

Obviously the jaw movements of *Pelecanus* have reached a high degree of refinement and versatility, and further investigation may contribute substantially to our understanding of jaw mechanics in birds as a whole. The amenability of pelicans to captive conditions may prove useful in pursuing such studies.

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A 36-year laying record of a Wattled Crane at the New York Zoological Park.—Few data are available on the reproductive history of individual cranes over long periods. The laying history of a female Wattled Crane (*Buggeranus carunculatus*) acquired as an adult by the New York Zoological Society on 6 May 1940 and still living at the Bronx Zoo offers useful insights into this species' reproductive potential.

During 14 of the past 36 years, this bird (NYZP-I.D. #400210) was unmated and reproductively quiescent. A mate was available from 1940 to early 1949, and zoological garden records show that she produced chicks each year from 1944 through 1947. After the male died on 12 March 1949, no other mate was acquired until 3 April 1963, when the St. Louis Zoological Park provided a bird it had acquired as an adult on 28 September 1951.

Although the female had not laid in many years, perhaps not since her original mate had died but certainly not since 1957, she promptly bred with the new male and produced a clutch of two fertile eggs in November 1963. Since then, a record has been maintained of each egg deposited. Although fertility has been extremely low (only seven of the eggs discussed below are known to have been fertile) the laying record is of interest in itself.

From 4 November 1963 through 30 July 1976, #400210 deposited 58 eggs in 41 clutches; 17 clutches were of 2 eggs and 24 of 1 egg. The bird's reproductive year apparently begins in October and ends in June. No eggs have been deposited in July, August, or September. Peak laying periods during the 13 years from 1963 through 1975 were April (11 eggs), March (10), February (9), January (8), and November (8). The breeding pair has been maintained with a New York City photoperiod, largely outside but often indoors with some heat under a skylight in winter.

In eight 2-egg clutches, the second egg was laid on the 4th day following the first; in 6 clutches, the laying interval was 3 days. The shortest period between 1-egg clutches was 15 days and the shortest period between 2-egg clutches was 14 days. The most productive year (1969) produced 8 eggs: one on 5 February, a 2-egg clutch beginning 21 days later, a 2-egg clutch beginning on 17 March 15 days after the second egg of the second clutch, a 2-egg clutch on 3 April started 14 days after the completion of the third clutch, and a final 1-egg clutch on 20 April only 13 days after completion of the fourth. From 1974 through 1975 only 1-egg clutches were deposited and only 2 eggs have been laid in each of the last 2 years. She has laid no eggs thus far in 1976.

Egg weights were recorded for 23 eggs, all but 2 of them infertile. The 2 fertile eggs, produced in 1963, weighed 204.4 g and 199.7 g at 9 days and at 13 days prior to hatching respectively. The 21 infertile eggs for which weights were obtained near the start of incubation varied from 199.0 to 258.0 g with a distribution as follows: 199–210 g (2 eggs), 211–220 g (1), 221–230 g (2), 231–240 g (6), 241–250 g (4), 251–258 g (6).

Seven incubation periods have been recorded since 1963; 3 of 35 days, 2 of 36 days, 1 of 37 days, and 1 of 32 days.

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An immature specimen of *Baptornis advenus* from the Cretaceous of Kansas.—In 1962 Bonner discovered a partial skeleton of the Cretaceous diving bird, *Baptornis advenus*, Kansas University Vertebrate Paleontology (KUPV) 16112, from the Smoky Hill (upper) member of the Niobrara Chalk. The specimen was in KUPV Logan County collecting locality 20, in the SE ¼, NW ¼, sec. 13, T 15 S, R 34 W, Logan County, Kansas. This is the same locality and horizon as the quarry that produced many slabs of the floating crinoid, *Uintacrinus socialis* (Miller et al. 1957). The skeleton of *Baptornis* was fragmentary and from a young individual. Parts of the premaxilla, cervical, thoracic, and sacral vertebrae, pelvis, both femora, both tibiotarsi, both tarsometatarsi and some phalanges were recovered. Immature specimens of Mesozoic birds occur infrequently, although the proximal end of a tarsometatarsus associated with the type of *B. advenus* is also from a very young individual.

The adult skeleton of *Baptornis* has recently been described in detail by Martin and Tate (1976). In the present specimen, the fragment of premaxilla (Fig. 1, I) comes from a point just anterior to the external nares and indicates a bill similar to that of *Hesperornis*. If teeth were present, they were restricted to the maxillary as in *Hesperornis*. The cervical vertebrae include specimens that seem to correspond to the 8th, 13th, and 14th cervicals of *Hesperornis*, but appear to be shorter and more massive than in that genus. The ventral border of the centrum corresponding to the 8th cervical is flat and hourglass shaped. The vertebrae corresponding to the 13th and 14th cervicals have very short centra and long sublateral processes, which do not unite ventrally. Five vertebrae bearing rib facets are present. Two of these have narrow articulations of the centra and narrow hypapophyses. Another vertebra corresponds to the 22nd vertebra in *Hesperornis* and has small hypapophyses. The two following vertebrae are also preserved. That corresponding to the 24th in *Hesperornis* does not bear a rib. It has a short transverse process with a broad triangular area on its lateral margin for articulation with the ilium. A portion of the sacrum with three fused vertebrae is also present. Several of the dorsal vertebrae have small, shallow pits on the articular surface of the centrum although all are fully heterocoelous.

The right femur (Fig. 1, A) is represented by fragments of both the proximal and distal ends, while the left femur is represented by a portion of the proximal end including the head. The femur seems to have achieved most of the adult proportions (Fig. 1, B). The tibiotarsi are represented by the distal end and part of the shaft of the right (Fig. 1, C) and the distal end of the left. The tarsals were not fused either to the tibia or to the metatarsals and therefore were not recovered. The shaft of the tibiotarsus is very slender, flat and only about 72% as wide as that of an adult. This specimen was mistakenly identified as the proximal end of a large humerus by Walker (1967, p. 65). The three metatarsals are not fused in the proximal end of KUPV 16112, although the distal end was completely ossified. The metatarsals increase in size from the second to the fourth. The tarsometatarsus (Fig. 1, F) is at least 10% smaller than that of an adult (Fig. 1, G). Proximal ends of two phalanges and the distal end of another are present.

Descriptions of immature fossil birds are rare, although Howard (1945) published a very useful paper on the growth stages of the tarsometatarsi of the fossil turkey *Parapavo californicus*, from Rancho La Brea. She recognized nine stages of development from newly hatched chicks to fully grown birds. The present specimens of *Baptornis* would seem to fall into her "group IV" which she characterized as having the "distal end nearly completely formed except external foramen not entirely closed off. Proximal end still spongy" (Howard 1945: 598). The proximal end (Fig. 1, H) associated with the holotype of *Baptornis advenus* by Marsh (1880) would probably belong in Howard's "group V" where the proximal end is less porous and is flattened. It has a single small unfused tarsal which is roughly triangular in shape and is situated between metatarsals II and IV.

A partial skeleton in the collections of the Field Museum of Natural History (FMNH 395) has the tibiotarsi with some of the sutures for the tarsals (Fig. 1, D) still visible. One large tarsal element covers the distal end. The astragalus has not fused and has a long dorsal process. It is completely fused in the adult (Fig. 1, E) but the fusion appears to occur much later in the ontogeny of *Baptornis* than in modern birds.