

Fragmenta Theriologica

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BEHAVIOUR OF BATS DURING THE TOTAL SOLAR ECLIPSE
IN POLAND ON JUNE 30TH, 1954

ZACHOWANIE SIĘ NIETOPERZY W CZASIE CAŁKOWITEGO
ZACMIENIA SŁOŃCA W POLSCE W DNIU 30 CZERWCA 1954 ROKU

I made the above observations at Puńsk near Trakiszki, where I found a bat colony in the gaps between the wall and the metal roof of the left aisle of the church. They were of a small species distinguished by their swift and strong flight. Despite the cold and wind bats from this colony hunted, together with other species, in large numbers during the evening of June 29th.

June 30th 1954 was on the whole sunny, almost windless, temperature +18° — +19° C., atmospheric moisture content 80—85%, pressure 742—743. The total eclipse took place at 1.33 p.m. Greenwich mean time, and lasted 2 min. 6 sec. Darkness fell suddenly when the moon completely eclipsed the sun, then later disappeared equally rapidly. During the partial eclipse it was not darker than on a very cloudy day. Throughout this time no bats were to be seen in the air, although I kept a close watch on the area, among others, in the immediate vicinity of their hiding-place. Since, however, the bats were hidden in deep gaps where in any case it was always dark, I should have been very surprised if they had flown out. Even if they had

noticed the darkness, it probably lasted too short a time for these mammals to make the decision to leave their hiding-place. In addition, according to Griffin, and Welsh (1937) and Kowalski (1955) at least certain species of bats belong to the group of animals with an endogenic rhythm of 24-hour activity, to use Park's term (1940).

The only work I know of referring to this question is that by Wheeler et al. (1936) who states that during the total solar eclipse on August 31, 1932 in New England (U.S.A.) bats were observed in flight, even in the 98—100% totality belt. According to these authors a similar reaction by bats was observed during the total solar eclipses in 1706 and 1900 (since the works in question were not cited, however, I was unable to obtain details of these eclipses).

Discussion of the above differences in observations is difficult, as the authors failed to give a whole series of extremely significant meteorological data, not only concerning the actual site of the observations, but even in New England as a whole. Not even the time nor the total solar eclipse was stated, but I was able to obtain these data thanks to the courtesy of the Warsaw Astronomical Observatory. The eclipse lasted in the most favourable places for a maximum of 1 min. 39 sec., so I am therefore certain that it lasted for a considerably shorter time on the observation sites, since, as previously mentioned, bats were seen in flight even in the 98—100% totality belt. It took place about 4.42-4.50 p.m. Greenwich mean time. As far as the emergence of the bats is concerned, the short duration of the eclipse in relation to that in Poland could be compensated for by the following circumstances:

- a) it began a much shorter time before sunset;
- b) according to one of the observers the sky was covered by clouds; if this was the case on all the observation posts, it was even darker;
- c) at one observation post the temperature was 29.4° C., which increased the sensitivity of the bats, being poikilothermic mammals;
- d) the eclipse took place two months later, at the end of summer, when the bats are more inclined to fly out in the daytime in search of food;
- e) the species of bat in question are different (there are no species common to both the Old and the New World) and may possibly be more sensitive to variations in light intensity. (N.B. *Lasiurus borealis* Müller and *L. cinereus* Beauvois which hang from the branches of trees, can at once perceive such changes. Bats with similar properties to these do not occur in Europe).

Doubts arise as to the interpretation of observations of bats in New England; it is a fact that of 498 observations of animals made at that time, a total of only 5 bats in all was seen(!) that is, only an insignificant percentage of their population reacted to the phenomenon. It is also possible that the bats were already in flight before the eclipse on account of their daytime autumn wanderings, or that at this time of the year they not infrequently hunt in the daytime. The observers paid attention to this phenomenon only during the eclipse and applied to it the principle: *post hoc ergo propter hoc*. In addition the observers have in general a tendency to

note positive, but not negative facts; and indeed the appearance of bats has so far been observed during three eclipses only. The appearance of bats in 1900 in Portugal in the middle of winter is worthy of note, when the eclipse took place „on a bitter cold morning shortly after sunrise” (Wheeler et al., l.c.) even though it had the maximum period of duration (7 1/2 minutes).

In summing up it must be stated that the behaviour of bats during an eclipse depends on so large a number of factors that it is impossible either to generalise over that matter.

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DAYTIME ACTIVITY OF *NYCTALUS NOCTULA* SCHREB.

MROCZEK BOROWIEC (*NYCTALUS NOCTULA* SCHREB.)

POLUJĄCY W DZIEŃ

On October 13th 1957 at about 12.30 p.m. at Puławy I saw one individual of *Nyctalus noctula* Schreb., mainly flying above the road which is bordered on both sides by forest. The bat flew backwards and forwards at a height of 10—30 m., over a limited area, from time to time making sallies into the forest. It was clearly evident from its movements that it was hunting for insects. It uttered loud squeaks completely different from those uttered by specimens of this species during their evening flights; they were also different from the sounds made during the day by the colonies of this species in tree holes. The day was sunny, completely cloudless, and almost no wind, temperature +14° C.

Data in literature on the daytime flights of bats most often refer to *Nyctalus noctula* Schreb. and this species is well-known for being the earliest of the European bats to fly out in search of food. It is also a known fact that bats fly especially often in the daytime during the migration period (Allen, 1940; Bauer, 1955; v. Finckenstein & Schäfer, 1934; Neubaur, 1954; Schweppenburg, 1923; Stadler, 1922 and others), at the same time catching insects. In addition, daytime flights take place, independently of migration, in the spring and particularly in the autumn, when the nights are so cold that there are very few insects about (Ryberg, 1947; Löhrl, 1955). Also, at these times of the year, several species of bat leave their hiding places earlier in the evening than in the summer (Altum, 1872; Vesey-Fitzgerald, 1949). Löhrl (l.c.) states that *N. noctula* hunts regularly in the autumn between 3 and 4 p.m.,