

## THE NIT COMBS - V. Fell

The insects were identified (by Dr J.H. Kennaugh) as human head lice (*Pediculus humanus capitis* de Geer: Order *Phthiraptera: Anoplura*).

### Comb RB89/2635

#### Plate \*\*\*

The comb is double sided with six teeth per cm on one side, and 13-14 teeth per cm on the other. It is made of box-wood (*Buxus sempervirens*), with the grain running down the teeth, which are cut at a slight angle (10-15°) to the length of the comb, along the direction of the rays.

On each side of the comb, along the line of the base of the teeth, there is an incised line made prior to the teeth, and presumably used to mark the extent of the cuts. The teeth were a maximum of 21.5mm deep, and cut from both sides, possibly by sawing.

Fragments of three lice, probably nymphs (juveniles), and moulted cuticles from five or more nymphs were recovered from this comb. One fragment of nymph (Plate \*\*\*) clearly showing a moulting claw indicates this nymph died during a moult.

### Comb RB80/77

#### Plate \*\*\*

A fragment of a double sided comb with 5.5 teeth per cm on one side and 14 teeth per cm on the other side, cut to a maximum depth of 21mm. The comb is made of box wood and the form is similar to RB89/2635 (above). There is post-burial compression damage near the fracture, and some fungal deterioration of the wood structure.

Despite containing a smaller volume of soil, a far larger number of fragments of lice and cuticles were found in this comb. Noticeable amongst these were 15 larvae or first stage nymphs, three of which were in the partly opened state (Plate \*\*\*), the remainder in the closed state (Plate \*\*\*). On the basis of size, other insect fragments may be from five or more adult lice.

**Table 1. Minimum population of *Pediculus humanus capitis* recovered.**

Comb	Nits	Early Nymphs	Other Nymphs	Moulted Cuticles	?Adults	Total insects (excluding moulted cuticles)
RB89/2635	0	0	3	5	0	3
RB80/77	0	15	18	12	5	38

## Discussion

The embryo of the human head louse, within its egg case (*c* 0.8 by 0.3mm) attached to the base of the hair follicle, develops into the nymphal stage in about nine days (Busvine, 1980 261-2). After hatching, the nymph goes through three stages of development, growth, and moulting before reaching maturity in about another nine

days, when its length may reach 4mm (Donaldson 1979, 59; Busvine 1980, 256-60). The size and form of the claws, and the form of the abdominal segments, spiracles and hairs are the principal distinguishing features between the human head louse and the human body louse.

The fragments of head louse found on the two Ribchester combs seem to be principally in the juvenile stages of the life cycle. The partly opened larvae may have just hatched before being combed from the hair, or may have died naturally hatching (J.Fletcher pers. comm.). If the former were the case, death would have occurred within an hour or two of hatching since a newly hatched insect fully expands before the sclerotin in the exocuticle cross-links and hardens. The unopened larvae were at advanced stages of development, all with clearly distinguishable claws, many with distinguishable mouth parts, spiracles and cuticular hairs, and a few internal organs. These were probably unhatched larvae which had been pulled from their egg cases for example by combing (J.Kennaugh pers. comm.). Alternatively, it is possible these individuals may be unhatched larvae from which the egg cases (which contain no sclerotin) have subsequently degraded, although this seems less likely since soft tissue, internal organs had survived in some specimens.

The lice presumably survived due to their waterlogged and anaerobic burial environment. Their fragmentary condition may be due to physical damage of the insects by combing or through post-excavation recovery and sorting of the soil residues, the moulted cuticles would be particularly fragile and vulnerable to damage. It is relevant that the only readily distinguishable features of the larval (first stage) specimens at low-power reflected light microscopy were the claws, it therefore seems probable that many insects at earlier stages of development were not recognised during sorting of the soil residues. None of the insect fragments recovered was sufficiently intact and well preserved or mature to enable sexing. Head lice do not thrive once removed from their source of warmth and food, and furthermore, are host-specific (Busvine, 1980). Thus, the specimens recovered are presumed to be contemporary with the combs and their contexts.

The apparent absence of 'nits' is probably due to failure to distinguish specimens from the soil residues though may be because they have not survived (see above). It is conceivable that the nits remained attached to the hair follicles during combing, though this seems unlikely since the spaces between the teeth of combs from Israel (Mumcuglu and Zias, 1988), have a similar density of teeth to the Ribchester combs.

Human lice are known from classical sources (e.g. Aristotle *Historia Animalium* and Pliny *Natural History*) to have been prevalent during the Roman period, and lice of various species have been found in waterlogged sites in Britain (Hall and Kenward 1990).