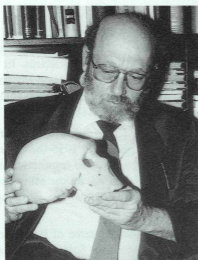


# Morphology and Methodology

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o.Univ.Prof., Dr.phil. (University of Vienna 1972)



### Research

With the discovery of the Tyrolean Iceman a new and innovative period started. In cooperation with the Department of Radiology II (Dieter zur NEDDEN, University of Innsbruck) new methods for CT-image processing, first of all stereolithography, were adapted and made available for physical anthropology.

This has been the basis for further developments in biomathematics and biostatistics in the field of morphology and morphometry.

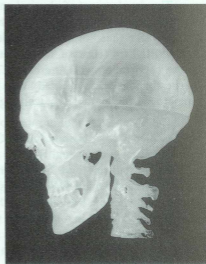
### *Stereolithography*

The last stereolithographic model of the skull of the Iceman including the reconstruction of parts of the vertebral column gives evidence of the deformation caused by the flow of the glacier. New methods have been developed to describe in a mathematical way the quality of skull deformations.

Following the stereolithographic reconstruction of complete skulls a new field of research is opening up: Palaeo-Neuroanthropology. It is now possible to judge the internal anatomy of skulls with-

out damaging them. So we reconstructed the mid-pleistocene skull of Petralona. The stereolithography also allows insights into the endocranial morphology and therefore is an essential tool for the interpretation of the evolution of the human brain.

Another application is the morphometric reconstruction of the cranial remains of the Neanderthaler of Le Moustier. All fragments out of which the traditional reconstruction has been made have been reconstructed stereo-lithographically using a special software and without destroying the original.



**Fig. 1.** Stereolithographic model of the skull of the Tyrolean Iceman (zur Nedden, Seidler et al 1995)

### *Morphology*

One of the main programs (in cooperation with the Austrian Academy of Sciences) concerns the morphological and morphometric work on the Rudolf PÖCH skull collection. This collection includes some hundred skulls of Bushmen, Aborigines and Papuas and is one of the most precious collections of the world. These skulls are singular since they represent homogenous populations not existing

anymore today. In addition to the morphological investigations trace element analyses will complete this research work.

### Methodology

The primary question here is the relevance of applications of biostatistical and demographic methods, first of all of correlation analyses. New methods in biostatistics are developed and their significance will be examined using a large amount of material such as the yearly data of the Austrian Statistical Central Office and the data sets of calling up of the Austrian Army.

### Teaching

Introduction to Human Biology for students of all branches of Biology (two hours)

Human genetics (four hours) under special consideration of clinical genetics

Human evolution (four hours); Human anatomy and physiology (four hours)

Social anthropology (two hours); courses in morphology and osteology (four hours), practicals in osteological techniques and preparation of skeletons (ten hours)

### International Cooperations

State University of New York, Anthropological Dep.; SUNY-Albany (USA); - Wake Forest University, Winston Salem, NC (USA); - State Museum Berlin, Dep. of Palaeontology (Germany); - University of Göttingen, Institute of Anthropology (Germany); - University of Florence, Anthropological Institute (Italy); - University of Zagreb, Anthropological Institute (Croatia); - University of Thessaloniki, Institute of Palaeontology (Greece); - University of Madrid, Dep. of Palaeontology (Spain); - University of Bochum, Medical Faculty, Dep. of Functional Morphology (Germany)

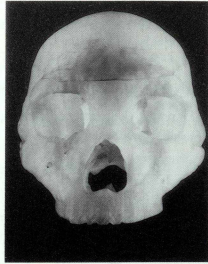


Fig. 2. Stereolithographic model of the Petralona Skull (Seidler, zur Nedden 1995)

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