

FROM FIELD AND STUDY

Early Technique in the Making of Bird-skins.—Charles Waterton, a naturalist of Yorkshire, England, made five voyages to Guiana in the period between the autumn of 1804 and the close of 1824. In 1825 he published an account of all his voyages save the first one, in a book entitled "Wanderings in South America, the North-West of the United States, and the Antilles, in the Years 1812, 1816, 1820, and 1824; with original instructions for the perfect preservation of birds &c., for cabinets of natural history."

Although written in the formal style of that period, the book is truly interesting. During the 1812 journey, Waterton sought for and obtained a small amount of the arrow poison used by the natives of Guiana, which he took to England for experimental purposes. Subsequently he collected birds, mammals, and reptiles, and had numerous adventures exhilarating to a naturalist, one of which was the capture of a ten-foot alligator by the native Indian method.

Waterton's directions for the preparation of birds is of considerable historical interest, I believe, but as they are too long to quote in full, the chief steps are given in the following summary:

Fill the mouth and nostrils with cotton. Lay the bird on its back on your right knee with the bill toward the left shoulder. Part the feathers in the mid-line and make an incision through the skin from the breast to the vent. Separate the skin as far as the middle joint of the thigh and cut this through. Place cotton between the skin and the body. Do the same on the other side.

Place the bird perpendicularly with breast on knee, back toward you, and separate the skin on each side of the vent. Cut across this to the backbone near the root of the tail. Sever the backbone. "Apply plenty of cotton." Push the skin back until you come to the wings and cut these through close to the body. Push the skin gently back over the neck and head, cut out the roots of the ears, and continue until the eyes are reached. Cut quite through the nictitating membrane and arrive at the root of the bill. Remove the body and most of the skull. Return the head through the inverted skin.

Now proceed to the wings. With thumbnail and forefinger push the skin off the middle joint of the wing and remove all the flesh. "Tie a thread about four inches long to the end of the bone," and put the bone back in place. Next, skin the thigh quite to the knee, cut away all the flesh and tendons, and leave the bone; form an artificial thigh around it with cotton, and draw back the skin. "Tie together the two threads which you had fastened to the ends of the wing joints, leaving exactly the same space betwixt them as your knowledge of anatomy informs you existed there when the bird was entire."

Introduce cotton for an artificial body by means of a little stick like a knitting needle, "and without any other aid or substance than that of this little stick and cotton, your own genius must produce those swellings and cavities, that just proportion, that elegance and harmony of the whole, so much admired in animated nature and so little attended to in preserved specimens." Sew up the orifice in the belly, beginning at the vent.

It is probable that in Waterton's time all specimens were mounted. He gives in his description some further directions for treatment to that end, such as the insertion of glass eyes, tacking the thighs to the body, etc. For a preservative he used a solution of mercuric chlorid in alcohol, by means of a swab. Regarding its efficiency he says: "Perhaps it may be satisfactory to add here, that some years ago I did a bird upon this plan in Demerara. It remained there two years. It was then conveyed to England, where it stayed five months, and returned to Demerara. After being four years more there, it was conveyed back again through the West Indies to England, where it has now been near five years, unfaded and unchanged."

Comparing the directions given by this early traveler with a description of our present technique, such, for example, as given by Chapin in the American Museum leaflet, it is interesting to note that there are only minor differences between them—a few refinements only. Coues does not mention the device of tying the wing bones together. I believe we may say that Charles Waterton was the originator, over a hundred years ago, of the modern method of making a bird-skin.—C. H. WOOD, *Glendora, California, February 18, 1925.*

Casualties among Birds.—During the nesting season of 1924 the writer kept, wherever possible, complete data on all nests visited. This was for the purpose of getting some idea as to the casualties in the nest, due to natural causes. In order to do this the following items were noted:

1. The actual number of eggs laid.
2. The number of eggs hatched.
3. The number of young birds that lived long enough to fly from the nest.

The following table is compiled from the data obtained.

Name	Nest no.	Eggs laid	Eggs hatched	Young which left nest	Per cent eggs hatched	Per cent young that left nest	Pct. eggs which produced adults	Per cent casualties
California Quail	1	8	destroyed	0	0	0	0	100
	2	6	destroyed	0	0	0	0	100
	3	12	destroyed	0	0	0	0	100
		26	all destroyed	0	0	0	0	100
Barn Owl	1	4	3	1	75	33	25	75
California Screech Owl	1	2	abandoned	0	0	0	0	100
	2	3	3	2	100	67	67	33
	3	4	4	3	100	75	75	25
	4	3	destroyed	0	100	0	0	100
		12	7	5	58	71	42	58
Black Phoebe	1	4	4	4	100	100	100	0
	2	4	destroyed	0	0	0	0	100
		8	4	4	50	50	50	50
Western Flycatcher	1	3	3	3	100	100	100	0
Coast Jay	1	4	4	2	100	50	50	50
California Jay	1	4	abandoned	0	0	0	0	100
	2	4	3	3	75	100	75	25
	3	3	3	3	100	100	100	0
	4	4	4	4	100	100	100	0
		15	10	10	67	100	67	33
California Towhee	1	3	2	2	67	100	67	33
San Francisco Towhee	1	4	deserted	0	0	0	0	100
	2	4	4	2	100	50	50	50
		8	4	2	50	50	25	75
Black-headed Grosbeak	1	4	4	3	100	75	75	25
	2	4	destroyed	0	0	0	0	100
	3	4	4	2	100	50	50	50
	4	4	4	2	100	50	50	50
		16	12	7	75	58	44	56
House Finch	1	5	deserted	0	0	0	0	100
Golden Pileolated Warbler	1	5	5	5	100	100	100	0
	2	4	3	3	75	100	75	25
		9	8	8	90	100	90	10
Coast Bush-tit	1	6	destroyed	0	0	0	0	100
	2	6	6	0	100	0	0	100
	3	7	6	0	86	0	0	100
	4	5	5	5	100	100	100	0
	5	6	3	3	50	100	50	50
	6	6	destroyed	0	0	0	0	100
	7	10	10	10	100	100	100	0
	8	5	3	3	60	100	100	40
	9	6	3	3	50	100	50	50
	10	6	destroyed	0	0	0	0	100
	11	5	5	5	100	100	100	0
	12	6	5	3	83	67	50	50
		74	46	32	62%	70%	43%	57%
GRAND TOTAL	38	187	103	76	55%	74%	41%	59%

The above table shows data on 38 nests examined, and of this number, 13 or 34% were either abandoned or destroyed. The total number of eggs found in these nests was 187, and of this number only 103 or 55% hatched, and only 76 or 74% of the young that hatched, ever lived to be old enough to leave the nest. Of the total number of 187 eggs laid, only 76 or 41% ever developed into birds old enough to leave the nest. This makes a total casualty record of 59%.

The California Quail shows a casualty of 100% on the three nests found; and when a weighted average is taken the Bush-tit would come next, with a casualty of 57% in the 12 nests examined. Of the quails' nests, one was destroyed by a gopher snake, and the others were destroyed by unknown agents. The Screech Owl nests nos. 1 and 4 belonged to the same female, as I had banded her in the first nest. The Black Phoebe nest was knocked from the beam that it was built upon, probably by small boys, a very natural enemy of the bird. The Bush-tit nests that were destroyed all had holes in the side, as though some jay or predatory animal had destroyed them for the eggs. The House Finch's nest was built where several hundred people passed within ten feet of it, each day, and this circumstance may have been the cause for its desertion.—ERNEST D. CLABAUGH, Berkeley, California, February 28, 1925.

Nesting of the Sage-hen in Siskiyou County, California.—In the vicinity of the Charles Laird ranch on the west shore of Lower Klamath Lake, the Sage-hen (*Centrocercus urophasianus*) has long been known to be a common bird. About a mile south