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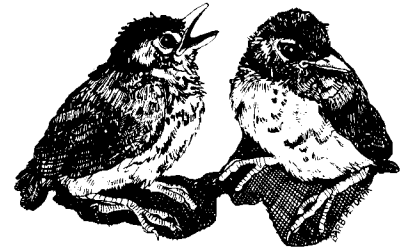
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Raising altricial birds

Hannah Bonsey Suthers



Notes on substitute diet and diseases

In two previous papers I made suggestions on how to handle and feed car-stunned birds of prey (1970) and how to care for an assortment of other sick, injured, or orphaned small birds (1973). Here I discuss simpler alternatives to the complicated food mixtures made by aviculturists for hand-raising orphans. I also attempt to give reasons for failure, other than the simplistic explanation of sudden change in environment and food: dehydration, malnutrition, and disease. Simple experiments suggest some answers.

Dehydration. How much liquid does a hand-raised nestling need? Some workers (e.g. Kale, 1972) feel that moist mixes fed by forceps or spatula provide adequate moisture. Some (e.g. Mitterling, 1967) give supplementary water by placing a dropper well down the throat. Others feed a soggy mixture of food by dropper.

The danger of giving water or food by dropper is that the bird may drown or gag. If the bird does not swallow readily, water or food gets into the trachea.

The danger of providing no supplementary liquid is dehydration. Part of the dehydration comes as a side effect when the babies are brooded. The simple incubator — a terrarium with covered light bulb — can cause dehydration unless a dish with a wet sponge is placed in it. The skin over the abdomen, almost taut on a very young bird, wrinkles considerably if dehydration is taking place. Weight loss is rapid, the bird becomes lethargic and dies.

To determine the amount of moisture received in natural foods, I collected and froze samples of white grubs, earthworms, wireworms, mulberries, and a substitute food — ground beef chuck. The samples were thawed, weighed on a Mettler H 20 balance, and dried in a drying oven at 26.5 in. vacuum and 60°C until weights stabilized — about 10 weeks. The ratio of moisture loss to total weight was calculated. The results are shown in Table 1. Table 2 lists the percent moisture according to the labels of selected substitute foods.

Even the moist substitute foods have less water content than natural foods. Baby birds obviously need supplementary moisture. Why not let them decide how much? Water can be offered safely by touching the side of the beak with drops of water on the finger. I do this after each feeding. The babies learn to snap up the drops eagerly. A shake of the head indicates refusal — enough.

A feeding experiment. The human foster parent needs a quick source of food, readily digestible by the bird, and in small amounts that will not spoil. Elaborate mixes which come by the quart are not practical. However, each substitute has its drawbacks. Turkey starter mash has high protein, but not all birds can handle poultry food efficiently. Starlings are an example (Thompson and Grant,

Table 1. Water content of natural foods and ground beef, determined by drying in a vacuum oven.

	Starting weight (gms)	Final weight (gms)	Weight loss (gms)	Percent moisture
6 white grubs	7.8	1.5	6.3	80.8
17 white grubs	4.2	0.6	3.6	85.7
2 white grubs	2.6	0.7	1.9	73.1
12 earthworms	6.3	1.2	5.1	81.0
1 wireworm	44 mg	14 mg	30 mg	68.2
¼ cup mulberries	26.4	3.3	23.1	87.5
1 tsp ground beef	6.0	2.4	3.6	60.0

Table 2. Water content and nutrients of substitute foods — percent. (Data taken from labels.)

	Moisture maximum	Crude protein minimum	Crude fat minimum	Fiber minimum
Gainesburger	33	18	7	3
Gaines Top Choice	33	18	7	3
Ken-L Burger	36	19	7	3
Ken-L Ration, canned	75	10	2.5	1
Ken-L Ration meal, dry	10	23	7	5
Purina Dog Chow, dry	12	21	8	4.5
Geisler Mynah Pellets	6	28	3.9	5
Turkey Pre-starter		30	4	4
Turkey Starter Mash		28	4	5
High Protein Chicken Growing Mash		22	4.6	3

Table 3. Starling feeding experiment (1974)
(Diet and weight in grams)

Gainesburger, milk:water 1:3, and vitamins			
Band color	17 May	19 May	20 May
No band	66.1	48	died: diagnosis E. coli
Red	65.9	57	died: diagnosis negative
Yellow	67.9	58	lethargic, not gaping
Green	65.7	58	trembling
Yellow band switched to ground beef chuck, milk:water 1:3, vitamins			
Green band switched to mealworms, milk:water 1:3, vitamins			
Band color	21 May	23 May	24 May 27 May
Yellow	67	57	62.5 72 healthy
Green	63	59	62 67 refusing mealworms
Both on ground beef chuck, milk:water, and vitamins, supplementary mealworms			
Band color	28 May	3 June	5 June
Yellow	73.8	66.5	75
Green	71	68	74.5
Self-feeding, mynah meal & milk, supplementary fruits & mealworms			
Band color	1 July	13 July	
Yellow	79.3, fat score 1	77	
Green	80.3, fat score 1	78	

1968), because of the lack of a crop, only a rudimentary caeca, and rapid passage of food through the digestive tract. This may also be true of other non-seedeaters. Mealworms, unless boiled first, are said to be difficult to digest by young nestlings and to cause impaction in some species because of the chitinous (horn-like) material in the worms' outer coats. My copious supply of manure-grown earthworms is somehow distasteful. Not all birds can handle the fat in ground beef.

Is dog burger adequate? To determine this, I color-banded a clutch of four Starlings which had feathers emerging from pins, weighed them, and started them on Gainesburger and a 1:3 combination of skim milk and water plus vitamin drops. Their progress and changes of diet are outlined in Table 3. Dog burger was not adequate for the Starlings. I believe that they needed lipids for synthesis of steroids used in building nerve sheathes, hence the trembling, and the fast recovery of the survivors when given additional fat in the diet.

I had a successful 1977 season feeding American Robin and Barn Swallow fledglings with canned Ken-L-Ration rolled into bits with turkey starter mash. A very young, naked Mockingbird was started on hard-boiled egg yolk dipped in milk, switched to plain Ken-L-Ration, then later fed the bits rolled in turkey starter. All were weaned on Gainesburger and mynah pellets and introduced to

natural food according to species. The Barn Swallow did not regain flight in time to migrate and died, presumably of malnutrition, after frost eliminated the natural moth supply.

The National Research Council (1977) suggests canned dog food as suitable for raising the young of many species. A pabulum and poultry feed diet, or a dog food and beef and mealworm diet has to be chosen according to what the bird eats in the wild. Hickman and Guy (1973) have a chart of natural wild food of bird groups, with their suggested substitutes. The Dover Publication, *American Wildlife and Plants: a guide to wildlife food habits*, is a valuable reference to the natural foods of many species.

Since there is no one answer to food, we foster parents should keep records and make available our results. We need to watch the babies constantly for signs of health: enthusiastic appetite; weight gain; globular white droppings with dark streak, surrounded with fecal sac during younger days. If we offer a variety of foods, the baby learns to gape more vigorously for its preferences and is more likely to get its needs.

Causes of death. Currently diagnosis of wild bird diseases is not certain until necropsy. We foster parents can provide a valuable service by compiling careful records of normal behavior so that the abnormal can be recognized; and by keeping case histories of illnesses so that symptoms can be linked with necropsies. The goal is to recognize illness in time to save the bird.

Dr. David C. Tudor of the Poultry Pathology Laboratory, Rutgers University, kindly did necropsies and bacterial cultures on my birds that died. Results and symptoms are listed in Table 4.

Recent popular guides on wildlife care have chapters on diseases and first aid: Hickman and Guy (1973), Collett and Briggs (1974), Weber (1975), and Koenig and Koenig (1977). Two technical books are edited by Petrak (1969) and Davis et al (1971). The National Research Council compiled a table of common clinical diagnoses of birds from the above mentioned technical books.

In conclusion. Foster parents have the unique opportunity to make studies of substitute diets, to keep careful case histories of illnesses, and to record normal and abnormal behavior of many species of wild birds. A careful record of diseases can contribute a valuable dimension to the explanation of why 80% of songbirds die within the first nine months of life. Meanwhile, considering that wild parents have about a 20% success rate,

Table 4. Diseases, symptoms and laboratory diagnosis

Date obtained & circumstances	Symptoms & diagnoses
28 May 1973, Starling fledgling brought in after storm	29 May, died, respiratory symptoms, no autopsy done
28 May 1973, Starling fledgling brought in after storm	20 June, scratching face, progressive ataxia, emaciation. 25 June, died. Diagnosis: ascarid infestation
5 Aug 1973, Robin fledgling brought in off street	9 Aug, weight loss, 52.5 g to 43 g, died. Diagnosis: paratyphoid (salmonellosis)
7 June 1974, Robin nestling brought in after storm	Sickly, toes turned under, 32 g. On 12 June, 45 g, swallows with difficulty. 14 June, 43 g, pasty droppings, vomited, head drawn back, wings drooped, breathing labored, lay down, went into coma, died. No diagnosis
26 June 1975, grackle fledgling caught by cat, emaciated	27 June died. Diagnosis: nodular tape worms, plasmodium, <i>E. coli</i>
29 April 1977, feral pigeon squab fell from 3rd floor ledge	Canker on neck, inside mouth. Progressive inflammation, inability to swallow, food retained in crop, emaciation, ataxia. 13 May died. Diagnosis: trichomoniasis
23 May 1977 and 23 May 1978, grackle fledglings	Neither could swallow unless head lowered. 1977 bird — feet turned in. 1978 bird — head drifted to one side. Increasing inability to swallow, ataxia, weight loss, death. Diagnosis of 1978: nephritis
12 May 1978, Great Blue Heron, could not fly, emaciated, poor coordination. Euthanized by vet.	Diagnosis: round worm in gizzard, leeches in mouth around base of tongue
23 June 1978, Blue Jay nestling, cat capture. Bite wounds through right shoulder & both sides of breast	Failing, foul smelling pasty yellow feces. 24 June died. Diagnosis: septicemia, liquid in peritoneum, enlarged kidneys, inflamed lungs, fowl cholera (pasturella)
17 July 1978, female Am. Kestrel fledgling, near dog dish in a driveway, could not fly, emaciated	18 July failing, sour smell, food retained in crop. 19 July died. Diagnosis: pericarditis. Lungs, liver, spleen normal. Kidneys pale with crystallized urates.

and we get the casualties, we have truly made an achievement if we approach the same success rate.

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New Conservation Directory

The 24th edition of the Conservation Directory, a comprehensive listing of all organizations, agencies, and officials concerned with natural resource use and management in the U.S. and Canada, has just been published by the National Wildlife Federation.

As the largest such guide in the U.S., the 271-page 1979 Conservation Directory lists the names and addresses of about 1,650 conservation and environmental organizations and more than 11,000 individuals — from the African Wildlife Leadership Foundation to Zero Population Growth, Inc., from the Northeastern Bird Banding Association to the Guam Science Teachers Association.

The directory lists key personnel in federal and state agencies and departments, members of

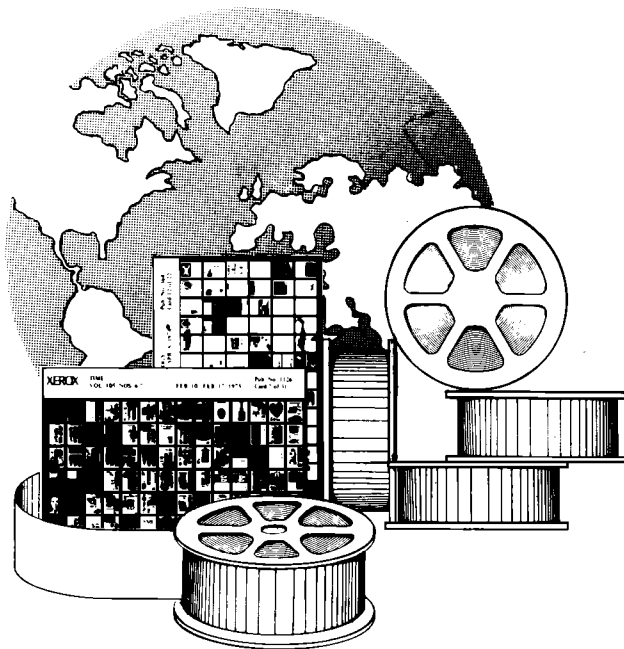
Congress and those Congressional committees concerned with conservation and natural resources; conservation and environmental offices of foreign governments; U.S. and Canadian fish and game administrators; and national, provincial, and territorial citizens' agencies and groups.

There are sections on the major U.S. colleges and universities which offer professional training for careers in conservation and natural resources; wildlife, environmental, and other conservation publications; and sources of audio-visual materials. The annual publication also lists all U.S. National Wildlife Refuges, Forests, Parks, and Seashores.

Copies of the 1979 Conservation Directory are available for \$4.00 from the National Wildlife Federation, 1412 16th St., NW, Washington, DC 20036.

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