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## INTESTINAL PARASITES IN MAN OF OLD BRONZE AGE

**Abstract** — In a refuse pit discovered at the locality "Nivky" at the land-register territory of the community of Hulín (district Kroměříž, central Moravia) skeletons of 3 persons were found (Fig. 1: 1–4): two skeletons of children (No I and III) and one of an adult man. The find falls into the period of the final stage of the Old Bronze Age, 1,600–1,500 years before our era (B.C.). Samples of earth taken from the pelvic regions of skeletons II and III were examined for the presence of eggs of parasites. In the samples taken from skeleton II no eggs were found. In samples from skeleton III eggs of three species of parasitic Nematoda were found: *Trichuris trichiura* (Linné, 1771), *Ascaris lumbricoides* (Linné, 1758) and *Ancylostoma duodenale* (Dubini, 1843). The eggs are well preserved. (Fig. 2: 1–2).

**Key words:** Moravia — Hulín (distr. Kroměříž) — Old Bronze Age-settlement of the Věteřov group — refuse pit with three skeletons — intestinal parasites.

In 1988 a group from the Archaeological Institute of the Czechoslovak Academy of Sciences, headed by Lubomír Šebela, started a rescue archaeological research at the locality "Nivky" in the land-register territory of the community of Hulín, district Kroměříž. In the course of that season 19 settlement objects dating back to the Old Bronze Age and a grave with skeletal remains from the Late Stone Age (the Corded Ware Culture) were discovered. For parasitological research samples were taken from object No 1 in probe IV.

**Find situation:** The above settlement object appeared on a loess basal layer at the depth of 90 cm below the level of the present-day terrain. It is of circular shape (diameter = 180 cm). Its walls were irregularly conically narrowed to the depth of 40 cm, and towards the bottom they widened again. A dish-like bottom was found at the depth of 110 cm below the level of the basal layer (diameter of the bottom — 170 cm). In the western part of the pit, at the height of 20 cm above the bottom a child's skeleton (age — 6 years) was found, lying on the right side with the head to the west (Fig. 1.2). Two other skeletons were discovered at the bottom of the pit in its eastern sector (Fig. 1: 3, 4). One skeleton belongs to an adult individual (II) buried in a crouched position on the left side with the head towards northwest. According to preliminary results of anthropological investigation carried out by RNDr. M. Dočkalová (Anthropos Institute, Moravian Museum, Brno) it belongs to a man, 25–30 years old. The other person (III) was evidently strongly bound and it was again a child (age — 3 years). Near the skeletons there was a stone plate, osteological material, daub, silex and mainly pottery sherds.

**Dating:** On the basis of the preserved inventory, particularly pottery, the pit with skeletons as well as the other objects of the settlement, can be ranked culturally to the Věteřov group representing the final stage of the Old Bronze Age; expressed in absolute chronology, the period of about 1,600 to 1,500 years before our era.

### Parasitological analysis

**Methods and material:** For parasitological analysis samples of earth were taken from the pelvic region of the adult individual (skeleton II) and of the second child (skeleton III) — see Fig. 1: 3–4. The samples were examined for the presence of eggs of human intestinal parasites. The Faust flotation method was used, which is currently used in the parasitological examination of the stool samples. About 2 cm<sup>2</sup> of the earth

was thoroughly mixed with a small amount of distilled water in a centrifugal test tube. Then the water was filled up to reach about to 0.5 cm below the brim of the test tube, the content was again stirred and centrifuged 3 min. at 2,500 r. p. m. After a careful removal of the supernatant the sediment was thoroughly stirred in the aqueous solution of zinc sulphate (ZnSO<sub>4</sub>) of density 1.18. After completion of the solution of sulphate 0.5 cm below the brim of the test tube the material was again centrifuged for 3 min. at 2,500 r.p.m. Then the test tubes were transferred to a stand, the solution of sulphate was filled up to the brim of the test tube and a microscopic cover glass (18 by 18 mm) was put on the surface. After 20 min. this glass was transferred together with the layer of the solution to the support glass. The preparation thus prepared was inspected in a light microscope. Altogether 50 preparations from the sample of skeleton II and 40 preparations of skeleton III were inspected.

### Finds of parasites

In samples from the pelvic region of the adult man (II) no eggs of parasites were found. In the content of the pelvis of the child's skeleton (III) eggs of three species of intestinal parasites were found: of *Trichuris trichiura*, *Ascaris lumbricoides* and *Ancylostoma duodenale*. The eggs are well preserved, mostly without traces of damage (Fig. 2: 1–2). The three species belong to the class of Nematoda. *Trichuris trichiura* (Linné, 1771) measures about 4–5 cm when adult. The eggs are oval, brown coloured, with characteristically arranged poles. In the material studied they measured 0.0555 by 0.024 mm. *Ascaris lumbricoides* (Linné, 1758,) is essentially larger, females reaching the length of as much as 40 cm, males 12–25 cm. The eggs are almost globular, whitish, with rough surface. In our material they measured 0.063 to 0.064 mm by 0.045–0.049 mm.

The *Trichuris trichiura* and *Ascaris lumbricoides* found belong at present among generally current human intestinal parasites. According to the degree of infestation they can evoke different intestinal difficulties to serious disease. They are distributed practically all over the world (cosmopolitan distribution). In our population the two species occur at present in one to several per mille of persons. They belong to the so-called geohelminths, i.e. they do not need intermediate host organisms for their development, the infestation taking place by swallowing ripe eggs.



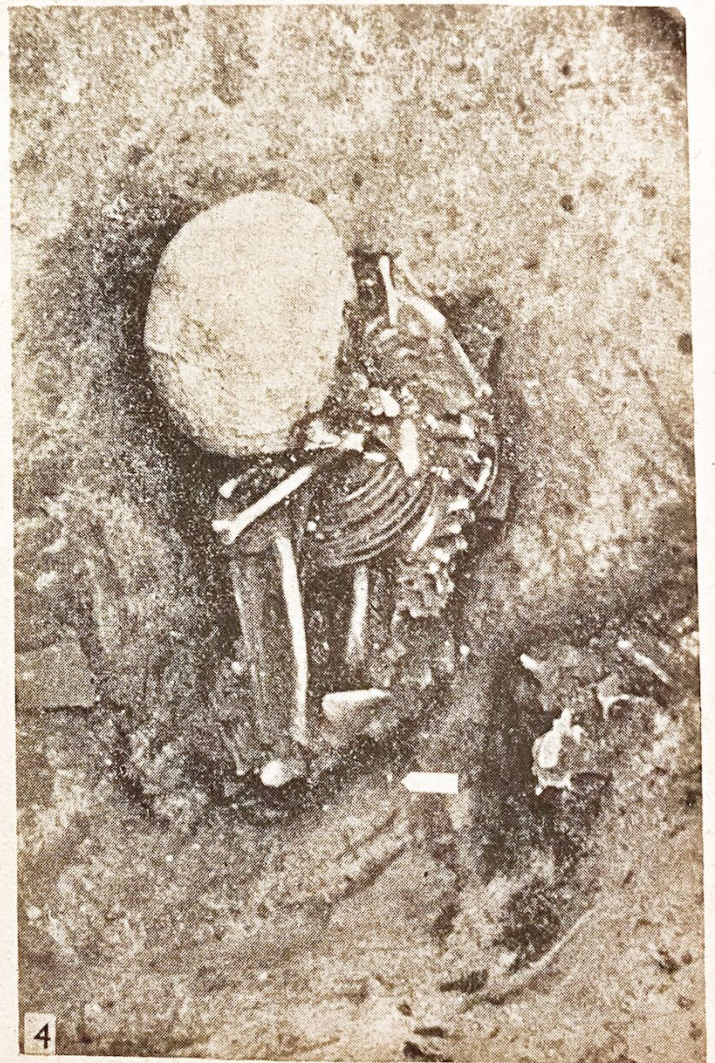
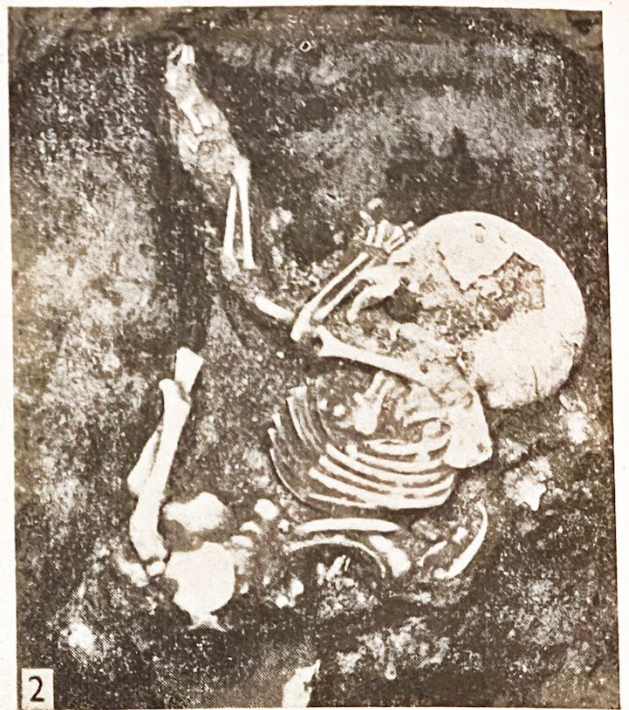
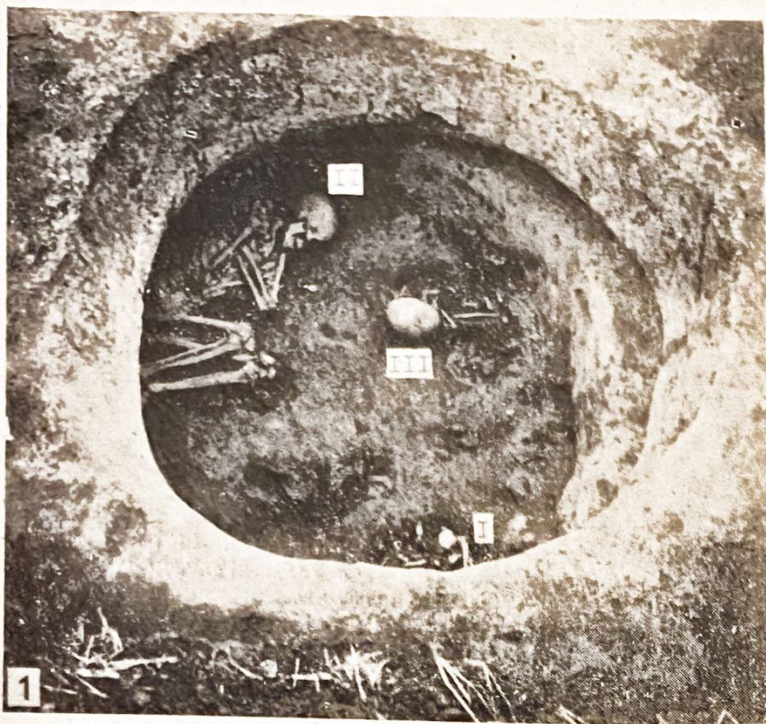


FIGURE 1. *Hulín*, district *Kroměříž*, a settlement object of the *Věteřov* group: 1 — an overall view of the settlement pit with three buried individuals (skeletons are marked with Roman numbers: I — III); 2 — skeleton No I (child 6 years old); 3 — skeleton of an adult man in the crouched position (No II — age of 25–30 years); 4 — skeleton of a child 3 years old (No III). The arrow points to the place where sample of loam was taken for parasitological analysis.



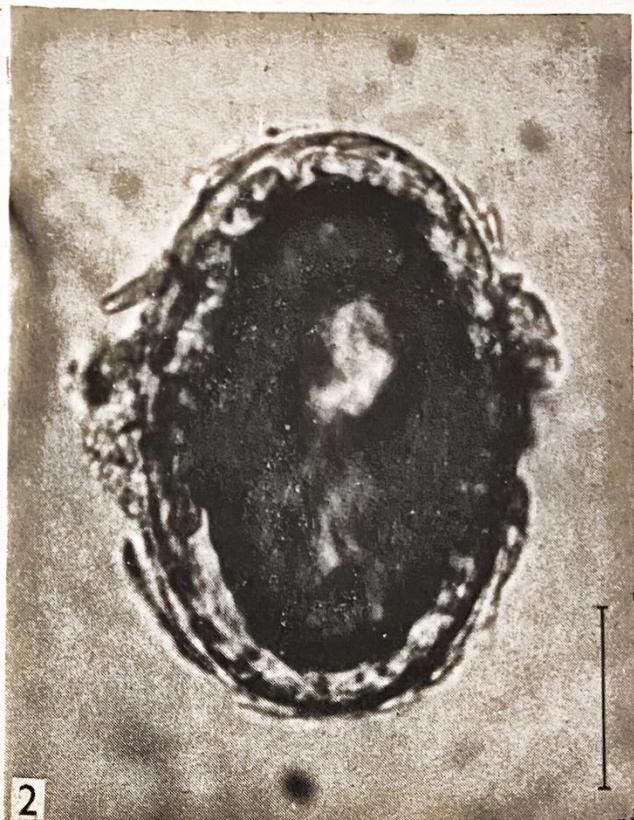
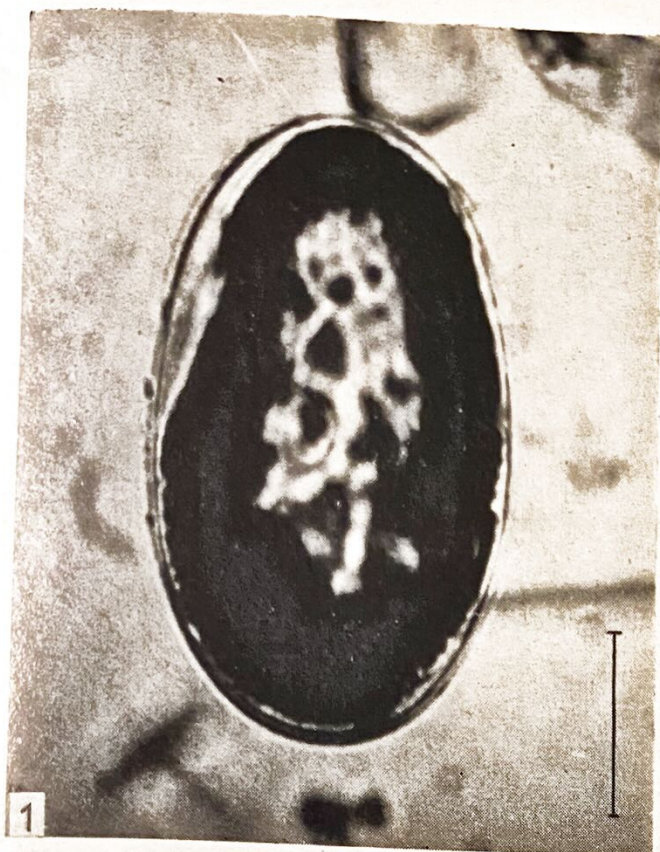


FIGURE 2. Eggs of the intestinal Nematodes found at the skeleton of the child 3 years old (No III): 1 — the egg of *Ancylostoma duodenale* (the scale — 0,02 mm); 2 — the egg of *Ascaris lumbricoides* (the same scale).

*Ancylostoma duodenale* (Dubini, 1843) — the females are 10–13 mm long and 1 mm wide, the males are 8.0–11.0 mm long and 0.4–0.6 mm wide. In our material thin-walled eggs had the dimension 0.063 by 0.043 mm, the thickness of the walls being approximately 0.001 mm.

It is distributed mainly in the warm regions (subtropics, tropics), where it causes differently serious to mortal diseases (these-called tunnel-man's disease or the brickmaker's chlorosis). In Europe it is encountered south of Czechoslovakia (Hungary, Romania, Italy, Yugoslavia). In Bohemia it was recorded in miners in North Bohemia. From the eggs of this species larvae develop in free environment, then penetrating through the skin into human body. In cold zones they can occur where there are favourable conditions for the larval development (warmth, humidity).

#### Conclusion

Parasitological examination has demonstrated the infestation by three species of Nematoda, two of which are current also in our present population. It was the child that was infested, in the material taken from the pelvic region of the adult's skeleton parasites were not found.

#### Literature

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