GENERAL NOTES

Feather replacement in the macaroni penguin, *Eudyptes chrysolophus* (Brandt).[1]—A number of years ago Lowe (Proc. Zool. Soc. London, 1933: 498–502) described the highly peculiar condition attendant upon molt in the jackass penguin, *Spheniscus magellanicus*. His dissection of one of these birds revealed a closely packed mass of nearly fully grown new feathers lying in the subcutaneous tissues, enclosed in long, slightly flattened, narrow cylinders, inclined at a distinct angle to both the under surface of the cutis and the bases of the old feathers. The extent to which these new feathers had developed subcutaneously accounted for their length and for the fact that when Lowe slit one of the follicular sheaths, the enclosed feather was found to be fully-formed, with characteristic terminal and lateral fraying into barbs and barbules. He writes that the usual involution of the Malpighian layer and of the stratum corneum of the epidermis is carried to a high degree of specialization in the jackass penguin, so that the crypt is long enough (20 mm.) and its walls thick enough to contain an almost fully-grown feather. "In addition, the follicular sheath assumes in the subcutaneous tissues such a separate or discrete existence as to place it almost on the level of a distinct organ . . . The crypts or follicles are packed close together, . . . separated by loose fat-laden areolar tissue, blood vessels, and nerves. The outside of each follicle has a highly polished, smooth, and corneous appearance, its base rests on the fascia covering the muscles, and its mouth opens in the usual way on the superficial surface of the epidermis and is in continuity with the epitrichial layer of the epidermis . . ."

At the time of his observations, Lowe seems to have assumed this condition to be unique in birds and he hardly dared even to ask if it might be characteristic of the penguins as a group and not merely of a single species in the group. However, there was earlier evidence, which must have been known to Lowe (as the papers in which the facts are recorded are listed by him) indicating that a similar state of affairs prevailed in the king penguin, *Aptenodytes patagonica*, and apparently also in Humboldt's penguin, *Spheniscus humboldti*. Seth-Smith (Proc. Zool. Soc. London, 1912: 60–62) found that in the king penguin the new plumage, " . . . was apparently fully grown before the old feathers were shed, this giving rise to the very puffed out appearance of the bird just before the actual feather shedding commenced . . . " He figures several feathers which show that the sheath of the new feather is attached to the end of the shaft of the old one. Bartlett (Proc. Zool. Soc. London, 1879: 6–9) noted that in Humboldt's penguin, " . . . the old feathers were pushed off by the new ones . . . the bird was entirely covered with its new plumage before the old feathers dropped off . . . "

Recently, evidence has come to light that shows that still another species (and genus) of the family exhibits this unusual mode of feather replacement, which is probably found in penguins generally. Lowe and others, have intimated that this is hinted at by the peculiar shedding of blocks of feathers *en masse* in many of the species.

Two specimens of the macaroni penguin, *Eudyptes chrysolophus*, were received in the flesh at the United States National Museum, and were skinned by Mrs. Roxie C. Simpson, taxidermist of the United States Fish and Wildlife Service. Unfortunately, she did not show them to me at the time but later told me that she was amazed to

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find that they had, as she put it, "almost as many feathers on the inside of the skin as on the outside." What she saw undoubtedly was the mass of new feathers which were freed from their sheaths as a result of her scraping away the fatty areolar subcutaneous tissue and had expanded their otherwise curled up webs. Fortunately, Mrs. Simpson saved some of the feathers that were lost in the process of skinning, and these I have examined with a magnifying glass. Attached to their bases in most cases are new feathers from five to 12 millimeters long and tightly curled up in their follicular sheaths. On slitting some of these open it was easy to see the nearly formed, typical, feathery structure within.

It follows from this that in at least three genera of penguins (*Spheniscus*, *Aptenodytes*, and *Eudyptes*) the new feathers are well developed before the old ones are shed, and that the new ones actually push out their predecessors, whereas in practically all other birds the new feathers supposedly begin to develop when the old ones are dropped. According to Stresemann (Handbuch der Zoologie, VII, Vögel, 1927: 32) the new feathers develop prior to the shedding of the old ones not only in penguins but also in cassowaries; they are not known to do so in any other group of birds.—HERBERT FRIEDMANN, *United States National Museum, Washington, D. C.*

Extension of range of the ringed penguin.—While I was a member of the U. S. Navy Second Antarctic Development Project, 1947–1948, it was my privilege to participate in a landing upon Peter I Island, Antarctica, located at 68° 50′ S., 90° 30′ W. We landed from the U. S. S. Edisto on February 15, 1948. Peter I Island is about fourteen miles long in a north–south direction and about five miles wide. It was entirely covered with snow except for the bare rock slopes. Lars Christensen Peak, a lofty rounded peak of an extinct crater about 3,937 feet high, is the greatest elevation. Our landing was made at Framnes Head, at the head of Sandefjord Bay. It is a steep, rugged platform of lava and basaltic rock about 250 feet long and 130 feet broad upon which a provision depot was established by Norway five days before our arrival. Near the cache of gear left by the Norwegians was a small rookery of Adelie penguins (*Pygoscelis adelie*). The Adelie has been recorded for Peter I Island and is more or less abundant in its immediate vicinity, but mixed with *Pygoscelis adelie* were two ringed penguins (*Pygoscelis antarctica*), which I collected as live specimens for The National Zoological Park. These two specimens did not appear to have been breeding, as were the Adelies which were in the last phase of the breeding cycle.

A search of the literature reveals that Peter I Island is a new locality for the ringed penguin (*Pygoscelis antarctica*). Murphy (Oceanic Birds of South America, 1: 407, 1936) states that the species does not range beyond the islands off the west coast of the Antarctic Archipelago and that it is resident on practically all islands of the American quadrant, from latitudes close to the Antarctic circle northward to the Falklands. The South Orkneys and the South Sandwich groups are its principal centers of abundance. South Georgia has never been more than a foothold for the species, and from the Falkland Islands it is recorded only as a straggler. *Pygoscelis antarctica* is not known to the continental coasts of South America.

Therefore, I report Peter I Island as a new range for *Pygoscelis antarctica.*

In captivity the ringed penguin is obstinate, stubborn, unintelligent, pugnacious, disagreeable, and above all a poor feeder, thus making the bird a poor zoo specimen. Its relatives will take food after a forced-feed period of about 30 days, but *antarctica* seemingly does not adjust itself to life in captivity. The result is that the bird has been displayed only twice, for the long trip from the south polar regions has proven