

followed another adult male into a tree nearby, begging and fluttering its wings. At 07:48 the female Akepa left the nest and flew to an adjacent ohia tree, where courtship feeding by the male took place.

On 28 May the nest contained 2 young and 1 unhatched egg. The nestlings had pinkish skin and very fine medium grey down on the back of the head, back and wings; the gape was reddish-pink and the corners of the mouth were light yellow; the feet were yellow. We estimated that they were 2–3 days old, which indicated an incubation period of at least 2 weeks.

On 28 May we installed a remote sensor and camera to record activity at the nest. There was some difficulty with the system, but from dawn to dark on 7 June 1976, the female visited the nest 35 times and the male 33 times, to feed the young and remove fecal sacs.

On 6 June the 2 young weighed 9.5 and 10.0 g. Two days later the nest still contained 2 nestlings and 1 egg. By 11 June the nestlings were fully feathered and ready to fledge, and on 14 June they were gone, apparently having fledged. The nest measured 10 cm in outside diameter, 8 cm inside diameter and 3 cm deep. It has been deposited with the National Museum (USNM No. 47307). The body of the nest was constructed primarily of fern rhizomes (probably *Asplenium* spp., *Grammitis hookeri* and various Hymenophyllaceae) and bryophytes (primarily *Thuidium crenulatum*). Additionally, a few fronds from *G. hookeri* were used, as well as shredded leaves of several unidentified sedge and grass species. The lining was composed primarily of grass and sedge (*Uncinia uncinata*) leaves which were for the most part shredded, with smaller amounts of bryophyte (*T. crenulatum*) and some fern rhizomes. A complete list of plants is given in Table 1.

Before discovery of the Akepa nest on Hawaii, only 2 of Hawaii's 37 extant endemic passerine taxa were known to nest in tree cavities: the Kauai Oo (*Moho braccatus*; Sincock, unpubl.) and the Hawaiian Creeper (*Loxops maculatus mana*; Scott, unpubl.). We found several inactive nests in tree cavities in the Kau forest that were apparently those of drepanidids. Since discovery of the Akepa nest, C. van Riper and J. M. Scott (Condor 81:65–71, 1979) have found several tree cavity nests of the Hawaiian Thrush (*Phaeornis o. obscurus*). On 22 March 1978, M. Collins, U.S. Forest Service, found the second known nest of the Hawaii Akepa (Collins, pers. comm.); it was 8 m up an ohia tree, in a cavity. On 11 May 1978, P. Pyle found the third known nest, 6 m up the limb of a fallen Koa (*Acacia koa*), also in a cavity. This nest contained 1 egg.

It remains to be determined whether cavity nesting is characteristic of the Akepa on Hawaii. Cavity nesting in trees suggests artificial nesting structures might be used. We are presently testing several types of artificial nesting structures in Hawaii.

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Longevity of Hawaiian honeycreepers in captivity.—I know of no published records on the longevity of Hawaiian honeycreepers (Drepanididae). I began to raise members of this family in captivity during January 1968. Since that time C. Robert Eddinger, my former

student, and I have kept 5 species in large (1.2 × 1.8 × 2.4 m) cages in our offices at the University of Hawaii: Kauai Amakihi (*Loxops virens stejnegeri*), Hawaii Amakihi (*L. v. virens*), Anianiau (*L. parva*), Kauai Creeper (*L. maculata bairdi*), Nihoa Finch (*Psittirostra cantans ultima* [= *Telespyza ultima* of Banks and Laybourne, Condor 79:343–348, 1977]), and Apapane (*Himatione sanguinea*). All except the Nihoa Finches and 1 Apapane were hand-raised from the nestling stage.

We had little difficulty maintaining most of the species; the general diet used was discussed by Eddinger (Avic. Mag. 77:113–114, 1971) and by Berger (Hawaiian Birdlife, Univ. Press of Hawaii, Honolulu, Hawaii, 1972). The most critical period for hand-raised birds is during the first months of cage life; those that survive this period often live for many years.

Loxops virens stejnegeri.—Eddinger began to hand-raise 4 nestlings on 17 May 1969. One bird died on 1 November 1970 (age 18 months); 2 other birds died on 3 and 5 August 1971, at an age of 26½ months; the fourth bird lived until 8 May 1978 to an age of 9 years.

Loxops v. virens.—I obtained 2 nestlings on 22 January and 2 others on 31 January 1968. One, with a badly deformed leg, learned to stand on 1 leg. However, this bird was never able to fly, and it survived only 3.5 months. The other birds lived for periods of 43, 49 and 56 months.

Loxops parva.—Eddinger obtained 8 nestling Anianiau between 17 May and 23 June 1969. Six of these birds died at ages between 5.5 and 13 months (a veterinarian diagnosed the cause of death as either enteritis or visceral gout). The other 2 birds reached ages of 27 and 42 months, respectively.

Eddinger also took 3 nestling Anianiau on 23 June 1970. One bird died on 4 January 1974, at an age of 4.5 months; a second bird, on 1 August 1977, age 85.5 months. The third bird died on 15 Jan. 1980, age 114.75 months.

Loxops maculata bairdi.—Eddinger found the first nest of the Kauai Creeper with young on 26 April 1970. He collected the nest and 2 nestlings on 20 May. One of these birds died 13 days later, but the second bird lived until 4 July 1972, reaching an age of approximately 26.5 months.

Psittirostra cantans ultima.—John Sincock of the U.S. Fish and Wildlife Service mist-netted 14 Nihoa Finches for me in West Palm Canyon of Nihoa Island on 9 June 1969. These were delivered to me in Honolulu by Eugene Kridler on 11 June. All but 3 of the birds were in immature plumage at that time. My early experiences with these birds are described in Hawaiian Birdlife. Four birds died between 20 June and 15 December 1969. On 9 June 1970, I loaned Jack Throp, Director of the Honolulu Zoo, 2 male Nihoa Finches to place with his 3 remaining female Laysan Finches (*Psittirostra c. cantans*; see Throp, Elepaio 31:31–34, 1970). The 2 Nihoa Finches died on 19 July 1974 (age 61 months) and 17 March 1976 (age 81 months). The remaining 8 birds reached the following ages (in months): 18.5, 25, 25, 71.5, 72, 72.4, 94 and 112.

Himatione sanguinea.—This species proved to be more difficult to maintain in captivity. Eddinger hand-raised 6 nestlings; the longest living ones died at the ages of 16.5 and 19.5 months. However, a bird in adult plumage that was brought to me from the island of Hawaii is still alive 6 years later.—ANDREW J. BERGER, Dept. Zoology, Univ. Hawaii, Honolulu, Hawaii 96822. Accepted 1 Apr. 1979.

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Interspecific nesting of Clay-colored and Field sparrows.—Few records of interspecific breeding between Clay-colored Sparrows (*Spizella pallida*) and congeneric species are known. A hybrid Clay-colored Sparrow × Brewer's Sparrow (*Spizella breweri*) was re-