Memorial to David M. S. Watson
1886-1973

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D.M.S. Watson with his assistant, J. Townend

David Meredith Seares Watson ranks as one of the outstanding vertebrate paleontologists of the 20th century. His studies have covered a wide range of vertebrates, touching upon all of the classes and concentrating on the lower tetrapods and their ancestry among the fishes. As new areas of study caught his interest, each became the base of a line of research which persisted through much of his career, so that his contributions form a series of parallel themes which carry through a period of about 50 years.

Professor Watson was the son of Dr. David and Mary (Seares) Watson. He was born in Manchester, England, on June 18, 1886. His early education was in a private school and then in the Manchester Grammar School until 1904. He began his university training at Manchester University as a student in chemistry, but his interest rapidly turned to paleontology when on vacation he chanced to discover a deposit of Carboniferous plant fossils. He began publication upon these materials early, while he was still a student at Manchester University. Papers on ferns, Lepidodendron, and coal balls continued to appear for several years and to dominate his earliest contributions.

In 1907 Watson received his B.Sc. with 1st Class Honors and in 1909, while he was a Demonstrator in Geology at Manchester, he was awarded his M.Sc. While searching for fossil plants during this period, he discovered a deposit of plesiosaur bones, and these turned his interest toward vertebrate paleontology which then became his main field of study. In 1909 he was appointed Lecturer at University College, London, and in 1921 he became the Jordell Professor of Zoology and Comparative Anatomy at that institution, a position which he held until his retirement in 1951. After retirement, he remained active until 1963, spending considerable time in the United States and broadening his work by studies of new materials in the museums in America.

While still concentrating on plant fossils during 1908 and 1909, Watson published his first works on vertebrates, one on a placoderm from the Old Red Sandstone, and another on Jurassic plesiosaurs. From then on, primitive fishes, amphibians, and reptiles occupied the center of the stage. Two world wars interrupted his work temporarily and took him into quite unrelated areas. In 1916, Watson became a lieutenant in

the Royal Naval Volunteer Reserve, and in 1918, a captain in the Royal Air Force, in research on airship and balloon fabrics! Again, in 1942 he was appointed Secretary in the Scientific Food Policy Subcommittee of the Food Policy Committee of the War Cabinet. Earlier, in 1933, he had become a member of the Agricultural Research Committee, and during the years 1939–1940, he was Secretary of the Council. His full bibliography includes such papers as "Beef Cattle in Peace and War" (1943) and "Science and Government" (1942).

Professor Watson's studies on vertebrate animals centered in three principal areas: (1) morphology and function, (2) systematics and phylogeny, and (3) mechanisms of evolution. Like that of most paleontologists, his work had an opportunistic aspect, concentrating upon what chanced to be at hand or what his field studies had unearthed. Thus it was directed largely by the kinds of vertebrate fossils which occur in the British Isles and by those of the areas which he visited during his trips abroad. The studies of fishes and amphibians were inspired largely by British materials, but his work on primitive and mammal-like reptiles largely stemmed from interests developed in South Africa and North America.

The collections of Carboniferous fishes and amphibians of the Hancock Museum in Newcastle kindled a persistent interest in the evolution of early amphibians and started Watson on a search for the ancestors of tetrapods. With E. S. Goodrich in England and W. K. Gregory in the United States, he firmly established that the ancestry of amphibians lay among the rhipidistian, crossopterygian fishes. Three major papers, in 1919, 1926, and 1929, were devoted to the morphology and phylogeny of Paleozoic and Mesozoic amphibians. These became classics upon which almost all later work on labyrinthodont and lepospondylous amphibians has been based. Two of his latest papers, in 1962 and 1963, were continuations of analyses of problems raised in this first series. In the meantime extending his interests to modern amphibians, Watson published a searching analysis of the problems of the origin of the anuran amphibians.

Functional analysis of vertebrates is a recurrent theme in Watson's work and indirectly tempered all of his studies. His early interest in plesiosaurs led him to an investigation of the mechanics of locomotion of these large, paddle-swimming "sea monsters." Far afield, he delved into the flight mechanics of the extinct flying reptiles, the pterodactyls. In each of these areas, his work set a trend which has been developed by others more versed in physics and engineering. These efforts, in which extinct vertebrates were seen as dynamic living creatures rather than merely bones to be described, were accompanied by inquiries into the nature of the evolutionary processes. Papers with titles such as "A Discussion of the Present Status of the Theory of Natural Selection" (1936), "The Mechanisms of Evolution" (1949), and "Is Macroevolution a Reality?" (1952) show his continuing interest in the theoretical aspect of paleontology.

One of the major events that shaped Watson's research was a trip to the richly fossiliferous Permian-Triassic formations of the Karroo Desert of South Africa. This venture from 1911 to 1912 stimulated a lasting interest in the therapsid reptiles and their relationships to mammals. Along with Robert L. Broom and Frederick von Huene, he traced the source of mammals to this group of "mammal-like" reptiles and sought their more remote origins in the primitive pelycosaurian reptiles, best known from the

United States. Papers on the cranial morphology of members of the therapsids, in particular the cynodonts and dicynodonts, and the evolution of therapsids appeared throughout the rest of his career. Like many students of this area, he was drawn to a study of the living egg-laying mammals, the monotremes, and he made important contributions to the understanding of the morphology of the puzzling pair of living forms, the duck-billed platypus and echidna.

Interest in the Karroo fossils and the search for their ancestors carried Watson on the first of his many trips to the United States in 1915. During this trip he visited the Permian redbeds of Texas, long famous for their fossil amphibians and reptiles, more primitive and earlier than those of the Karroo and broadly ancestral to them. This American trip began a continuing series of studies of the roots of the reptiles and, with E. C. Case, S. W. Williston, and F. von Huene, Watson brought order and understanding to the early phase of reptilian radiations, establishing a classification which was long accepted. Even today, it maintains a strong influence on all phylogenetic studies of these extinct animals. During the decade of the 1950s, during which Watson spent considerable time in the United States, work on the problems of early reptiles was renewed with classic studies on *Bolosaurus* and the classification of reptiles and studies of milleretids, primitive reptiles from Africa, seemingly transitional between cotylosaurs and lepidosaurians.

The Permian of Russia has held fascination for students of early reptiles since the earliest report of fossil remains from the Copper Sandstones in 1770. They have been obscured until recently by the curtain of the Russian language which few westerners managed to master. Reptiles and amphibians (intermediate between those of North America and South Africa) have come from the Permian-Triassic deposits of the Soviet Union. Watson, more than most paleontologists, had an interest in the potentials of these materials and the Russian publications on them. In 1931 he was appointed a foreign correspondent of the Academy of Sciences of the U.S.S.R. and in 1936 was made an Honorary Member of the State Soviet Paleontological Society. He visited the Soviet Union in 1945 and thereafter maintained close associations with the Russian paleontologists. He aided in bringing information on the Russian reptiles and amphibians to the attention of the rest of the world, efforts that finally reached maturity in very recent decades.

Beginning in 1934, Watson made several trips to the United States and received many honors from this country. In 1934 he was the James Arthur Lecturer of the American Museum of Natural History and in 1939 became an Honorary Member of the National Academy of Sciences. In 1941 he received the Mary Clark Thompson Medal of the Academy. In 1946 he became a Foreign Member of the Society of Vertebrate Paleontology and in 1955 an Honorary Member of this organization. He became a correspondent of the Geological Society of America in 1950 and an Honorary Member of the Academy of Arts and Sciences in 1953. Similar honors came to him from other countries, including France, Germany, South Africa, India, Sweden, Australia, and, of course, England.

After his retirement from University College, London, in 1951, Watson accepted an appointment as Alexander Agassiz Professor at Harvard University, Cambridge, Massachusetts. There, working with Professor A. S. Romer, he entered one of the most

productive periods of his career. He traveled widely in the United States during this time and was received with a mixture of awe and affection at universities and museums across the land. His work during this period and through the rest of the decade ranged widely over the area of fossil vertebrates, from the nature of the most primitive fishes through work on classification of the therapsids, and even to "Africa and the Origin of Man" in 1949. His approaches to studies of American materials from a fresh point of view have influenced the later work of American paleontologists and are reflected in all of the studies that came from his hand during his late years.

Professor Watson brought prodigious energy, a great breadth of knowledge, and a phenomenal memory to the field of vertebrate paleontology. He enriched it by some 140 publications, including books, monographs, and scientific reports. He worked within a solid framework of evolutionary theory (largely within a classical framework) mostly before the advent of efforts to apply population genetics and ecological concepts to the study of vertebrate evolution. The evolutionary questions he asked and the theoretical basis of his inquiries into the field of evolution have, of course, become somewhat outmoded. Like the data and systematic analyses which he presented, however, they have served to establish a stable base within which the present day investigations find their roots.

Professor Watson retired in 1963 from active research when he felt that the great memory upon which he had so long depended was beginning to fail. His work up to that time on fishes, amphibians, reptiles, the origin of mammals, and primitive mammals stands today as a monument to a great career spanning half a century. The annals of vertebrate paleontology have been immeasurably enriched by the work of this great scientist.

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