

INTERTWINING OF PALEONTOLOGY AND MEDICINE: IMPLICATIONS FOR STRUCTURE-FUNCTION RELATIONSHIPS, BEHAVIOR, AND HABITAT IN PALEONTOLOGY

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Medicine and paleontology have been intertwined from the start. Gideon Algernon Mantell, a family physician from Sussex, and his wife, while on patient care "rounds," found the first English dinosaur. Nineteen years later in 1841, Sir Richard Owen established the neologism, dinosaur, to categorize these animals. It is not accidental that the first Dean of Kansas University School of Medicine was also the founder of the University's Museum of Natural History. Rheumatology and paleontology paths have also crossed in the form of Thinocetus arthritus, so named because the ligamentous fusion in a specimen mistaken for arthritis.

Technology and understanding of disease processes have advanced sufficiently to allow hypotheses to be critically examined. The underlying assumptions are that:

1. Disease manifestations are relatively stable through time.
2. Tissue is preserved in a state amenable to analysis.
3. Pathology can be distinguished from diagenesis (pseudopathology).
4. Analysis of pathology as a skeletal phenomenon provides more insight than examination of isolated bones.
5. Analysis of pathology as a population phenomenon provides more insight than examination of isolated skeletons.

Exemplifying the intertwining nature of the fields is the presence of spine and sacroiliac involvement and the nature and distribution of erosive lesions in the great apes (Gorilla and Pan (chimpanzee), the lesser ape (Hylobates) and Old World monkeys (Theropithecus, Papio, Cercopithecus, Macaca, Presbytis, Colobus, and Erythrocebus). This allowed definitive diagnosis of spondyloarthropathy. Reproducibility of diseases across species lines has been established for spondyloarthropathy (gorilla, chimp, monkey), not only for gross or radiologic appearance of individual bones, but also for skeletal distribution. More recently, similar observations have been made for Smilodon and Mammuthus. Reactive arthritis, related to infectious agent diarrhea or sexually transmitted, is a consideration. Infectious agent diarrhea is common in Old World primates. This natural disease state provides a unique model system for in depth analysis of the contribution of genetic and environmental factors to disease pathophysiology.