Dr. Albert Gerber, a European Pioneer in the Craniomandibular Field

On November 2, 1987 one of the most influential European figures in the study of TMJ disorders and removable prosthodontics celebrated his 80th birthday. It would not be presumptuous to consider Dr. Albert Gerber a European pioneer in the field.

Dr. Gerber's first academic appointment was at the University of Bern, 1942. In 1953 he was named chairman of the University of Zurich's Department of Removable Prosthodontics, made famous worldwide by Professor Gysi's work on occlusion.

Gysi's occlusal theories had a tremendous impact on Gerber, his spiritual heir. In 1973 Gerber published the following introductory remark on his predecessor: "He was disturbed by the realization of not being able to adjust an artificial dentition into an harmonious interplay with mandibular movements. Because of this concern, he began a very intensive research on occlusion, temporomandibular joint and jaw movements." The same concern pushed Gerber to start his own studies on occlusion and mandibular movements. These studies led him to suspect that available articulators did not provide a close enough approximation of natural mandibular movements, nor did they take into consideration some of the most important findings on jaw motion, i.e., the Bennett and the retrusive movements. Gerber considered Bennett's moving axis theory crucial for the construction of an articulator capable of faithfully reproducing mandibular movements. He was also concerned with the too small movements' envelope of the available articulators. Therefore, artificial occlusions adjusted in these instruments often caused interferences. These criticisms lead to the development of a new articulator able to reproduce by simple means the shape and the envelope of movements of the TMJs. This articulator, at first called Translator and now Condylator, had from its inception a simple three-dimensional condylar guidance mechanism that allows the incisal guidance table to be dispensed with a mandibular movement guide. This design produced a completely new articulator able to reproduce all movements, including the Bennett's and retrusive ones. Most articulators available, then and now, are derived from Gysi's and Hanau's idea. The Gerber Condylator is a departure from that approach and is perhaps the first of a second generation of articulators, as White wrote.

To explain the functional relationship between the different components in the masticatory system, Gerber often used Gysi's drawing of four geared sprockets representing the functional interplay between condyles, molars, bicuspid and incisors. He always pointed out that the drive of the gear system, i.e., muscles and the nervous system, were missing. This remark indicates Gerber's concern...
that so many occlusal theories were too mechanically oriented and did not consider the physiological requirements of the system. So he always opposed the gnathologic concept of centric relation as being the most retruded jaw position. He considered it an unphysiological one and, as such, a possible cause of TMJ disorder. His definition of centric relation is, to my knowledge, the first one to also take soft tissues into consideration: “In maximum intercuspation and with the head upright, both condyles are in the centre (zenith) of the fossae. Enough space for the articular disc and the two intact cartilage layers must be present between the bony joint compartments. Furthermore, the tissues in and around the joint may not be compressed, neither may they be subject to traction” (Gerber, 1971).

Harmonious interplay between TMJs and occlusion is, for Gerber, of primary importance, not only for optimum joint loading, but also for physiological neuromuscular state. Consequently, the establishment of a morphofunctional harmony between the occlusion and the TMJs, and therefore the recording of a physiologic condyle-disk-fossa relationship, has a primary importance in his treatment approach. In the presence of joint pathology, as when the condyle is posteriorly or superiorly displaced, it is impossible to record this jaw position. TMJ radiographs and the resiliency test (Gerber, 1971) are the additional tools that he considers necessary to diagnose whether the recorded jaw position is physiologic or not.

Although being an advocate of the radiologic concept of condylar concentricity, he always mentioned the difficulties in interpreting the radiographic condyle-fossa relationship, in particular, that in a transcranial radiograph a narrowing of the joint space or part of it is never a sign of condylar displacement, because the narrowing is often caused by an erroneous projection. Only an enlargement of the joint space allows the diagnosis of condyle-fossa misalignment, a message that was not considered enough in the literature. Furthermore, he never judged the condyle-fossa relationship only from a radiograph but always by comparing it to radiographs taken with different jaw positions, i.e., in centric occlusion and in the recorded position. Aware of the artefacts of TMJ radiology, he introduced the use of fluoroscopy as a means to obtain radiographs in individual projections.

Because of the limitations of TMJ radiology in diagnosing a superior condylar displacement, he developed in the 1960's the so-called resiliency test (Gerber, 1971). While the patient is biting on tin foils of different thicknesses placed in the premolar area, the dentist checks with shim stocks on the contralateral molar area the presence or absence of occlusal contact. The diagnosis of superior condylar displacement, i.e., of joint compression, is made when the molar contact is absent already with a tin foil thickness of 0.3 mm. For the treatment of compressed joints, he added to the Condylator another innovation, a vernier allowing him to increase the vertical height of the articulator side plate. His concept of actively unloading a compressed joint by occlusal means has been adopted by several schools since then.

Gerber’s scientific achievements occurred in a period when the only gnathologic concepts considered correct were based on the reproducibility of the hinge axis, on the need of localizing it for occlusal rehabilitations, and adjusting the occlusion to the most retruded position. Because of his physiologic background, he always opposed such mechanical concepts, but it was several years before his ideas were recognized. In this way he can be compared with another pioneer in the field of craniomandibular disorders, the late Dr. W.B. Farrar. Both, one in Europe, the other in the U.S., battled for a
physiologic approach to occlusion and the TMJ problem.

Dr. Gerber is a thorough clinician who dedicated his life to helping patients. Research has for him a sense only if it is related to alleviating the patient’s suffering. He is a man of inborn intuition, of altruism, of strong personality and charisma, of constructive criticism, and of modesty. The need for criticism, for not taking any theory, even his own, for granted, and for helping patients, allowing him such a significant contribution in our field. We should be grateful and proud of him for having dedicated his life to improve our knowledge of cranio-mandibular disorders.

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References