A MID-WINTER COLONY OF *BOMBUS TERRESTRIS* L. (HYM., APIDAE) IN DEVON

BY ALASTAIR ROBERTSON

Reports of the emergence of very early spring queens in Britain are occasionally made, particularly of *Bombus terrestris* L. Prys-Jones (1982) cites a handful of examples of December and January reports. These queens are generally assumed to represent individuals that were stimulated to break diapause by unusually warm weather. However, I am unable to find any reports of workers from January or February and it is usually assumed that these very early queens fail to establish successful colonies. According to Sladen (1912) the majority of nests of this species are not started until May.

It was with great surprise then, that one of my colleagues (Dr David Stradling) claimed that he had seen an individual *Bombus* foraging on a shrub of *Lonicera* sp. on the campus of Exeter University on 31.i.1990. From his description it appeared that it was a worker of *B. terrestris*. Without a specimen it was not possible to confirm this observation. However on 5.ii.1990 on a particularly warm day, at least three queens and many workers were again seen foraging on *Erica* spp on the campus. This time specimens were caught and identified by Dr Clive Betts definitely as *B. terrestris*. Workers and a queen were seen again on 15.ii.1990 and on several subsequent days suggesting that the colony (or colonies) had been successfully established. On 21.ii.1990 and 22.ii.1990 queens of *B. lapidarius* L. were also captured and identified. Sladen (1912) records that *B. lapidarius* queens do not usually appear in Kent until May. Betts (1986) lists this species as first appearing in April. Thus, the record here from mid-February is two or three months earlier than usual.

The presence of workers of *B. terrestris* in January means that a colony has been successfully established before this date. The fairly large size of the workers captured (approximately 14 mm long) suggests that these workers were not the first queen-raised individuals as these are usually tiny (Alford 1975), and that the colony had already been established for several weeks, pushing the foundation date back to early January or perhaps even December.

Sladen (1912) notes that in North Africa, *B. terrestris* breeds in the winter and sleeps in the summer. A similar situation apparently also occurs in Corsica (Ferton 1901). Such a reversal of seasonal pattern demonstrates that this species, given the appropriate environment, can alter its behavioural pattern. It is not clear whether this difference is genetically determined or entirely induced by the environment. The winter of 1989–1990 has been unusually mild (though very wet and

windy) in Devon. It seems probable that the mild weather stimulated early emergence of queens and the continuing warm weather has allowed successful establishment. The campus is well-supplied with winter forage and as such may provide an unusually favourable site for early nest establishment.

The possibility that the workers observed had somehow overwintered seems less likely. The age of a worker can be estimated approximately by wing-wear (Prys-Jones 1982). An old worker will show considerable fraying of the wing margins. An individual with little or no damage to its wings is likely to be young. None of the workers captured showed any sign of wing damage, so are unlikely to be from the previous season. It is possible that a *colony* has overwintered and continued to forage and produce new workers right through the winter. *B. terrestris* is known to overwinter as colonies in climates where the winter is mild, e.g. New Zealand (Cumber 1954, Gurr 1973). However, again one might expect that at least some of the workers would appear to be old and worn.

The most satisfactory explanation for the observation of workers in February seems to be that colonies were successfully established from queens that were stimulated to end diapause by unusually warm weather. Devon normally experiences mild winters and this season has been unusually mild, so the occurrence of early nests may not seem to be surprising in this light.

The progress of these colonies will be monitored over the next few months to see if they survive through to the summer and whether this leads to early formation of sexuals and the chance of a second cycle. In addition to *B. terrestris*, *B. lapidarius* queens have also emerged early and other early species such as *B. pratorum* might also be expected, so attempts to look for these will be made.

REFERENCES

Alford, D.V., 1975, *Bumblebees*, Davis-Poynter, London. **Betts, C.,** 1986, *A supplement to The Hymenopterist's Handbook*, 2nd ed. The Amateur Entomologists' Society. Hanworth, Middlesex. **Cumber, R.A.,** 1954, The life cycle of humble-bees in New Zealand. *N.Z. Jl Sci. Technol.* **36**: 95–107. **Ferton, C.,** 1901, Sur l'epoque du reveil des bourdons et des Psithyres à Bonifacio. *Annls Soc. ent. Fr.* **70**: 84–85. **Gurr, L.,** 1973, Evidence of overwintering nests of *Bombus hortorum* and *Bombus ruderatus* in New Zealand. *N.Z. Ent.* **5**: 339–341. **Michener, C.D.,** 1974, *The social behavior of the bees: a comparative study*. Harvard University Press. Cambridge, Mass. **Prys-Jones, O.E.,** 1982, *Ecological studies of foraging and life-history in bumblebees*, PhD Thesis, Cambridge. **Sladen, F.W.L.,** 1912, *The Humble-Bee, its life-history and how to domesticate it*, (Macmillan) London [Reprinted Logaston Press, 1989].

Department of Biological Sciences, University of Exeter, Hatherly Laboratories, Prince of Wales Road, Exeter EX4 4PS.
March 7th, 1990.