
Studying the joint evolution of the skull and brain in Homo species

Lou Albessard-Ball^{*1}, Antoine Balzeau^{1,2}, Stanley Durrleman³, and Dominique Grimaud-Hervé¹

¹Muséum national d'Histoire naturelle (MNHN) – CNRS : UMR7194, Muséum National d'Histoire Naturelle (MNHN), Université de Perpignan Via Domitia – France

²Royal Museum for Central Africa [Tervuren] (RMCA) – Belgique

³Aramis lab – Institut National de Recherche en Informatique et en Automatique, Sorbonne Universités, UPMC : UMRS 1127, Inserm : U1127, CNRS : UMR7225, ICM, Paris – France

Résumé

Cranial features have long been favoured by palaeoanthropologists as clues to reconstruct the story of human evolution. The relative abundance of skulls in the fossil record, as well as the high number of diagnostic features which can be observed on them, makes them robust objects of enquiry. Perhaps equally important in the history of studying fossil crania is

the consideration that the development of large brains and of complex cognition is among the

major characteristics of human evolution. As "being human" means thinking like a human, the evolution of brains in fossil hominins and in *Homo sapiens* draws considerable attention. The study of endocasts - their volume, general morphology, convolutional patterns, and the development of cognitive areas recognised in extant humans - may have little to tell us in terms of function, but it does allow for the identification of derived characters with potential phylogenetic and evolutionary value. Because of the high morphological integration between the outer vault of the skull and the endocranium, it is difficult to list reliable independent diagnostic features for these two aspects of the head. The pressures on skull morphology may

relate to environmental changes, diet, modifications of the sensory organs, brain development, or the use of language, whereas the brain undergoes reorganisations which may be due to the

development of cognitive areas. There is however very little literature concerning the joint evolution of the skull and endocast. We will discuss this topic through examples including morphometrical data derived from a sample of extant and archaeological *Homo sapiens*, and fossil hominins (*Homo erectus*, Neandertals, Mid-Pleistocene *Homo* specimens). Thanks to these data, we will be able to discuss the relationship between the morphologies of the skull's outer vault and the endocranium throughout the evolution of the genus *Homo*.

Mots-Clés: Palaeoanthropology, Palaeoneurology, Homo species, Morphometrics

*Intervenant