NOTES ON BRITISH MAMMALS

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GROOMING BY VESPERTILIONID BATS

This note is based on observations made on captive Vespertilionid bats of the following species : noctule (*Nyctalus noctula*), pipistrelle (*P. pipistrellus*) serotine (*Eptesicus serotinus*), Daubenton's (*Myotis daubentoni*) whiskered (*M. mystacinus*), Natterer's (*M. nattereri*) and long-eared (*Plecotus auritus*).

Most of the individuals concerned were captured during the summer, kept in captivity for up to 6 or 8 weeks and then released but some were either captured during the winter or for some other reason kept for a much longer period, up to 6 months, before being released. Each bat was fed by hand until it could be trained to feed itself from a dish placed on the floor of its cage, when food was put into the dish at about dusk every evening. After the bat had fed and gone back to roost more food was put into the dish to be eaten later during the night. The food given was as varied as the season of the year allowed. Meal worms and blow fly pupae were the foundation, supplemented by moths, beetles, crickets, water boatmen and other insects. These were decapitated so that they could not escape from the dish and left for the bat to find and eat. If no insects were available cream cheese or a mixture of cream cheese and hard-boiled egg yoke was given ; calcium boro-glucionate and a smear of halibut oil were added at intervals.

The behaviour at feeding time of each bat of both sexes and every species followed a very similar pattern. Having fed, the bat climbed back to its roosting place and, head uppermost, urinated and defæcated. The fæces seemed to be from the meal just consumed. Two noctules were fed on a proprietary dog food, the fæces from which were pink and softer than those from moths, beetles and meal worms, and easily recognized. On three occasions these bats were given a half ration of the proprietary food and, after some frustrated searches round the feeding dish, climbed up to pass pink fæces and then went on to groom. They were left for about an hour or so, by which time they were asleep, were then taken down, warmed up and given beetles and meal worms after which they passed normal, firm, dark coloured fæces with a slight tinge of red in them. These observations indicate a very rapid food passage rate in bats. On one occasion in a noctule bat, the process was timed and from " first bite " to first resultant fæces was 28 minutes.

Having passed its fæces the bat would meticulously groom itself all over. This usually started by letting go with each hind foot alternately and scratching the whole of that side of its body with the claws. The articulation of the hind limb allows this to be done over the root of the tail to the far side of the rump

and also by reversing the foot, to the anus and underside of the interfemeral membrane, as well as all over the rest of the body. If the lips and the throat had been covered with insect juices, scales from moth wings or cream cheese these parts were often the first to be cleaned. Throughout, the bat removed the debris collected on its claws with its mouth. The wings were mainly cleaned with the mouth, the membrane being licked and passed between the teeth and then stretched out to be " polished " by rubbing the muzzle and crown of the head against it. The interfemoral membrane was cleaned in the same way. Having finished grooming, the bat would go to sleep, though it would sometimes turn head upwards to urinate and defæcate again before sleeping.

On a number of occasions a male whiskered bat (*M. mystacinus*), captured with testes regressed during hibernation in 1959 and kept alone, was seen to be biting at a pink protuberance near the anus when grooming with its head between interfemoral membrane and belly. This looked like a similar protuberance, apparently the everted rectum, which common shrews (*Sorex araneus*) can sometimes be seen to be biting or sucking, an activity which was first described by Crowcroft (1952). In the case of this particular bat, which never became very tame, it was not possible to determine whether the organ seen was the penis or an everted rectum.

Nothing of the same nature was seen in any bat of either sex until a male noctule (*Nyctalus noctula*), captured with testes just beginning to swell in July 1963, was kept in captivity for a period of 5 weeks in company with a female captured at the time. This bat became exceedingly tame and when fed in the hand would subsequently follow the whole post prandial procedure described above while hanging from a forefinger. It would turn head uppermost, urinate, defæcate, turn head downwards, groom and go to sleep. It would continue grooming if, for example, a wing was pushed aside to see what it was doing. On eight successive evenings it was seen to be biting at a pink protuberance by its hinder quarters. This could clearly be seen to be the turgid penis : on two evenings the bat was turned over and held on its back until the penis resumed its normal size. It seems probable that the organ seen in the whiskered bat in 1959 was in fact the penis and not an everted rectum, though in both cases at first glance it resembled closely what can be seen in shrews during refection. Refection may occur in bats, but in males a pink, turgid penis can easily be mistaken for an everted rectum.

REFERENCE

CROWCROFT, P. (1952). Refection in the common shrew. *Nature, Lond.* **170** : 627.

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FIELD MICE AT HIGH ALTITUDE IN CO. KERRY, IRELAND

In mid-September, 1964, trapping was carried out on screes about 100 feet below the summit of Carrantouhill (3,414 feet) in the MacGillicuddy Reeks,