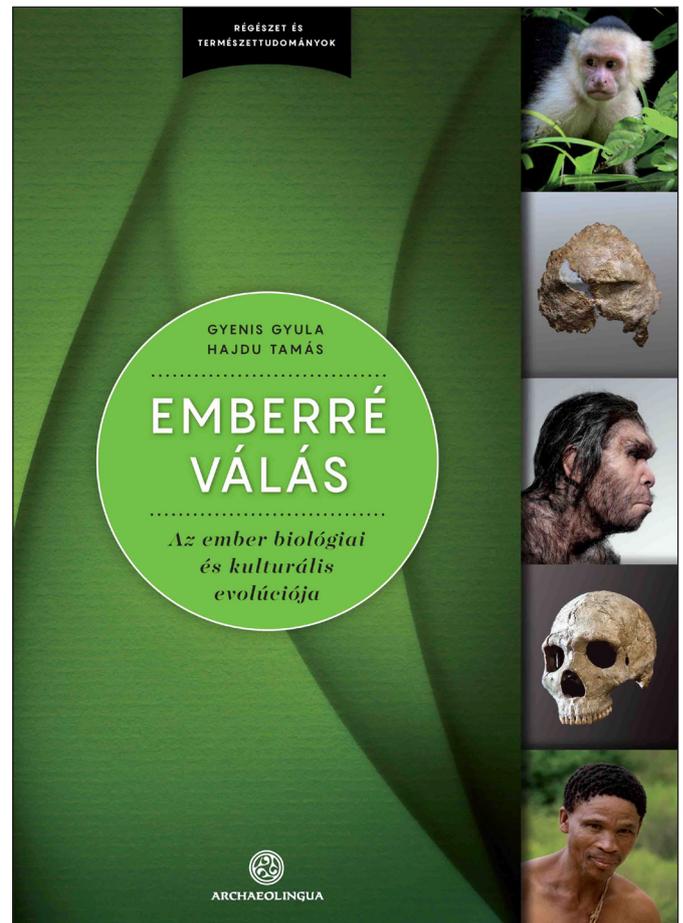


## EMBERRÉ VÁLÁS. AZ EMBER BIOLÓGIAI ÉS KULTURÁLIS EVOLÚCIÓJA [BECOMING HUMAN: THE BIOLOGICAL AND CULTURAL EVOLUTION OF MAN],

ZSOLT MESTER

*Who are we? Where do we come from? Where are we headed? These questions have occupied the mind of humankind since the dawn of consciousness. Throughout history, all cultures formulated their own mythological, religious, or philosophical interpretations. Inquiries into modern scientific explanations got underway in seventeenth-century Europe: by the nineteenth century scientific thinking arrived at the conclusion that present wildlife must have emerged as a result of a continuous evolution, and human development was an integral part of this process. Yet human culture itself was a key factor to the transition from hominids to modern humans—culture and biological evolution are closely interlinked and therefore numerous disciplines in the sphere of the natural sciences and the humanities are immersed in the scholarly exploration of human evolution. Among these, anthropology and prehistoric archaeology are almost inseparably entangled. This joint publication of Gyula Gyenis and Tamás Hajdu is a perfect overture for the new Archaeolingua series that aims to demonstrate how archaeology and the natural sciences are interconnected.*

The volume is intended for university use as a textbook, and in this regard it has some esteemed predecessors. The book *Emberré válás. Az ember biológiai és kulturális evolúciója* [Anthropology and human evolution] by Pál Lipták (Budapest: Tankönyvkiadó, 1969 and 1971, 283 p.) served as an indispensable cornerstone for decades—even the author of this review made use of it while preparing for his exams in the early 1980s. The 1970s brought a fresh wave of interest in hominid remains, especially in East Africa. International expeditions brought further bone fragments to light, including quite a few decisive ones, such as the early hominid christened Lucy. These findings deeply transformed our understanding of hominids, and the above-mentioned university textbook had to undergo fairly extensive modifications (revised edition: Budapest: Tankönyvkiadó, 1980, 351 p.). The boom of paleogenetics in the 1990s turned a new page both in historical anthropology and in the research of human evolution. It was time for an update of the whole curriculum: the book *Humánbiológia: A hominidák evolúciója* [Human biology: The evolution of hominids] by Gyula Gyenis (Budapest: Nemzeti Tankönyvkiadó, 2001, 226 p.) was put out. Gyenis preserved the basic structure of Lipták's discussion of human evolution but at the same time he updated the presented facts and



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revised the way they were put forward. However, only one and a half decade later another serious revision proved necessary to keep education in line with scientific progress; this attests to the exceptional pace of advancement in the field. The recent joint undertaking of Gyula Gyenei and Tamás Hajdu may, so to speak, be appraised as a symbol of ‘the evolving generations of textbooks.’

The volume is published in A4 format and runs to 270 pages. The authors use plain, intelligible language yet they introduce an extensive vocabulary of technicalities and scientific names of species. This makes the book a highly recommended reading for both university students and a wider public. For those eager to immerse themselves in the details, the meticulous bibliography and references in each chapter will serve as a convenient starting point. Twenty-eight figures, fourteen tables and further 113 color as well as black and white illustrations accompany the well-structured and highly informative text.

Morphological similarities between apes and man captured the attention of the scholars of old. Through a dissection of Barbary macaques, the famous physician Galenus demonstrated how these similarities extended beyond mere morphology and were shared by the whole organism. The knowledge he thus gained became the foundation for his teachings on human physiology. Vesalius, the sixteenth-century scholar drew up a comparative anatomy of the two species. It comes as no surprise that in the eighteenth century Linnaeus classified apes and man in the same taxonomic category, in the order of primates (*ordo Primates*). Scholars have been aware of the hereditary connections behind taxonomic likeness since the nineteenth century, and modern genetics conveyed a dramatic paradigm shift in scientific research.

In order to grasp human evolution one must understand the evolution of primates. The book by Gyenis and Hajdu takes on this task. First they provide an introduction to the general characteristics of apes, from their morphology to their habitat, movement, communication, and the use of tools. A fascinating world is revealed and it gets even more intriguing when the taxonomy and behavior of present-day primates is explained, from Prosimians to apes. The carefully picked color photos almost bring these animals to life. The concluding chapter of this part offers an overview of recent advances in molecular biology and their consequences for taxonomy. This discussion of cutting-edge scholarship adds a novelty value to the volume: research papers on these topics are to be published shortly and thus the book smoothens the way for the reception of new findings. Sure enough, the upswing of genetic research will result in completely new debates in a few years’ time.

How have primates evolved into the animals we know today? Fossils, i.e., petrified remains of primate bones, have the potential to shed light on this question. Before turning to the evolution of primates on different continents, the authors first clarify the basics, such as the process of fossilization, the methodology for dating finds, the molecular clock, or the geological timescale. Almost a whole page is dedicated to finds discovered in Hungary, such as the *Rudapithecus*.

After this introduction the volume offers a comprehensive narrative of the evolution of hominids. Here the authors refrain from applying highly debated taxonomic categories, but pros and cons are presented for the classification of species or even whole genera. This helps to orient the reader among scientific names that no longer are in use but pop up here and there in the older literature, and the corresponding fossils of which are still preserved in museum collections. Hominid bones are millions of years old, usually fragmentary, and poorly preserved; complete skeletons are absent even for the Neanderthals, a species that went extinct relatively recently, only thirty thousand years ago. Another reason behind the taxonomic debates is the presence of individual differences on bones of the same species: just as with present-day animals, hominid bones come in different sizes and shapes. This is further complicated by mosaic or modular evolution, i.e., the occurrence of evolutionary changes in body structures without a simultaneous, corresponding evolutionary change in other body parts at the same rate. The ambition of paleontologists to discover new species also fostered the creation of various taxonomic names—many scholars have been inclined to invent taxa once the unearthed remains invited them to.

The phases of evolution serve as a framework for the discussion of hominids, which gives the book a straightforward structure that is easy to follow. This idea comes from the late Andor Thoma, a distinguished anthropologist, who classified *Homo sapiens* remains into three different evolutionary phases according

to the level of advancement of certain traits. Gyula Gyenis extended a revised version of this system of classification to all hominids; in his previous textbook that was put out in 2001, he adopted four phases: Praeanthropus, Archanthropus, Palaeanthropus, and Neanthropus. This approach proves enormously fruitful from the point of view of archaeology, because these phases fairly correspond to archaeological periods of human culture. The evolutionary process being embedded in geological history, the authors also put forward the agreed-upon geological periods of the Pleistocene, based on climatic and environmental changes. To make the chronology absolutely clear, there is a comprehensive chart where all nomenclature is summarized (Table 6 on p. 63).

The next chapters scrutinize the fossil remains of hominids in each evolutionary phase; this part of the volume alone is exhaustive enough to function as a reference book. Findings are discussed according to phases and continents: the reader learns where and when these were discovered, what bone fragments came to light, what are their most significant morphological features, how did the given hominid look like, when and in what environment they thrived, how they lived and behaved, and what scientific debates have been focused on them. Readers who wish to learn more about the archaeological remains or study the scholarly disputes further, will find guidance through the references in the text. The volume would serve as an even better reference book were it equipped with a proper index of terms and names.

Early hominids of the Praeanthropus phase are presented through various findings, such as the earliest fossil, *Sahelanthropus tchadensis*, discovered in Chad, or the *Ardipithecus ramidus*, a species with an uncertain taxonomic classification. The *Australopithecus*, a species on the other branch of the hominids' phylogenetic tree, is undoubtedly the most renowned in this evolutionary phase. Nine species are described in detail, and the chapter sets forth their biological diversity in East and South Africa that made successful adaptation possible for three million years. The Archanthropus phase includes early species in the genus *Homo*, from *H. habilis* to *H. erectus*. This phase is regarded as the dawn of culture and therefore it is of particular interest for archaeologists. Until very recently, *H. habilis* was considered to have laid the foundations of human culture, because the age of the earliest stone tools, dated ca 2.6 million years BP, coincides with the emergence of this species. A few years ago, however, stone tools dated to 3.3 million years BP were discovered in East Africa, which suggests that human culture in fact goes back to the time of the *Australopithecus*, a species previously viewed as incapable of such inventions. Scholars, however, must be careful in formulating new hypotheses, and so they await additional discoveries before this contradiction can be solved. The adaptation potential conveyed by the emergence of culture facilitated the spread of the prominent hominids in the Archanthropus phase, i.e., the *H. erectus*, from Africa to the entire Old World, from South Africa to the British Isles and Indonesia. The *H. heidelbergensis*, whose brain size amounted to 1,400 cm<sup>3</sup>, played a pivotal role in the evolution of modern humans; they were highly developed hominids, the predecessors of *H. neanderthalensis* and *H. sapiens*. "Samuel," an individual whose remains came to light at Vértesszőlős in present-day Hungary, was a member of this species. *H. neanderthalensis* still belongs to the Paleanthropus evolutionary phase, while *H. sapiens* is the only species labeled as Neanthropus. Neanderthals are the most famous 'cavemen,' well-known to the wide public. Archaeological finds reveal that both their cultural development and their brain size (1,500 cm<sup>3</sup>) was comparable to that of *H. sapiens*. A separate chapter is dedicated to the theories about their extinction. The discussion of the Neanthropus phase draws upon Pleistocene bone remains; it goes without saying that uncountable *H. sapiens* skeletons are available from the Holocene, our present geological period. From the Hungarian assemblage, an occipital bone found in a rock alcove at Görömböly-Tapolca is mentioned in the analysis.

The advent of anatomically modern *H. sapiens* opened up new avenues for human development. Previously unreachable territories, such as Australia, the Americas, and Oceania, started to be populated thanks to the species' new adaptation potential, and new aspects of culture became apparent, art being one of these. These perspectives of continuous evolution are present in our own lives through inventions such as airfare, digital technology, the world wide web, genetic engineering, nanophysics, or the exploration of space.

The fact that 'contemporaries' of the *H. sapiens*, the Denisovan hominins and *H. floresiensis*, are *also* touched upon, demonstrates the authors' intent to present an up-to-date synopsis of the topic. Only one

finger bone fragment and a molar tooth have been identified as remains of the Denisovans so far. These turned up in the Denisova Cave in West Siberia; paleogenetic analyses attest to the survival of their DNA in the recent human genome. The skeleton of a ‘dwarf’ in the Liang Bua Cave on the island of Flores, Indonesia, has sparked fierce scholarly debates: it is uncertain whether it represents a late descendant of *H. erectus* or, rather, a pathological specimen of *H. sapiens*.

The origins of modern man is, beyond doubt, the most important of all questions concerning our species’ identity. A separate chapter is dedicated to theories on who we are and where we come from. Early hypotheses from the late eighteenth and early nineteenth century were heavily biased and influenced by colonial policies, as differences between the ‘races’ were viewed as evidence of inferior and superior origins. The discovery of fossil bones from the early nineteenth century paved the way to a more scientific discourse of human development. Hypotheses of polycentric evolution and models of monogenesis are both presented in the book, as well as the relations revealed by the ever-growing field of genetics.

Even the book’s subtitle emphasizes that becoming human is both a biological and a cultural process—this interconnection has been mentioned a few times in this review as well. Of course, the anthropologist authors of the book could not aim for an exhaustive discussion of cultural evolution, as it is in the focus of various other disciplines from the archaeology of prehistory to evolutionary psychology. They could not avoid, however, touching upon a few critical steps in the progress of human culture in order to shed light on ‘the fabric of bio-cultural development.’ Therefore, the similarities between the social behavior of apes and humans, sexual dimorphism, pre- and postnatal development, bipedalism, foraging, the invention of stone tools, the evolution of the brain, the evolution of dwellings, the regular use of fire, clothing, the emergence of language, and beliefs and rituals (cannibalism, burials, arts) are under scrutiny in the next chapters of the volume. This synopsis is really valuable for the reader, and it is very much hoped that this, equally enthralling, aspect of human progress will be summarized in a similar monograph soon.

It was also the authors’ undertaking to offer a compendium of the present-day biodiversity and anthropological character of *H. sapiens* as the end result of the evolutionary process. In addition to geographical variations and their origins, the authors briefly discuss racism and the relevant scientific debates. Enthusiasts of anthropology will find much delight in browsing through the chapters on present-day human geography. The descriptions are often complemented by archive photos from old anthropological treatises from all over the world, which makes this part of the volume especially unique.

For two million years the genus *Homo* lived as hunter-gatherers; for some, however, this is still the main means of subsistence. The dawn of food production undoubtedly brought about a paradigm shift and had a transformative impact on both the biological and the cultural evolution of man. Therefore, the last chapter focuses on Neolithization, the beginnings of food production in West Asia, Europe, Africa and the Americas, and the domestication of animals. This, again, is a brief but useful overview; it is a task for prehistoric archaeology to make inquiries into the complex processes subsumed under the umbrella term of Neolithization.

*Historia est magistra vitae* – History is life’s teacher. These well-known words of Latin wisdom imply that knowledge of the past *is* a prerequisite for understanding the present and prospering in the future. Beyond doubt, the exemplary monograph of Gyula Gyenis and Tamás Hajdu serves this form of learning.