

Alexander Wetmore and the Study of Fossil Birds

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In most general discussions of paleontology or ornithology, the subject of fossil birds is almost invariably treated with a predictable uniformity. Mention is made of *Archaeopteryx* and the Cretaceous toothed birds, and occasionally some of the large Tertiary predators like *Diatryma* and *Phorusrhacos*. This is accompanied by a statement explaining that bird bones are fragile and seldom preserved, thus accounting for what is alleged to be a meager and uninformative fossil record for the entire class. Through frequent repetition, this myth has gained such general acceptance that the uninformed find it difficult to conceive of an avian paleontologist being able to find enough to keep himself occupied.

Yet for 60 years Alexander Wetmore has produced a steady stream of papers on fossil birds. With over 150 such entries and nearly as many new fossil taxa to his credit, he can without reservation be said to have contributed more to this field than any other single person. One cannot help but be humbled to think that this is but a fraction of his total scientific output.

Bringing together this collection of papers in avian paleontology to honor Alexander Wetmore's 90th birthday on 18 June 1976 provides not only an opportunity to review his influence on paleornithology over the past six decades, but also offers a chance to begin dispelling the fiction that fossil birds are rare and provide little information on avian evolution.

Wetmore's most intensive work on fossil birds took place in the period after the waning of excitement over the spectacular 19th century discoveries of Mesozoic birds, but before most of the renewed modern interest in avian paleontology had been sparked. For many years Wetmore was virtually the only person anywhere who was engaged in research on fossil birds, with the notable exception of the California school of Loye and Alden Miller and Hildegard Howard. Thus it was natural that bird fossils from all parts of the United States and from areas of the world as diverse as Inner Mongolia, Java, St. Helena, Hawaii, and Bermuda, passed through Wetmore's hands continually. To this day, the cabinets in his office hold a rich trove of undescribed treasures from a wide array of horizons and localities.

For many years, Wetmore has assiduously maintained an extensive card catalog of references from which he prepared three separate editions of a checklist of fossil birds of North America. He also endeavored to keep his colleagues abreast of current developments in avian paleontology through numerous addresses, lectures, and entertaining synoptic papers—all the while maintaining a consistently high level of production of basic detailed descriptions and diagnoses of new forms.

Wetmore's first paper on fossil birds involved removing the large Miocene bird described by R. W. Shufeldt as *Palaeochenoides miocaenus* from the Anseriformes to the Pelecaniformes. Shufeldt, whom Wetmore knew well, was in no way

pleased by this, but Wetmore's action was quite correct. Specimens possibly representing two new species of *Palaeochenoides* have recently come to the National Museum and it now appears that these may provide a breakthrough in our understanding of these huge, enigmatic seabirds. Wetmore's recognition of the true affinities of *Palaeochenoides* marked the first step toward this understanding. Shufeldt, it might be noted, was a singular eccentric who, although making many contributions to avian paleontology, repeatedly made serious errors in identification. The process of re-evaluating Shufeldt's taxa, begun by Wetmore and others, has continued up to the present, as seen, for example, in the papers on Eocene Piciformes elsewhere in this volume.

The first new bird Wetmore described from osteological remains was a new genus and species of large flightless rail, *Nesotrochis debooyi*, found in Indian middens in the Virgin Islands. That such deposits may still be of interest to avian paleontologists is clearly demonstrated by Morejohn in the final paper of the present volume. In recent years two new species of *Nesotrochis* have been described from Cuba and Hispaniola; despite this, the genus remains so distinctive that there is not yet a good clue as to its affinities within the Rallidae.

Wetmore continued to draw notice to the extinct Pleistocene birds of the West Indies, analyzing fossil avifaunas from Puerto Rico, Haiti, Cuba, and the Bahamas. Among the most notable of his discoveries was the giant barn owl, *Tyto ostologa*, of Haiti, which he correctly diagnosed from a small fragment of tarsometatarsus. He later described a similar species, *T. pollens*, along with two new large eagles, from the Bahamas. As late as 1959, Brodkorb, in dedicating to him a new fossil species of crow from New Providence Island, remarked that Alexander Wetmore was "responsible for all previous knowledge of fossil birds of the West Indies." Since then, there have been many additional discoveries of avian fossils in the Antilles, the most remarkable of which are certainly the gigantic raptors of Cuba brought to light through the labors of Oscar Arredondo (summarized in this volume). Among the material from the same deposits that yielded *Tyto ostologa*, a new rail and a new falcon have recently been found. There is every reason to believe that the fossil resources of the Greater Antilles will continue to produce surprises, while as far as avian paleontology is concerned, the Lesser Antilles are *terra incognita*.

Perhaps the greatest proportion of Wetmore's paleontological efforts concerned the identification and description of Tertiary birds from North America, especially those of the Eocene, Oligocene, and Miocene terrestrial deposits of the western states and the marine Miocene of the east coast. In these areas he has laid the groundwork for all future researches.

Some of the most exciting recent finds of fossil birds are from the extensive lower Eocene deposits of the Green River Formation, for these often yield complete, articulated skeletons, as for example a particularly fine specimen of primitive frigatebird now under study by the writer. Feduccia and Martin in this volume discuss the significance of the Green River Piciformes, which are now coming to light with remarkable rapidity since Brodkorb's recognition of the first species in 1970. But perhaps the most astonishing of developments in Green River paleornithology are the tremendous deposits of flamingo bones discovered by Paul O. McGrew and now under study by him and Alan Feduccia. Here too, Wetmore's past contributions have played a part, for he described this flamingo in 1926 as a new genus of recurvirostrid, *Presbyornis*. This case of mistaken identity is understandable in view of Feduccia's further investigations, which

have disclosed some extraordinary similarities between the skeletons of recurvirostrids and flamingos, particularly those of the lower Eocene forms. This is further confirmed by an undescribed flamingo of Bridgerian age in the National Museum which is even more similar to recurvirostrids than is *Presbyornis*. These discoveries now appear to be leading to a reappraisal of the affinities of both the flamingos and the shorebirds.

Wetmore's several contributions on Eocene owls resulted in his erecting a new family, the Protostrigidae, the importance of which is only now becoming apparent. The fossil record of owls is particularly good and we now know that the order extends back at least as far as the Paleocene (see Rich and Bohaska's paper in this volume). Much unstudied material of fossil owls is to be found in various museums, which, along with the revision of the many forms already known, should provide an especially fruitful area of inquiry for avian paleontologists in the future. Of Wetmore's Eocene birds, perhaps the most provocative is *Neocathartes gallator*, a long-legged vulture that was based on a nearly complete skeleton.

Wetmore's contributions once provided just about all that was known of the birds from the extensive Oligocene deposits of western North America. These are now producing new and extremely interesting fossil birds almost annually (e.g., Olson's paper in this volume). One of the predominant groups of birds in the North American Oligocene was the gruiform family that Wetmore named the Bathornithidae. Wetmore himself offered more than one interpretation of the possible relationships of this group and Cracraft has recently proposed others. It seems certain that the final word has not been said on this matter, but the importance of the Bathornithidae is undisputed. Once again, it was Wetmore's pioneering work on the group that has made possible all subsequent investigations. It now appears that the Oligocene limpkins (Aramidae) described by Wetmore will soon be augmented by a new genus, known from much of a skeleton collected in Wyoming by Dr. R. J. Emry of the National Museum. Oligocene raptors described by Wetmore include two forms inseparable from the modern genus *Buteo*, and an intriguing species, *Palaeoplancus sternbergi*, which was made the type of a new subfamily of Accipitridae.

For Wetmore, some of the most interesting fossil deposits were those closest to home—the Miocene marine beds of the Chesapeake Group. Most of what we know of the birds of these deposits is to be found in Wetmore's publications, including the description of a diminutive gannet, *Microsula avita*, which is now known to be relatively common in these beds. In the past few years many new specimens, some of them highly significant, have come to the National Museum from this area, although these are as yet undescribed. As abundant as this material is, it is far overshadowed by the tremendous collections of Miocene and Pliocene age that have recently been acquired from a phosphate mine in North Carolina and which this writer has had the privilege of studying in collaboration with Dr. Wetmore. This is probably the largest deposit of Tertiary birds in existence and thousands of fossils of more than 50 species have so far been recovered. These collections, along with those from Bone Valley, Florida, being studied by Brodkorb, and those from the Pacific coast, which are constantly productive (see the contributions by Howard and Warter in this volume), provide a solid basis for making unprecedented gains in our knowledge of evolution in the Alcidae, Procellariidae, Diomedidae, Gaviidae, Sulidae, Phalacrocoracidae, and other families of marine birds.



Dr. Wetmore on a Smithsonian collecting trip to the Lee Creek phosphate mine, Aurora, North Carolina, 26 April 1972.

In 1931, Wetmore published a large paper on the Pleistocene avifauna of Florida in which it was shown that several birds, such as the California condor and the huge vulture *Teratornis*, then known only from the west, particularly from the tarpits at Rancho la Brea, were also present in Florida. This opened up a very fertile area of investigation and in succeeding years the studies of Brodkorb and others have continued to be a source of new information on the rich Pleistocene avifauna of Florida (e.g., Storer's paper herein). In his many years of involvement in paleornithology, Wetmore has repeatedly been called upon to identify material from Pleistocene caves and from Indian middens, a task which as often as not holds few rewards but which nevertheless he pursued with alacrity. From such studies he published numerous notes showing that the distribution of many modern North American species was once much different than at present, as indicated, for example, by Canada Jays, Magpies, and Sharp-tailed Grouse in Virginia, and Spruce Grouse in Virginia and Georgia. The sum of these observations has proved to be a significant contribution to our knowledge of the effects of Pleistocene climatic changes on avian distribution.

When the Central Asiatic Expeditions of the American Museum of Natural History discovered fossil birds in the Eocene of Inner Mongolia, it was to Wetmore that the specimens were sent for study. The most abundant material was that of the crane-like bird which Wetmore named *Eogrus aeola*, assigning it to

a new family, Eogruidae. Recently, the significance of these birds as the probable ancestors of the peculiar two-toed running birds of the family Ergilornithidae has been demonstrated (see Kurochkin's paper herein) and provides one of the most interesting examples of an evolutionary lineage in the avian fossil record.

Oceanic islands are of particular interest to the avian paleontologist because of the rapid extinction of species after the introduction of exotic predators by man. Most such introductions occurred before the era of scientific exploration and thus many insular species can be known only from the study of fossil or subfossil remains. Here Wetmore has likewise made numerous contributions. In 1943 he described an extinct goose from the island of Hawaii. This turned out to be but a small indication of what was to come, for in the past few years the Bishop Museum has forwarded to him for examination numerous fossils from Molokai and Maui, which comprise one of the most extraordinary avifaunas ever uncovered, some of the species being so anomalous as to be quite beyond the wildest imaginations of the most whimsical fantasizer. From Pleistocene deposits on Bermuda, Wetmore described a crane and a duck, leaving to Brodkorb the naming of five new rails from these and other deposits on the island (as yet undescribed). From St. Helena, in the South Atlantic Ocean, Wetmore named a new rail to provide a first step in the elucidation of the extensive fossil avifauna of that island, which this writer has recently had the opportunity to expand.

We have touched on but a few of Alexander Wetmore's contributions to avian paleontology and their importance to present and future research. It should by now be clear that, contrary to persistent belief, fossil birds are not uncommon, and in the following pages it should be equally evident that there is much to be gained from their study.

At last there is some light being shed on the study of Cretaceous land birds (see Brodkorb's paper herein), an area that had hitherto been a void. The renowned Pleistocene tarpits at Rancho la Brea, California, long erroneously held to be the only really productive source of avian fossils, now find a rival in similar deposits in South America which portend a new era of discovery on that continent (see Campbell's paper in the present volume). Although these many new finds are of paramount importance, the avian paleontologist has also inherited a rich source of information in the fossils that have been made known previously. Re-examination of the much discussed but widely misunderstood Mesozoic birds, such as the Jurassic *Archaeopteryx* and the Cretaceous toothed divers, has generated exciting new ideas and controversy, all of which can only lead to a better understanding of avian evolution (see the papers by Ostrom, Gingerich, and Martin and Tate in this volume). Long-neglected fossil birds, such as those from the vast Tertiary collections of France and from the wealth of material in the New Zealand Quaternary, are coming under scrutiny once again, and in the light of modern concepts find a better place in the evolutionary scheme (see papers herein by Collins and Cracraft). It would seem, therefore, that avian paleontology is truly experiencing a renaissance.

In 1932, Joseph Grinnell (*Auk*, 49:9-13) in pondering the latest edition of the American Ornithologists' Union's *Checklist of North American Birds*, to which Wetmore contributed the portion on fossils, attempted to make some inferences about future lists and the number of species they might contain. Concerning the fossil list he queried, "And what about the number and relative acumen of future students in avian paleontology: Will they be more numerous and more

alert than heretofore or will the attractions in this field wane in the face of the ascending allurements for bright minds of bio-physics, bio-chemistry and cosmic mathematics? These questions are more or less baffling of answer." Forty-five years later, the answers are apparent. We offer the present volume as testimony to the fact that avian paleontology has quite enough allure of its own to attract numerous and perspicacious practitioners, and that the materials they study allow of significant advances not only in the knowledge of birds, but of biology and paleontology as a whole. The discipline that Alexander Wetmore nurtured for sixty years is expanding and vigorous and reaping the benefits of his devotion.



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