It appears that the experimental wrens provided with estuarine water and those deprived of water were able to maintain body weight by eating more of the food that was high in water content and less or none of the food that was low in water content. Wrens provided with fresh water were able to consume the drier food. Water content of salt-marsh insects and spiders that are eaten by *T. p. griseus* (Kale, *Oriole*, 29: 47–61) ranges from 55 to 70 per cent of the wet weight, which is similar to that of the meal worms fed in the experiments.

Thus, the Long-billed Marsh Wren in this salt-marsh habitat, apparently follows the ecological pattern of water economy which is characteristic of insectivorous birds living in arid regions, i.e., that of obtaining all the water needed from highly succulent food (Bartholomew and Cade, *op. cit.*: 526).

I thank Eugene P. Odum under whose guidance this study was conducted, and George A. Bartholomew who read this manuscript. I am especially indebted to George Bernard who examined and described the nasal glands of the wrens. This paper is Contribution No. 137 of the University of Georgia Marine Institute, Sapelo Island, Georgia. This research was supported by funds of the Sapelo Island Research Foundation, NSF Grant G-19388, an NIH pre-doctoral fellowship (GPM-16,190), and a grant from the Frank M. Chapman Memorial Fund administered by the American Museum of Natural History.—HERBERT W. KALE, II, *Entomological Research Center, P. O. Box 308, Vero Beach, Florida.*

Records of four species of *Pterodroma* from the central Pacific Ocean.—The Pacific Ocean Biological Survey Program of the Smithsonian Institution is currently conducting ornithological investigations in the central Pacific Ocean. This paper summarizes specimen and observational data obtained by this program on four relatively little-known members of the procellariiform genus *Pterodroma*: Murphy's Petrel (*P. ultima*), Tahiti Petrel (*P. rostrata*), Kermadec Petrel (*P. neglecta*), and South Trinidad Petrel (*P. arminjoniana*). Observations and collections made between August, 1963, and March, 1967, in the 3.33-million square mile area between 0° and 25° North latitude and 148° West and 175° East longitude are covered. Specimens reported here are in the collection of the U. S. National Museum.

Pterodroma ultima.—A female (USNM 492988) was taken by James Ludwig on Green Island, Kure Atoll, Leeward Hawaiian Islands, on 7 October 1963. It weighed 405.2 g; the largest follicle measured 2 mm. The bird was noted in the morning, flying low over the vegetation and calling. A female (USNM 497224) was taken by Brian Harrington on Tern Island, French Frigate Shoals, Leeward Hawaiian Islands, on 9 September 1966. The ovary measured 20 × 4 mm; the largest ovum measured 4 mm. The bird landed several times on the island before it was collected.

This species had not been collected previously away from its breeding grounds in the Austral and southern Tuamotu islands. Possible confusion with similar species, such as dark-phased Kermadec or South Trinidad petrels, makes identification at a distance often unreliable. Few individuals of this or similar species were seen in the north-central Pacific. These birds were probably stragglers outside their normal range.

Pterodroma rostrata rostrata.—On 21 November 1964, Kenneth Amerman took a female (USNM 494097), at sea at 3°50′N, 178°09′W. It weighed 307 g and the ovary measured 7 × 4 mm. Six other individuals resembling this species were observed on the same day. A male (USNM 495269) was taken at sea by Dayle Husted at 6°21′N, 156°04′W on 11 June 1965. It weighed 451 g; the testes measured 6 × 5 and 9 × 7 mm. The bird was flying with a similar bird and 10 other individuals

resembling this species were observed on the same day. On 10 April 1966, James Lewis took a female at night at 00°20'S, 177°46'W. It weighed 344 g; the testes measured 3 × 2 mm. All three specimens are referable to this eastern subspecies which is at least 15 per cent larger than the western subspecies (*P. rostrata becki*) in its dimensions (R. C. Murphy, *Amer. Mus. Novit.*, 1580: 20–22, 1952).

This species breeds on islands of the Marquesas, Society, and New Caledonia groups. Its status away from these islands is relatively little known (*ibid.*). Sightings have been made in July and September between the Fiji Islands and Australia (A. Y. Norris *in* W. R. P. Bourne, *Sea Swallow*, 17: 23, 1965), and one specimen has been recorded from Formosa (Ornithological Society of Japan, *A handlist of the Japanese birds*, third edit., Tokyo Imperial University, 1942). The similarity between this species and the Phoenix Petrel (*P. alba*), which breeds in several tropical and subtropical South Pacific island groups, prevents reliable identification at sea.

These three specimens, plus a number of sight records of either this species or Phoenix Petrel, indicate that the Tahiti Petrel is at least an occasional visitor to the north-central Pacific Ocean.

Pterodroma neglecta.—Kenneth Amerman collected a male (USNM 494098) at sea at 13°54'N, 168°21'W on 25 November 1964. It weighed 328 g and its left testis measured 4 × 1 mm. On 5 July 1965 Lawrence Huber obtained a male (USNM 495270) at sea at 9°N, 155°W, weighing 412 g (testes 4 × 1 and 5 × 1 mm). Richard Crossin collected a third male at sea on 7 November 1966, at 15°54'N, 167°17'W. It weighed 335 g; its left testis measured 3 × 1 mm. All three specimens fall within the range of overlap in the dimensions of the subspecies *P. neglecta neglecta* and *P. n. juana* (see Murphy, *op. cit.*: 8–9, 25–32), and thus cannot be assigned to either.

This species is a transequatorial migrant ranging north as far as 21° North latitude in the eastern Pacific and 28° North latitude in the central Pacific, where it is a regular nonbreeding visitor. It breeds across the south Pacific Ocean between 25° and 35° South latitude from the Juan Fernandez Islands to Lord Howe Island. Our knowledge of its breeding schedule is fragmentary and confusing. On Mas a Tierra, Juan Fernandez Islands, R. H. Beck (see R. C. Murphy, *Oceanic birds of South America*, New York, American Museum of Natural History, 1936; p. 706) recorded eggs as common from 15 December through 17 January 1913–14. On Raoul Island, Kermadec group, eggs were present from late October through early December in 1908 (W. R. B. Oliver, *New Zealand birds*, second edit., Wellington, A. H. and A. W. Reed, 1955; see p. 158), but none were found in November, 1964 (A. T. Edgar, F. C. Kinsky, and G. R. Williams, *Notornis*, 12: 33, 1965). On Meyer Island, also of the Kermadec group, eggs were recorded from late February through mid-April in 1908 (Oliver, *loc. cit.*). In August, 1944, downy chicks, large fledglings, and one incubating bird were recorded from Meyer Island (J. H. Sorensen, *Notornis*, 11: 72, 1964).

The pelagic distribution is also poorly known. One specimen was taken by Beck in July, 1897, at 21°10'N, 115°38'W (Murphy, 1952, *supra*: 32), and assigned by Murphy to the eastern Pacific breeding population, *P. n. juana*. Beck obtained two more in October, 1906, at 14°24'N, 107°05'W and 15°40'N, 110°12'W (L. M. Loomis, *Proc. California Acad. Sci.*, ser. 4, 2: 103, 1918). Possibly these birds also represent the eastern Pacific breeding population. W. Bruyns (*Sea Swallow*, 17: 62, 1965) recorded two sightings in November, 1960, at 6°30'N, 115°00'W in the same general area. Far to the northwest, A. Wetmore (pers. comm.) secured a male (USNM

TABLE 1

SIGHT RECORDS OF *PTERODROMA NEGLECTA* FROM AUGUST, 1963, THROUGH MARCH, 1967, IN THE CENTRAL PACIFIC OCEAN

Month	*Number of dark-phased birds (questionable identification)*	*Number of light-phased birds*	*Days of observation*[1]	*Light-phased birds/day*
January	12	34	68	.50
February	1	2	63	.03
March	0	2	96	.02
April	1	2	88	.02
May	7	2	97	.02
June	12	1	84	.01
July	3	4	74	.05
August	5	1	52	.02
September	13	5	84	.06
October	10	5	106	.05
November	17	12	85	.14
December	7	11	74	.15

[1] Each day represents over 10 hours of observation from sunrise to sunset.

300679) on Kure Atoll, Leeward Hawaiian Islands, in April, 1923. This specimen is previously unreported. Its measurements fall in the area of overlap between the two subspecies.

Dark-phased birds may be confused with Solander's Petrel (*P. solandri*) or Murphy's Petrel (*P. ultima*). Light-phased individuals are more distinct, but may sometimes be confused with the South Trinidad Petrel (*P. arminjoniana*). Therefore, sight records of light-phased birds are thought to be somewhat more reliable.

In the north-central Pacific our party observed a total of 81 light-phased individuals and 88 dark-phased birds (of more questionable identity). Birds were observed in every month (Table 1). The spatial distribution of all of these sightings appears to have been random in the area covered. There was, however, a definite seasonal peak in the abundance of these petrels from November through January. The relatively large numbers found in January suggest that the birds were moving from more northerly latitudes toward their breeding grounds, thus supplementing the numbers recorded at other times. A peak in numbers in January would be consistent with the breeding cycle suggested by Oliver (*ibid.*) for the birds on Meyer Island of the Kermadec group and lends credence to the theory that the birds in the north-central Pacific represent mainly the western Pacific breeding population.

Pterodroma arminjoniana heraldica.—Dayle Husted obtained a male (USNM 497098) at sea at 1°28'N, 175°48'W on 1 December 1965. It weighed 283.5 g; its left testis measured 4 × 2 mm. A female (USNM 497177) was collected at sea on 15 November 1966, at 07°45'N, 178°28'E by Lawrence Huber. It weighed 257 g; its ovary measured 7 × 5 mm.

The first specimen may be assigned safely to *P. a. heraldica* since its dimensions fall within the range of this subspecies, but well below those for *P. a. arminjoniana,* as given in Murphy (1952, *supra*: 8–9, 35–41). The subspecies determination of the second specimen is in doubt since its tail measurement exceeds those listed by Murphy (*ibid.*: 8–9) for either subspecies by several millimeters. In other measurements it conforms with *P. a. heraldica.*

Herald petrels, by which the Pacific Ocean race of *P. arminjoniana* is known, breed across the subtropical South Pacific from Easter Island to the Chesterfield Islands. Its breeding season is of extended length and may be continuous (*ibid.*: 35–41). Its occurrence north of the Equator in the Pacific was previously unconfirmed, although birds of the subspecies *P. a. arminjoniana* have been taken in the Northern Hemisphere in the Atlantic Ocean, and sightings have been reported from north of the Equator in the Indian Ocean (W. R. P. Bourne *in* R. S. Palmer [ed.], *Handbook of North American birds,* vol. 1, New Haven, Yale Univ. Press, p. 213, 1962).

Infrequent sightings of the Herald petrel at sea by our party indicate it is a rare but fairly regular nonbreeding visitor to the north-central Pacific Ocean.

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We are grateful to Dr. George E. Watson for critically reviewing a draft of this manuscript. We thank also the many members of the POBSP who contributed observations, and particularly Dr. Charles A. Ely who compiled records included in this report, which is Paper Number 4, Pacific Ocean Biological Survey Program.—PATRICK J. GOULD and WARREN B. KING, *Smithsonian Institution, Washington, D. C.*

***Agapornis fischeri*, *Lybius guifsobalito*, and *Stiphrornis erythrothorax* in Kenya.**—Several recently secured bird specimens represent additions to the known avifauna of Kenya. Unless otherwise stated, the skins referred to below are in the collection at Western New Mexico University.

Fischer's Lovebird (*Agapornis fischeri*).—On 27 December 1965, Mr. Robin D. Seed of Nanyuki collected a male near Isiolo in Kenya's Northern Frontier District. This species normally ranges no nearer than northern Tanzania and, to my knowledge, has never been taken north of that country. In conversation, Mr. Seed informed me that the bird obtained was 1 of 8 or 10 in "lush acacia woodland" within a few miles of Isiolo; the birds were difficult to approach and obviously wild. The specimen secured is in unworn plumage, and there is nothing to indicate recent captivity. This, plus the wary behavior of the birds and their presence in a remote area, suggests a natural occurrence. It is of course possible that the Isiolo individuals represent descendents of once-captive birds from elsewhere. Fischer's Lovebirds have been, and doubtless still are, trapped in numbers in Tanzania for cage-bird traffic. Some of these undoubtedly escape and perhaps breed far from their point of capture. However, except for some semi-wild individuals often seen on the grounds of the Lake Hotel at Naivasha, no birds that were obviously escapees have been reported from Kenya.

Black-billed Barbet (*Lybius guifsobalito*).—C. W. Mackworth-Praed and C. H. B. Grant (*Birds of eastern and north eastern Africa,* vol. 1, London, Longmans, Green and Co., 1957; see p. 703) give the range of the Black-billed Barbet in eastern Africa as "Eritrea and Abyssinia to Sudan and central and western Uganda." Evidence of an eastward spread of the species is indicated by three specimens from Kenya. An adult female with a slightly enlarged ovary was collected at 5,000 feet elevation, 30 miles east of Tororo in western Kenya, 23 May 1965, by A. E. Williams; the specimen is in the Kenya National Museum, Nairobi. An adult female was collected near Endebess, Kenya, 15 miles south of Kitale, also on 23 May 1965, by R. W. Hissey; and an adult male was taken in April, 1966, at 6,400 feet on Mt. Elgon near Endebess by P. J. Kelly. This last specimen was crudely prepared and later given to Mr. Seed who presented it to me. It is now in the American Museum of