

## Humans Increased Brain Size Allows for Greater Thought and Intelligence. Jerison, 1973

### BOOK REVIEWS

MILTON HILDEBRAND  
*University of California,*  
*Davis*

EVOLUTION OF THE BRAIN AND INTELLIGENCE. By Harry J. Jerison, xiv + 482 pp., figures, tables, bibliographies, index. Academic Press, New York and London. 1973. \$25.00 (cloth).

The significance of this book stems mainly from an approach which utilizes evidence based upon the extant brain endocasts from each of the classes of vertebrates. Thus the appropriateness of the dedication of this volume to Dr. Tilly Edinger (1897–1967), the illustrious pioneer *neuropaleontologist*.

The scope of the presentation is panoramic. In this context, the book should be of value to physical anthropologists and students of vertebrate evolution, because it does convey the "more general perspective of the history of the brain in vertebrates" in a geologic setting effectively. The chapters on the amphibia, reptiles, birds, Mesozoic mammals and Tertiary mammals can be read with profit.

The source material for Dr. Jerison's basic contributions is derived largely from quantitative data — from the so-called brain—body relation. From the size of the fossil brain endocast to body size of the animal and other quantitative data, many interesting concepts, interpretations and speculations are made. The following is one example. The "lower" vertebrates — fish, amphibia and reptiles — have probably always been at the same level of evolution with regards to the relation of brain size to body size. This relation is basically similar in all these classes of vertebrates through their entire phylogenetic history from the Ordovician period to the present. In contrast, the larger brain size to body size in the large brain vertebrates is a feature,

which appeared independently in two classes — birds and mammals — during the Mesozoic age. The enlarged brain to body size of the mammals during this age remained at a "Mesozoic level" for 100 million years. This was followed during the Cenozoic age by a further increase in the relative brain size to body size until the present level was attained. The latter took place during the past 50 million years or so. These and other similar observations and deductions add another dimension to an understanding of evolution. Although the precise accuracy of some data used (e.g., body weight of fossil species) can be challenged, the same would apply to other means of deriving quantitative data.

Many of the plausible conclusions and concepts in this book, although related to the evolution of the brain, are not actually derived from the data. This is due in part because the brain is essentially treated as a single unit — a statistic or a black box. The role of the brain during phylogeny resides primarily in the functional domain. This cannot be derived from the total weight or volume of the brain. Rather it flows from an understanding of how the component systems (e.g., optic, limbic and motor) are integrated into the economy of the brain, the nervous system and the organism. In this sense, the word intelligence in the title of the book could have, in the reviewer's opinion, better been omitted. This single unit approach in the book does deemphasize the significant roles of the

(1) species-specific organization and (2) functional components during phylogeny. Modern studies of comparative neurobiology of the living vertebrates are uncovering insights which relate to these roles. A chapter devoted to some of these recent advances would have enhanced the value of Mr. Jerison's presentation. An excellent bibliography is included. Physical anthropologists should familiarize themselves with the basic contents of this book.

CHARLES R. NOBACK  
Columbia University

**THE PERRINS LEDGE CREMATORY.** By Jane E. Buikstra and Lynne Goldstein. x + 40 pp., figures, tables, bibliography. Reports of Investigations No. 28, Illinois State Museum, Springfield. 1973. \$2.00 (paper).

This report is the eighth in the research paper series of the Illinois Valley Archaeological Program. The authors present both the archaeological and osteological data from the Perrins Ledge Crematory located in the Woods Creek Valley, Calhoun County, Illinois, an area about 45 miles north of St. Louis. The few grave goods which were found in association suggest that it is an early to middle Late Woodland (A.D. 600-850) Crematory. A minimum of 13 individuals are represented in the charred remains: 10 adults and 3 sub-adults.

Although there are two major parts to this publication: (1) a very detailed discussion of the research design developed for the excavation of a crematory and (2) the presentation and analysis of the cultural and osteological data recovered from this particular site, the publication is organized into four chapters and the result is a fair amount of redundancy. Chapter 1, written by Goldstein, is the archaeological analysis of the Crematory. The second chapter, authored by Buikstra, presents the model research design for both field observations of a crematory and the laboratory analysis of the charred osteological remains. The third chapter, also by Buikstra, is the analysis of the osteological material excavated, and Chapter 4 is a co-authored presentation of the interpretations and summary of the Perrins Ledge Crematory.

In excavating crematories the authors strongly advocate a close working relationship between the archaeologist and the physical anthropologist from the field to the laboratory. The Model Data Recovery Form presented in the appendix includes observation categories which are useful to both the archaeologist and physical anthropologist as they analyse the excavated material. No particularly unusual excavation technique is presented; it is recommended that every piece of bone and other material in the entire site be mapped and thus "the size of the excavation unit should be determined by the complexity of the field situation."

There is a very detailed discussion illustrating how an analysis of a crematory can yield information about (1) Mortality and Demography, (2) Cremation as a Mortuary Behavior, and (3) Biological and Social Relationships. A very useful part of the report is included in Chapter 2 where Buikstra brings together much of the literature on the characteristics of burned bone. The methods described for the determination of age and sex of cremated remains will also be of interest to the osteologist dealing with fragmentary bone found in multiple burials or ossuaries.

The area of the Crematory, which was defined by a series of limestone slabs, was about 20 feet square; there was a central area, about 8 feet square, which was the cremation basin. This central area was where the individuals were cremated; they were then swept aside before the next cremation. They suggest that at least two and maybe more separate cremations were held at this site. From the location of burned areas on the bone, it is suggested that complete bodies were burned. Due to the small sample it is difficult to say definitely that no special burial treatment was afforded these people, but the authors do feel that no age or sex category is unusually represented. Since no comparative material exists which would allow for biological distance studies, only raw data are presented here. These data consist of the nonmetric trait occurrences.

Very few cultural materials were found in association with the Crematory. Some chert flakes were found, but the more important artifacts are a leaf-shaped flake knife, the base of a pot, a pottery elbow