BRITISH NATURALISTS' ASSOCIATION

Guide to Practical Field Work With Small Mammals 2

By Roger Tabor

Interpreting Signs and Remains

Without doubt far more useful information on the normal activities of small mammals in Britain has been obtained by Longworth live-trapping than by any other single technique. (See BNA Live Trapping leaflet.) However, any technique will have a selective bias, and a pattern of field catches does not necessarily reflect the "real" picture. Gathering further information on small mammals by other means will help gain better overall perspective.

The clearest example of this is seen in the distribution of the harvest mouse. Our smallest British rodent was scientifically overlooked until recorded by Gilbert White in 1789. Sporadic records were accumulated by the Victorians. However, the introduction of a new generation of reaping machines meant that by the formation of the BNA in 1905, naturalists in the absence of any positive evidence assumed the mouse to have been almost eradicated. The advent of live trapping with Longworth traps did little to change the assessment of their declined status.

Distribution from nests

It was only during the 1970's when Stephen Harris emphasised that recording harvest mouse nests would establish a pattern of distribution that a substantial number of records materialised. Stephen Harris' survey with the Mammal Society established observations for 23 vice-counties where it was previously unrecorded. The findings led Harris to state that there was no evidence of any decline since the animal's discovery, just that it had been unrecorded. Recorders look for the characteristic ball shaped harvest mouse nest suspended from woven leaves at stalk height (around 10 – 60 cm above ground). However, this technique also has it's bias for the nests are easiest to see from September to January. The mouse longitudinally frays the leaves and weaves in long grass leaves while still leaving them attached to the plant, so the nest colour changes with the season making them hard to spot in summer. The weaving in of leaves from around a clump, however, keeps the nest upright and visible in the autumn and winter when other grasses collapse. Consequently, and not surprisingly, only under 5% of the recorded nest locations were in growing cereals. Dormice can also be detected by their characteristically different spherical breeding nests, particularly of shredded honey- suckle bark that are also above ground.

Owl Pellets

Although harvest mouse nest sightings were numerically the most productive, live trappings did produce 8.5% of the survey results. A similar proportion (almost 10%) derived from regurgitated pellets from birds of prey, of which most came from Barn Owls. Harvest mice, unless superabundant in an area, can hardly be said to be a major food item of Barn Owls, as they rarely occur in their diet at much over 1% by weight (of invertebrate prey.)

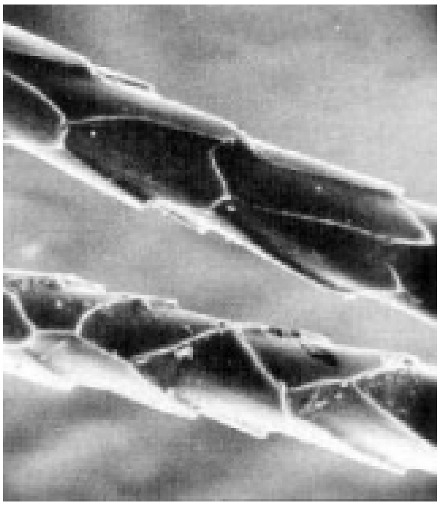
Relatively few harvest mice can be caught by Longworth live trapping in the spring and summer, while the population seems to peak during autumn and winter. Where live trapping and investigation of Barn Owl pellets have been carried out over the same area there has been the same relative lack of summer harvest mice in the owl's diet. This mutual support of two techniques lends greater confidence in interpreting the results. The Barn Owl method of hunting has a different bias to that of Longworth live-trapping. Even so, interpretation must be cautious for both techniques might be revealing that the mice may be more mobile on the ground and so more catchable in the late autumn, rather than just an increase in numbers.

Skulls, Jawbones and Teeth

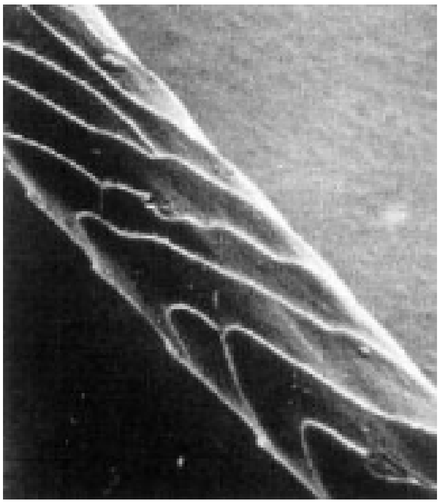
Indirect techniques not using trapping often require detective fieldcraft for identification from bone fragments, hair, droppings, food remains and so on. The distribution of the common dormouse was also established during the 1970's by Elaine Hurrell and Gillian MacIntosh's Mammal Society survey that recorded dormice from their distinctive way of opening hazel nuts with a smooth-edged hole. Owls could almost seem to have been purpose-built for naturalists interested in small mammals. Whilst most diurnal raptors, like kestrels, shatter many of the bones of their prey when they tear at it with their beaks, owls generally swallow prey whole. The woodmouse and bank vole are such a significant part of Tawny Owl diet, that if they are low in numbers then the owls' breeding success is reduced. Skulls and lower jawbones of small mammals survive both avian and mammalian carnivore digestion better that most longbones. Similarly the last evidence of a long decomposed corpse is usually the skull and jawbone rather than the longbones. Consequently, whether examining owl pellets, or fox, cat or other carnivore droppings, or bones in discarded bottles, it is worth developing an understanding of basic skull differences. For example, both bats and insectivores have a continuous row of teeth along the jaw, while rodents have a large gap between their incisors and their cheek teeth. Shrews, unlike moles or bats have long procumbent lower incisors. Voles have worn-flat cheek teeth with sides of columnar waved ridges, while the more omnivorous mice have crowned and constant rooted teeth. That the woodmouse has 4 roots to the first upper molar, while the house mouse has 3 roots, allows an easy distinction to be drawn between otherwise fairly similar skulls.

Additional useful information can be drawn from teeth for age structure of a population. For example, at the base of the long wavy teeth of bank voles, trailing roots develop with age as the columnar teeth force up, replacing worn material. The cusps of the procumbent incisors of shrews are also worn with age, but the whole body of shrews are easier to age and are normally more available than those of other small mammals. Shrew tails are invariably bald by their second summer, and the coat on the back , particularly of common shrews, is much darker in their second year. Shrews have fairly distasteful flank glands, so although readily killed by cats, are rarely eaten. As Longworth traps are rarely specifically baited for shrews, the sample provided by cats may be a more reliable index of numbers.

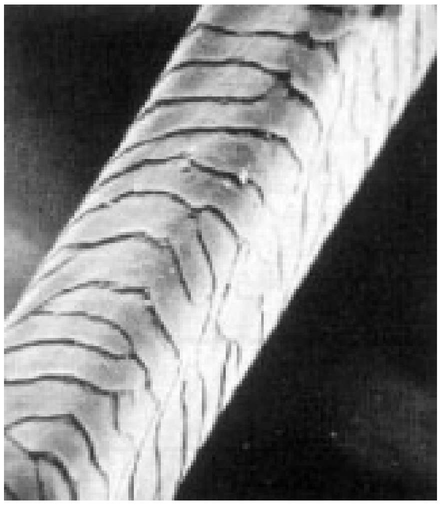
Hair



Hairs of wood mouse



Hair of rabbit



Hair of bank vole

Pictures: Scanning Electron Micrographs © Joan Hodge and Roger Tabor.

If bones are beyond recognition, even a few remaining hairs can be of great value for identification. Hair is not readily digested and consequently remains in disgorged owl pellets and carnivore droppings – even when well weathered. Viewed directly through a light microscope air spaces of the medulla within then hair can be diagnostic. However, the surface pattern of cuticular scales on hair is particularly indicative, and gelatine or thermoplastic casts can be easily made on a microscope slide and examined. Although the scales covering the hair are very fine (0.0005mm thick), being only about one hundredth of the width of the hair, none-the-less they can be felt. Take a hair and pull it first one way and then in the other direction between your fingertips. As the scales overlap with exposed edges towards the tip only, pulling from the root towards the tip gives little resistance . However, pulling in the other direction the hair drags as it catches on the scale edges. The patterns of the surface scales can be seen even more clearly under Scanning Electron Microscopy. Not only can species be identified, but with people individual differences have been detected. When making comparisons between species, with hair, don't forget the longer guard hairs are different to the under fur hairs, and that hairs can be different along their length in colour, medulla cells, cross section shape and in the surface cuticular scale patterns. For practical purposes it is useful to make up a reference set of microscope slides, for a positive identification from a few hairs can be invaluable in fieldwork interpretation.

References:

Harris, S. 1979. History, distribution, status and habitat requirements of the Harvest Mouse in Britain. **9.4.** 159 – 171.

Hurrell, E. & McIntosh , G. 1984. Mammal Society dormouse survey 1975 – 1979 *Mammal Rev*. **14**:1 1 – 18.

Tabor, R. 1999. BNA Quick Guides to Identification. *British Naturalists' Association*

Tabor, R. 2001. Practical fieldwork with small mammals. Live trapping. *British Naturalists' Association*