Bird/Spider Relationships

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More than 1,200 species of Australian spiders have been named and described and probably many hundreds still await the attention of the systematist. It is natural, therefore, that in a country with such a rich spider fauna extensive use should be made by birds of the silk which is a characteristic product of these creatures. In Cayley's *What Bird Is That?* 124 species out of 701—nearly 18 per cent.—are mentioned as using cobwebs or cocoons, or both, for binding the nesting material or decorating the exterior. That the spider's silk is an ideal medium for binding purposes is evident from its viscid nature, its great tensile strength, which is second only to that of fused quartz fibres, and its elasticity. It is safer perhaps not to accept the recorded number of 124 species as mathematically exact and invariable, but it represents a minimum and is therefore reliable as an indication of the extent to which the spider's silk is used by Australian birds. Of the recorded total 34 species build dome-shaped nests, the predominant groups being Warblers (9), Thornbills (13) and Wrens (5). Being expert weavers of plant stems, the Finches do not seem to have exploited cobweb, and its use is not common among birds of the heathlands. The 90 species which use silk in constructing cup-shaped nests represent widely-different groups with diverse habits, and it appears that the use of this material is not conditioned primarily by habitat, type of nest, or availability. The nest pattern is inherited, and subjective influences, expressed by preferences, provide at least a partial explanation.

Silk is used to a varying extent by species which build dome-shaped and cup-shaped nests. Describing the manner in which the Rock-Warbler (*Origma rubricata*) suspends its nest from the roof of a cave, or some other chosen spot, Hindwood[1] writes:

> The supporting flat mass of silky spiders' webs is composed for about two inches, sometimes less, often more, entirely of this material, after which the globular-shaped nest of root fibres, moss, bark fibres and grass is gradually built in, the spiders' webs extending for another three or four inches before being superseded by the main structure. The outside of the nest is partly covered with cob-webs or pieces of bark fibre or with both, and at times with the egg-bags of spiders.

Among species which build cup-shaped nests the Willie-Wagtail (*Rhipidura leucophrys*) uses so much silk that the outside of the nest has a matted, greyish appearance. The nests of the Rock-Warbler and Willie-Wagtail probably represent the maximum usage of cobweb but its advantages as a binding material are exploited in varying degrees by numerous species. The silk is collected in, or on, the beak,

and applied with sweeping movements of this efficient "trowel" while the bird is sitting in the bowl of the nest. I observed a Restless Flycatcher (*Seisura inquieta*), which had failed to wipe off a strand of web, experience difficulty in removing the material by repeatedly scraping it against a branch.

Spiders provide silk for nesting purposes and also serve as food for birds. McAtee[2] states that 91 per cent. of the arachnids captured by birds are spiders. A group of 81 nearctic birds had from 10 to 49 captures each; 28 birds from 50 to 99; 15 from 100 to 199; two additional above 200; one more above 300. Individual records are: English Sparrow, 420; Eastern Meadow-Lark, 425; Crow Blackbird, 621; Starling, 631; and Crow, 722. Of the spiders found in bird stomachs only a small proportion (less than 8 per cent.) could be identified, but McAtee claims that many of these belonged to cryptically-coloured groups or the formidable wolf-spiders, and that "availability" is the principal factor in the bird's choice. More interesting still are the 134 records of the cocoons of spiders being devoured, showing that "even these quiescent stages do not escape the birds." McAtee concludes: "In bulk spiders do not ordinarily form any considerable percentage of the total food of birds, but the proportion runs as high as 6 per cent. and 8 per cent. of the annual diet in the case of certain song-thrushes and flycatchers."

Lea and Gray[3] list 115 species of Australian birds which include spiders in their diet, but wisely admit that "a very much larger number of individuals must be examined, and that such points as habitat, time, and weather conditions of the year—particularly for birds of the dry areas—taken into consideration, before definite opinions can be expressed." I have observed Sparrows, Willie Wagtails, and Restless Flycatchers hunting for spiders under eaves or along fences, and one Restless Flycatcher picked off the legs of a large spider before feeding it to a nestling.

Apparently the venom contained in the poison glands of spiders has no harmful effect on birds or their young when swallowed with the food. According to Savory[4] the venom is a strongly alkaline fluid soluble in water and insoluble in alcohol or ether. More than one kind of poison may be present. Walbum, for example, has shown that the body of a common English garden-spider (*Epeira diadematа*) contains four poisons, one of which is found in the developing eggs and has a constituent strong enough to kill cats or mice if injected subcutaneously. Another poison is in the spider's blood and a fourth is in the digestive fluids.

Apart from the nesting material and food relationships between spiders and birds, the only other kind of association is recorded by Layard, whose description of the nest of the Double-collared Sunbird (*Cinnyris chalybeus*) in South Africa is quoted by Moreau.[5] The nests are made of

cob-webs stuck over with bits of dead leaves and chips, and "exactly resemble the masses made . . . by one of our commonest [South African] spiders. I have more than once seen an inhabited spider's web forming part and parcel of the nest. Whether the nest was built in the spider's web, or whether the spider found it in a convenient place and selected it herself, or was brought in with a bit of web by the bird and then took up her abode and enlarged it, I cannot tell; but there the incongruous allies live."

Many animals which exhibit bright colours are either dangerous or unpalatable. Rainbow[6] refers to two Australian spiders, *Erioden rubricapitatum* and *Latrodectus hasselti*, which display red as a prominent part of their colour scheme, and comments that although they are common their bodies "are never found in the crops of insectivorous birds nor, so far as I can find, in the nests of wasps."

REFERENCES:
1. *Emu*, vol. XXVI, p. 14 (at p. 18).
2. "Protective Adaptations in the Animal Kingdom," *Smithsonian Miscellaneous Collections*. vol. 85, no. 7.
3. *Emu*, vols. XXXIV and XXXV.
4. *The Biology of Spiders*, p. 130.
5. *Ibis*, vol. VI, no. 3. p. 462.
6. *Aust. Nat.*, vol. I, part IV, p. 43.

Stray Feathers

Frogmouth on the Ground.—A pair of Frogmouths has built in the trees round our home for the last three years: always in some tall fir trees. This season we were interested in the fact that the bird was on the nest for six weeks. When we went out at nights with a torch a bird was always sitting. The site was very high up in the tree so we could not see into the nest. Eventually one young bird hatched out. Lately the family sat every day in a large cherry tree just outside our verandah, one adult and the young one on one bough, and the other parent by itself. One day, after seeing them all in such a position, I was surprised, when I went out about ten minutes later, to see one of the adult birds on the garden path, in the sunshine, with its wings at full stretch. I thought something must have happened to it, but when I went nearer to look more closely it flew away into a neighbouring oak tree, so I can only conclude it was sunning itself. I mentioned this to Dr. O'Ombrain, and he suggested that I should send a note to you about it.—(MRS.) A. M. LAWRANCE, Glen Innes, N.S.W., 8/2/40.

Eggs of the Australian Dotterel.—On page 155 of the January *Emu* (vol. XXXIX) I refer to the unusual green colour of eggs of this species. Looking through my volumes of the *South Australian Ornithologist* I now notice that in volume V, at page 51, Mr. McGilp, in an article on the species, says that "the eggs, when freshly laid, are of a