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Osteological disorders in late Pleistocene birds from the Schusterlucke, Lower Austria

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(With 2 plates)

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Summary

Three pathologically transformed avian bones from the late Pleistocene of Schusterlucke, Lower Austria, are described.

Zusammenfassung

Drei pathologisch veränderte Vogelknochen aus dem Jung-Pleistozän der Schusterlucke, Niederösterreich, werden beschrieben.

Introduction

Healed fractures and other skeletal disorders are not uncommon in fossil birds (Lambrecht 1933, Tasnadi-Kubacska 1962). Unfortunately they are rarely studied, even though they can reveal important data on the life habits of those birds (Parmalee 1977, Goodman & Glynn 1988). In the present paper we describe three pathological bones of birds found in Schusterlucke, Lower Austria.

The Schusterlucke site is dated at approximately 115 000 yr BP (G. Rabeder, pers. communication). The bones were thus deposited during the first Würmian glacial (Würm I) or at the beginning of the Q4 biozone sensu Horáček & Ložek (1988). The avian taphocenosis of Schusterlucke was first described by Woldřich (1893) and is presently under revision by the senior author (Mlíkovský, in prep.).

Anatomical nomenclature follows Baumel et al. (1979) throughout the present paper. The studied material is deposited in the Geologisch-Paläontologische Abteilung of the Naturhistorisches Museum Wien (NHM).

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Results

Tarsometatarsus, NHM 1888/XVIII/456
(Pl. 1, Figs. 2 and 4)

The figures depict a left tarsometatarsus of a Hazelhen *Tetrastes bonasia* (LINNAEUS). A smaller exostosis occurs on the lateral border of the trochlea metatarsi IV. It probably developed following a traumatic injury of the periost. The damage probably had little effect on the locomotor abilities of the bird.

Tarsometatarsus, NHM 1888/XVIII/470
(Pl. 1, Figs. 5 and 7)

The figures depict a left tarsometatarsus of a Willow Ptarmigan *Lagopus lagopus* (LINNAEUS). An extensive periostal exostosis occurs in the area of the trochlea metatarsi III and trochlea metatarsi IV. The exostosis is divided by a deep proximodistal groove. Compared with normal bones, the distal end of the pathological tarsometatarsus is more robust and has a closed canalis interosseus tendineus. The groove in the exostosis indicates that a tendon passed through it, most probably that of musculus digitorum longus.

The disorder was probably a consequence of an injury of the metatarsophalangeal joint or its chronic disturbance which resulted in extensive periostitis ossificans. The leg was probably fully functional, although the bird could have had a slight hobble.

Tarsometatarsus, NHM 1888/XVIII/508
(Pl. 2)

This is the left tarsometatarsus of a Tufted (?) Duck *Aythya* cf. *fuligula* (LINNAEUS). Its proximal part is markedly shortened, deformed by massive exostoses and a porously ossified hypertrophic osseous callus. The deformed proximal part is laterally deflected from the physiological axis of the bone by approximately 20°. The proximal parts of the metatarsals II–IV are unfused. Distal tarsal elements are lacking, indicating that they have not yet ankylosed with metatarsals II–IV (cf. HOGG 1982). The distal part of the tarsometatartsus is normally ossified.

The phenomenon was probably caused by an ontogenetically early (though postnatal, or at least perinatal) fracture of the developing tarsus and its imperfect healing; the result was that the distal part of tarsus continued to ossify normally, while its proximal part ceased this process and retained its juvenile form. A more accurate explanation of the phenomenon is currently impossible, particularly because „our understanding of even the first principles of limb morphogenesis remains disturbingly inadequate" (HINCHLIFFE & GUMPEL-PINOT 1983: 321). The timing of tarsal ossification is unknown for *Aythya,* but domestic chicken of comparable body size and similar mode of ontogeny (see RICKLEFS 1983) finish ossification of their tarsometatarsi between 65–160 days post-hatching (LATIMER 1927, SCHINZ & ZANGERL 1937, HOGG 1982). We may thus assume that the duck

died at a minimum age of 10 weeks, i. e. at a time when Tufted Ducks are fully flying and independent from parents (MLÍKOVSKÝ & BUŘIČ 1983).

Discussion

The bones with osteological abnormalities described above were found among approximately 4020 healthy avian long bones from Schusterlucke. The incidence is thus approximately 0.075%. This value is roughly in accordance with previously reported rates of osteological abnormities in modern wild birds (0.35% of 13000 bones; BRANDWOOD et al. 1986) and in subfossil birds from Arikara sites in South Dakota (0.16% of 3100 bones; PARMALEE 1977).

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Plate 1

Pathological (Figs. 2, 4, 5 & 7) and normal (Figs. 1, 3, 6 & 8) tarsometatarsi of *Tetrastes bonasia* (Figs. 1–4), NHM 1888/XVIII/456, and *Lagopus lagopus* (Figs. 5–8), NHM 1888/XVIII/470, from the late Pleistocene of Schusterlucke, Lower Austria.

1, 2, 5, 6 – dorsal view, 3, 4, 7, 8 – plantar view.


1
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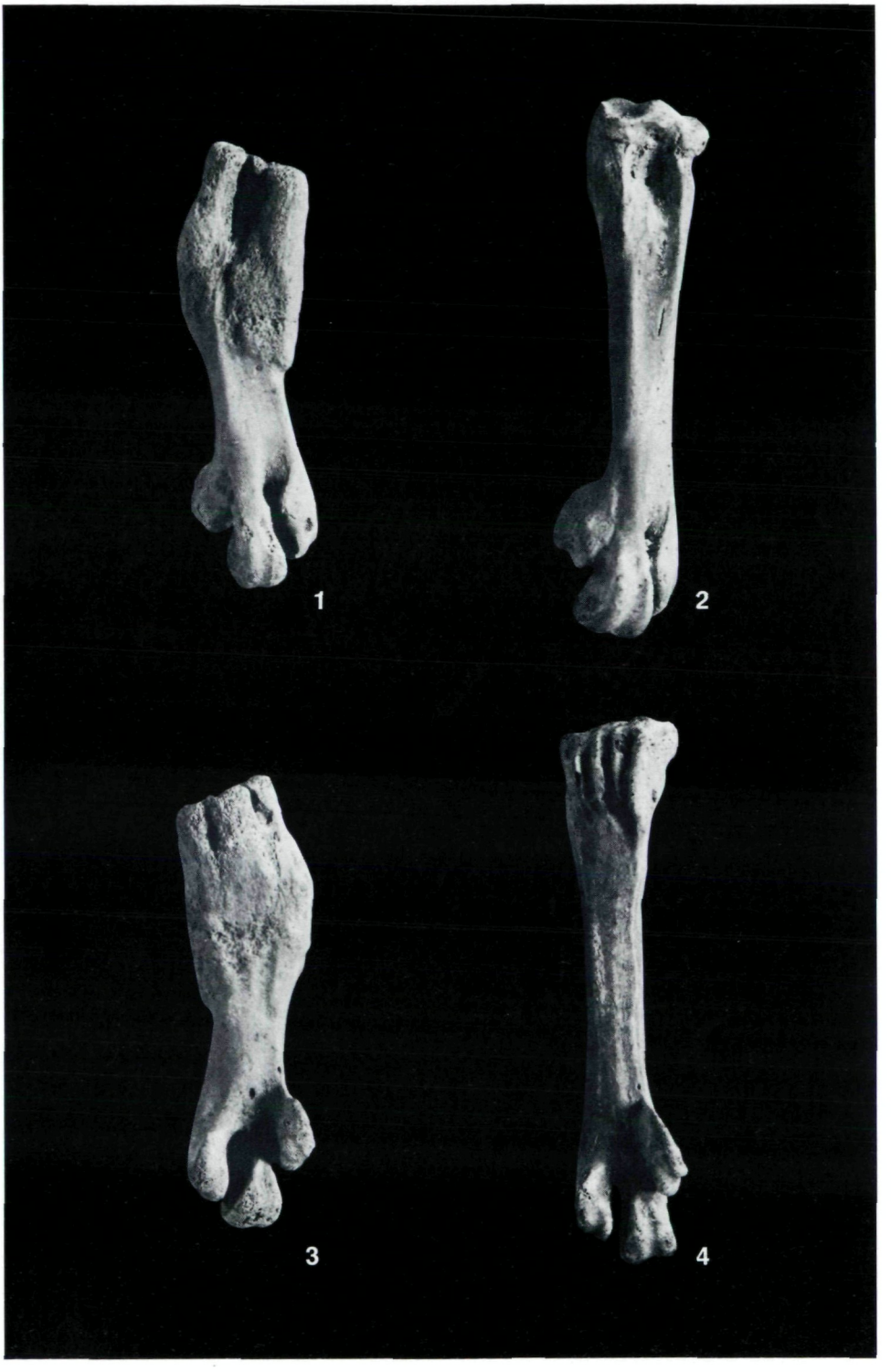
4
5
6
7
8

Plate 2

Pathological (Figs. 1 & 3), NHM 1888/XVIII/508, and normal (Figs. 2 & 4) NHM 1988/XVIII/508, tarsometatarsi of *Aythya* cf. *fuligula* from the late Pleistocene of Schusterlucke, Lower Austria.

1, 2 – dorsal view, 3, 4 – plantar view.

Photographs: Milan NOVOTNÝ (Brno).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