what an extent his reflections had matured since then. Some characteristic paragraphs deserve to be quoted as well: ‘The English neurologist Head (1923) established a relationship between a neural system on the one hand and the variety and adaptability of its reactions on the other hand with the development of his vigilance concept. Vigilance, in the definition of Head, is therefore a neurodynamic quantity which determines the degree of organization of actual behavior and its adaptive level.’ And he continues: ‘This shows what we mean by the term vigilance and what function the EEG fulfills within the scope of this concept. Vigilance is a systematic dynamic quantity which manifests itself in forms of organization of the electrical activity of the brain. On the other hand, this quantity determines, as can be observed in the psychophysiology of the transitional stage between wakefulness and sleep, the dynamic level of information processing and information generating procedures which objectively expresses itself in the structure and adaptability of behavior, and subjectively is represented in the manner in which we experience ourselves and our environment. This structure of interactions which connects the electrical organization of the brain, data processing and patterns of behavior, whose inner structure equals Head’s conception, assigns to the EEG the function of a predilective indicator of vigilance.’

Bente has experienced quite a lot of criticism concerning his vigilance concept which must have hurt him all the more since it obviously arose from a lack of conceptual comprehension of the overall meaning of this concept, a meaning which left the narrow framework of vigilance in an everyday sense far behind and which aimed at an overall classifying way of thinking and overview of EEG manifestations, organization of performance and behavior in terms of a dynamic structure of functions. This kind of integrative thinking which he had already recognized as correct 2 decades ago and which he unwa-
veringly clung to runs through his complete oeuvre as a kind of red thread. Once more, a consequence which he had stated in all clarity at the Malta Symposium 3 years ago may be alluded to: “Proceeding from this concept, which offers the key for a level-adequate analysis and interpretation of the patterns of cerebral activity, we reach certain methodological claims which are of prime importance to the essence of an electroencephalographic experiment. Right from the beginning of the era which brought us the advent of signal analytic procedures into electroencephalography, I have pointed to the fact that frequency and voltage are without any doubt fundamental parameters of EEG activity, but that their definition can only lead to qualified conclusions when they are conducted within a study of comparing patterns. Only an analysis which properly takes into account the level of organization, the structure and dynamics of cerebro-ec-trical patterns will enable us to draw sufficiently differentiated and interpretative conclusions on the kind of
patho- and pharmacogenic changes of cerebroelectrical behavior.

It would imply to narrow down Bente’s way of thinking if we limited his statement to the EEG and its interpretation which he, in this case, obviously only wanted to be understood as an especially conspicuous example. It was not granted him to perfect this physiological electroencephalographic vigilance concept and to connect it with the developing theory of synergetic systems tending to be self-organized which has been introduced to us by Prigogine – a connection Bente obviously had in his mind. Maybe this is the heritage he has left to us and which will be a challenge for quite some time to come. The most proper way of keeping Bente in kind remembrance as well as keeping his way of thinking and his scientific activity alive may well be to accept this challenge by critically re-evaluating it.

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