Swinhoe's Storm-Petrel

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On August 8, 1998, the authors were participating in a pelagic birding trip off Hatteras, North Carolina, aboard the *Miss Hatteras* with Captain Spurgeon Stowe and 29 passengers. Winds were light from the southeast and seas calm. Over most of the previous week, strong northeasterly winds had created a strong current that apparently pushed the Gulf Stream much farther offshore than usual and brought cool water well south of Cape Hatteras. Indeed we did not run into warm water until 54 km out, about 16 km farther seaward than usual, but when we arrived at the Gulf Stream's western wall, the seabirds were numerous. By early afternoon, the waters southeast of Hatteras had proven highly productive, with studies of Herald (Trinidade) Petrel *(Pterodroma [a.] arminjoniana)* and South Polar Skua *(Catharacta maccormicki),* large concentrations of shearwaters (*Calonectris diomedea* and *Puffinus* spp.) and Black-capped Petrels *(P. hasitata),* and a record count of Band-rumped Storm-Petrels *(O. castro)* for that port.

At about 15:15 EDST, shortly after we started to head back shoreward, we flushed a small group of *Oceanodroma* storm-petrels off the water, including one with entirely dark uppertail coverts and rump. Given the recent spate of Swinhoe's Storm-Petrel records in the northeastern North Atlantic (Bretagnolle et al. 1991, Cubitt 1995) and a sight record from North Carolina waters (Brinkley 1995), together with the fact that dark-rumped Leach's Storm-Petrels *(O. leucorhoa)* have yet to be documented in the Atlantic Ocean basin (see below), we suspected the bird might be a Swinhoe's. We pursued the bird to the southwest for about 11 km over a 40-45 minute period in an attempt to obtain photographs and better views. The bird remained in flight for the entire observation, but Captain Stowe occasionally brought us to within about 25 meters of the bird, allowing reasonably good views. During this time, we obtained about 150 photographs of the bird and noted a combination of plumage, structural, and flight characters that confirmed the identification as Swinhoe's Storm-Petrel. On several occasions we flushed other storm-petrels and, for brief periods, had Wilson's *(Oceanites oceanicus),* Leach's, and Band-rumped storm-petrels flying alongside the Swinhoe's for direct comparison.

The bird was initially found at 34°37′05″ N, 75°18′30″ W, about 68.6 km south-southeast of Hatteras Inlet, in water 2378 meters deep, and was pursued to 34°32′00″ N, 75°25′45″ W, about 77.8 km south-southeast of Hatteras Inlet, in water 2378 m deep. Sea surface temperature in these waters ranged from 28.8 to 29.2° C. For most of the observation, distances from the bird ranged from about 50 to 75 m. Lighting conditions ranged from good off the port bow to harsh and backlit off the starboard bow, but Captain Stowe was able to keep the bird in good light most of the time.

DESCRIPTION

Size, Structure, and Molt. The bird most closely resembled a Leach's Storm-Petrel. It was of roughly the same length as a Leach's or Band-rumped but often gave the impression of being slightly larger than either. Its wings were relatively long with an obvious bend at the carpal joint or "wrist." It appeared proportionally longer-winged than either Band-rumped or Leach's and seemed to hold its wings in a relatively outstretched position, much more akin to Band-rumped than Leach's. Compared to Leach's, the wings were narrower in the "arms" but longer and broader in the "hands" and were not so sharply pointed at the tips (Figures 1, 2, 3). The net effect was of more wing area in proportion to the body than on a Leach's or Band-rumped and, when the primaries were spread, the wings looked almost paddle-shaped, very unlike Leach's or Band-rumped. In photographs of the Swinhoe's with a Band-rumped (Figure 4), the Swinhoe's appears remarkably slimmer-bodied, which suggests that the field impression of larger size in the Swinhoe's was at least partially artifactual, probably owing to greater overall wing area. None of us ever had a firm impression of tail shape in the field, but photographs seem to show a tail that is slimmer than that of a Leach's and with a shallower notch (Figures 1 and 2). Although the slim tail gave the bird a long-tailed look in direct flight (Figure 5), when the rectrices and primaries were spread and the full wing area revealed, the bird actually looked quite short-tailed (Figure 1). The flight feathers looked full, with no obviously missing feathers, though in some photographs (Figures 1 and 5) the outer primaries look more worn than the inners, suggesting that the bird was midway through primary molt. Judging from photographs (Figures 6, 7, and 8), the primary coverts seem to be full as well. For additional images of this individual, consult Patteson's website at http://www.patteson.com

Coloration. The overall color was dark grayish-brown, darkest on the uppertail coverts and rump and slightly paler on the upper back and nape. The tone was similar to that of a Leach's but obviously paler than that of a Band-rumped. In photographs, the head appears to be contrastingly grayer (Figures 8 and 9), though this was not noted in the field. The pale upperwing covert bar or "carpal bar" was very obvious, as on a Leach's, and it broadened markedly toward the leading edge, as on that species (Figures 2, 5, 6, and 8). From above, the outer several primaries appeared to have some white toward their bases, though it was very inconspicuous and only visible when the bird was at its very closest (about 25 m). We had this impression especially as the bird banked, perhaps because it spread the primaries farther apart but no doubt also because the wing motion was slowest then. Had we not looked specifically for white in the primaries, it probably would have gone unnoticed. Photographs confirm that there is a very restricted white patch at the base of the outer primaries, visible in both spread and folded wing positions (Figures

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Michael O'Brien Figure 1

Michael O'Brien Figure 2

J. Brian Patteson Figure 3

J. Brian Patteson Figure 4

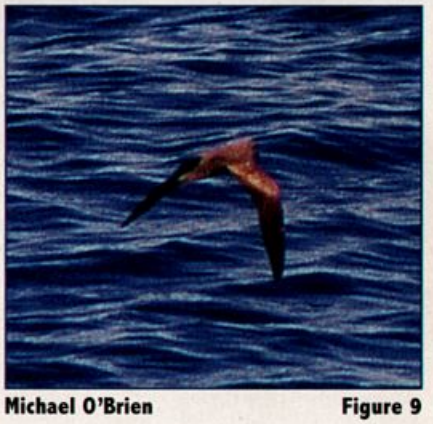
J. Brian Patteson Figure 5

Michael O'Brien Figure 6

George L. Armistead Figure 7

George L. Armistead Figure 8

Figures 1 to 9. In these photographs, most of the general proportions and plumage characters of this Swinhoe's Storm-Petrel can be discerned. Figures 1, 2, and 3 show the overall shape of the body and wings fairly well: the base of the wing appears a bit narrower than in Leach's, whereas the primary area looks a bit broader in comparison. In Figure 4, where Swinhoe's is pictured with a Band-rumped, the former looks somewhat slimmer of body, perhaps owing to the impression of greater wing area. Impressions of tail length varied from long (Figure 5) to rather short when the wings were extended (Figure 1). Figures 6, 7, and 8 show a bird with intact, full primary coverts, though Figures 1 and 5 suggest that the outer primaries are more worn than the inner (possibly newer) primaries. The dorsal surface of the bird was largely flat brown, set off by a pale carpal bar (Figures 2, 5, 6, and 8). Otherwise, the only pale pigmentation on the bird consisted of a patch at the visible base of the primaries (Figures 6, 8, and 9).



Michael O'Brien Figure 9

6, 8, and 9). Whether this white patch is confined to the primary shafts or includes webbing is not possible to determine.

Flight Style. The flight style seemed distinct from both Leach's and Band-rumped storm-petrels. The wing strokes were relatively slow and "loping" (not snappy) and the flight was quite steady and direct, not unlike that of a tern. It lacked the nighthawk-like erratic bounding, quick direction changes, and side-to-side rocking of Leach's or at least these patterns were very much reduced from those of Leach's. Though the wing strokes were deep, they were shallower than those of Leach's, not rising as high on the upstroke and seldom exhibiting the deep "V" so typical of that species. The glides were on bowed wings as in Leach's and Band-rumped, but the glides were longer than those of Leach's (usually one-two seconds). Compared to Band-rumped, the wing strokes were deeper and slower and the glides probably averaged shorter. How much the bird's flight patterns were influenced by pursuit is not known, but one would expect a bird to move faster and more directly while being chased. We do, however, often chase Leach's and Band-rumped storm-petrels on pelagic trips and have never seen one exhibit a similar flight style. We should note also that, after following the bird for a while, it gradually shifted to longer glides and shorter periods of flapping, increasing its distinction from Leach's.

STATUS AND DISTRIBUTION

Swinhoe's Storm-Petrels occur primarily in the western Pacific and northern Indian Oceans. Breeding takes place on islands off Russia, Japan, Korea, China, and Taiwan, with egg-laying between May and August (James & Robertson 1985). These birds migrate south and west through South China Sea and at least some travel as far as the northern Indian Ocean and Red Sea (Harrison 1987).

The first fully documented record of Swinhoe's Storm-Petrel from the Atlantic Ocean came in June and July 1983, when a bird was tape recorded and later captured in the nest chamber of a Band-rumped Storm-Petrel on Great Salvage Island, Madeira (James & Robertson 1985, Cubitt et al. 1992). Prior to that, there was an intriguing record from 1829 of a small dark storm-petrel type with a forked tail captured at the same location (Heineken 1829), a bird that may have been a Swinhoe's. Since 1983, at least eight more Swinhoe's Storm-Petrels have been captured under similar circumstances at the Salvages and in France (Bretagnolle et al. 1991), England (Bretagnolle et al. 1991), Norway (Gantlett 1997 & 1998a), and Portugal (Gantlett 1998b). Amazingly, one individual at Tynemouth, England was captured eight times between 1990 and 1994 (Cubit 1995). Additionally, there have been two captures in the Mediterranean in Spain (King & Minguez 1994) and Italy (Gantlett 1997). Along with these captures, there have been a number of sightings at sea or from land-based seawatches in Europe of dark-rumped storm-petrels, most of which are now presumed to be Swinhoe's (Bretagnolle et al. 1991, Bourne 1992, Morrison 1998). The most famous of these is the "*Chalice* petrel" seen August 3, 1988, off Cornwall, England (Gantlett 1988), the identification of which has been hotly debated over the past decade (e. g., Bourne 1997, Hume 1997, Young and King 1997, Force 1997).

How Swinhoe's Storm-Petrels arrive in the Atlantic Ocean is unknown. It is plausible that they either pass around the Cape of Good Hope and north into the Atlantic or arrive from the northern Indian Ocean via the Red and Mediterranean Seas (James & Robertson 1985). The records from the Mediterranean off Italy and Spain and one from Eilat, Israel (King & Minguez 1994) lend credence to the latter theory.

However they arrive in the Atlantic, the intriguing question remains as to whether these Atlantic Swinhoe's are breeding. It has been suggested that a small breeding population of Swinhoe's may exist somewhere in the northeastern Atlantic (Cubitt et al. 1992), but as yet none has been discovered. Interestingly, of the birds that have been captured, several have possessed vascularized brood patches, which would appear to lend more weight to suspicion of local breeding (Parkin & Cubitt 1995). Also, an apparent morphometric divergence exists between Atlantic and Pacific Swinhoe's Storm-Petrels, with the Atlantic birds showing larger wing chord measurements (Cubitt et al. 1992), though, as Cubitt (1995) notes, this conceivably could be explained by differences in the recorders and/or their measuring techniques. DNA analysis has found Atlantic Swinhoe's to be genetically inseparable from Pacific birds (Dawson 1992), which suggests that they are relatively recent visitants from the core population, perhaps prospecting new nesting areas, and that Atlantic Swinhoe's probably have not been long isolated from Pacific populations.

IDENTIFICATION

Although Leach's Storm-Petrel is clearly the most similar species to Swinhoe's and, in fact, the two have been considered conspecific in the past (Huntington et al. 1996), a whole suite of species must be considered in determining the identity of the North Carolina bird. There are eight all-dark storm-petrels within the genus *Oceanodroma,* including Matsudaira's *(O. matsudairae),* Leach's, Markham's *(O markhami),* Tristram's *(O. tristrami),* Swinhoe's, Ashy *(O. homochroa),* Black *(O. melania),* and Least *(O. microsoma).* All share wholly dark plumage (with the exception of those subspecies of Leach's that show a variable white rump patch) and a variably prominent pale upperwing bar. Bulwer's Petrel *(Bulweria bulwerii)* is similar enough to warrant consideration as well, but this species and Least Storm-Petrel (in addition to pronounced differences in proportions from Swinhoe's) both have wedge-shaped tails that should easily rule them out.

Having had the advantage of watching the North Carolina bird side-by-side with Leach's, Band-rumped, and Wilson's storm-petrels, we were able to get a good feel for its relative size and proportions In direct comparison, the bird was not obviously different in size from Leach's, though it had at least the illusion of being fractionally larger and longer-winged, perhaps owing to its apparently greater "hand" area and to its tendency to hold its wings more outstretched than Leach's. There is clearly a margin of error in making estimates of size in the field. Many factors such as flight style, wing shape, and overall proportions can influence the apparent size of a bird in the field, and of course each species exhibits a range of measurements. However, under the conditions of this observation, size alone provided a solid means of ruling out all but Leach's and Swinhoe's. Even at a glance, a Matsudaira's, Markham's, Tristram's, or Black storm-petrel should appear obviously larger than Leach's in the field and Ashy obviously smaller, particularly to experienced seabirders familiar with most of the eastern North Pacific species. Using average wing chord measurements (in Cubitt et al. 1992) as a gauge of apparent size, Black and Markham's should each be 12 percent larger than nominate Leach's, Tristram's 14 percent larger, Matsudaira's 19 percent larger, and Ashy 12 percent smaller.

To put the usefulness of relative size in perspective, we'll use the example of Leach's vs. Wilson's storm-petrels, two species we see together frequently off North Carolina. Although there are times when the larger size of a Leach's is less than obvious, particularly when views are brief or distant, in prolonged study, the size difference is always readily apparent if not striking. From wingspan measurements in Harrison (1987), Leach's Storm-Petrel should appear

about 13 percent larger than Wilson's, and we feel that any size difference of even half that magnitude would have been readily discernible in the prolonged views we had, which included side-by-side comparison with Leach's, Band-rumped, and Wilson's.

Tail shape is another feature that rules out all but Leach's or Swinhoe's and strongly suggests Swinhoe's. Matsudaira's, Markham's, Tristram's, Black, and Ashy all show obvious deeply forked tails. In Leach's, the tail fork is shallower and sometimes hard to see in the field The tail fork of Swinhoe's has been described as shallower than that of Leach's by King and Minguez (1994) and difficult to see by Enticott and Tipling (1997), and Peter Hayman's excellent drawing in Cubitt (1995) shows a tail fork of about half as deep as that of a Leach's. The North Carolina bird's tail appeared to be more shallowly notched than that of a Leach's (Figures 1 and 2) and clearly not consistent with the deeply notched tails of any of the dark-rumped storm-petrels other than Leach's or Swinhoe's.

Within the genus *Oceanodroma,* the presence of white primary shafts beyond the coverts has been widely cited as limited to Matsudaira's and Swinhoe's storm-petrels (e. g., Cubitt 1995). Though it was difficult to see in the field, photographs of the North Carolina bird show distinct whitish patches at the base of the outer primaries, evidently the result of white-based primary shafts (Figures 6, 8, and 9). However, David Sibley (in an internet posting to the group BIRD-WG01 [Frontiers of Field Identification], 1 Dec. 1998) points out that some Black and Leach's storm-petrels (perhaps five percent) can show white primary shafts, occasionally forming an obvious patch visible at a distance. Indeed, white-based primary shafts are visible in published photographs of Black and Tristram's storm-petrels in Enticott and Tipling (1997), and at least a suggestion of white-based primary shafts is visible in photographs of Band-rumped (the English common named used in this text is "Madeiran Petrel") and Markham's storm-petrels in Harrison (1987). Also, a specimen of Markham's collected off Peru has whitish primary shafts (M. Force, unpub. ms.). Despite this cautionary note, specimens show that visible white primary shafts beyond the primary coverts are typical of Swinhoe's but rare at best in Leach's. We examined 41 Leach's specimens (including 22 *beali,* 13 *leucorhoa,* three *socorroensis,* and three of unknown subspecies) at the Academy of Natural Sciences and found that none showed primary shafts that were white or even slightly pale beyond the primary coverts. Although the very bases of these primary shafts are indeed whitish, they shade quickly to grayish, then brown, and the primary coverts extend 5 to 7 mm beyond any pale coloration. Clearly then, although a trace of white at the base of the primaries, especially when seen poorly, should not be considered diagnostic for any storm-petrel, it is certainly more typical of Swinhoe's than Leach's. It is important to note that on the North Carolina bird, the primary coverts were full (Figures 6, 7, and 8), so the bases of the primaries were not more exposed than usual. It should also be borne in mind that intense lighting at sea can often create the illusion of pale primary shafts. We have had this fleeting impression of pale or whitish primary shafts in many tubenoses at sea but, most importantly, in species that show no pale primary shafts in the museum tray or in photographs. We believe that the discrete white patches visible at the base of the primaries in photographs of the North Carolina bird (Figures 6, 8, and 9), differ substantially from the illusion of white shafts created by transient effects of light. Under other circumstances, wear or molt in greater upperprimary coverts exposes the pale bases of the primary shafts (in many seabird species), or the worn (and therefore paler, in a dark seabird) inner webs of the primaries can be, very easily, mistaken for the shaft of the primary itself Finally, seabirds that have patches of leucistic feathering *may* have a tendency to have partially amelanistic primary shafts

The feature that initially brought our attention to this bird was its entirely, unambiguously dark rump. Whether nominate Leach's can show an entirely dark rump is a matter of some debate but, to date, no such bird has been documented. The authors have collectively seen hundreds of Leach's Storm-Petrels in the North Atlantic showing a wide range of rump patterns. Not a few examples have shown completely white rumps with no apparent dark central division, whereas at least one individual off Oregon Inlet, North Carolina in July 1991 showed little more than pale grayish-white outer fringes to the rump (M. O'Brien, pers. obs.). The latter individual indeed looked dark-rumped at first and generated quite a stir on the boat until better views were had. With this degree of variation in the rump pattern of nominate Leach's, it would not be surprising to find an example with a completely dark rump. Bourne and Simmons (1997) document the occurrence of a single "dark-rumped" Leach's Storm-Petrel in the South Atlantic, but their basis for this claim is a 1964 specimen from southeast of St. Helena that actually shows patches of pale plumage on the sides of the rump, a bird that resembles birds we have seen off North Carolina and that would be apparent on a bird at sea, given any reasonable study. Bourne and Simmons (1997) also refer to a dark-rumped specimen (no longer extant) from an August 1933 wreck of Leach's Storm-Petrels at Oneida Lake, New York (*Bird-Lore* 35 [1933]: 320), though Brinkley (pers. comm.) points out that the specimens from this wreck may have been in such poor condition that their tail coverts were absent. The only North American reports of dark-rumped Leach's known to us are of a bird off Port O'Connor, Texas (Lasley et al. 1998; G. Lasley, pers. comm.), which actually had a dingy whitish rump patch consistent with nominate Leach's, and another off Myrtle Beach, South Carolina (Davis 1998; J. Peachey, pers. comm.), which was seen well and described as completely dark-rumped, but the details of this sighting do not eliminate Swinhoe's Active seabird researchers in the western North Atlantic have never seen a dark-rumped Leach's (though R. R. Veit has noted one with a "ghost" image of a rump patch; pers. comm. to Brinkley), and research in Atlantic colonies has never revealed a dark-rumped individual (C. Huntington, pers. comm.). So, without firm evidence that nominate Leach's can show an entirely dark rump, a fully dark-rumped bird in the Atlantic Ocean should not be presumed a Leach's and should be critically examined for Swinhoe's.

The dark-rumped forms of Leach's Storm-Petrel obviously present the most complicated and difficult identification problems. Five subspecies of Leach's are currently recognized, including *O. l. leucorhoa, O. l. beali, O. l. chapmani, O. l. socorroensis,* and *O. l. cheimomnestes* (Huntington et al. 1996). Of these, only the smaller *socorroensis* and *chapmani* are comprised largely of dark-rumped individuals. The larger of these, *chapmani,* exhibits wing chord measurements of 139 to 155 mm (Huntington et al. 1996) compared to 142 to 171 for *leucorhoa* (Huntington et al. 1996) and 148 to 167 for Swinhoe's (Cubitt et al. 1992). Although Swinhoe's should be about the same size as nominate Leach's, birds captured in the North Atlantic have been as much as five percent larger (Brinkley 1995). Thus there is overlap in size between Swinhoe's and *chapmani,* but it is important to realize that the North Carolina bird was on the larger end of the spectrum for *leucorhoa* (and Swinhoe's) while *chapmani* only overlaps with the smaller end of the *leucorhoa* spectrum. The size of the North Carolina bird is, therefore, consistent with Swinhoe's captured in the Atlantic but larger than most if not all dark-rumped Leach's.

After watching this bird for over 40 minutes, there was no doubt in our minds that the bird observed on August 8 was not a Leach's Storm-Petrel. Although the dark rump and whitish patch at the base of the primaries were sufficient to hold our attention, the most

arresting differences from Leach's involved the bird's structure and flight style. The relatively narrower arm and broader, more bluntly-pointed hand created a wing shape (almost paddle-shaped when the primaries were spread) very unlike any Leach's we have ever seen. This wing shape also created a relatively larger wing area which was exaggerated by the slim body and tail, increasing the bird's distinction from Leach's. Likewise, the slow, "loping," and relatively shallower wingstrokes, the longer glides, and generally more direct flight collectively produced a flight pattern inconsistent with any Leach's we have encountered, including those we have chased. Although the flight style of Pacific Leach's (including dark-rumped forms) has been described as somewhat more subdued than that of Atlantic birds (R. A. Rowlett, pers. comm.), it is still decidedly erratic and is appropriately characterized as ricocheting by Stallcup (1990).

Michael Force, who has extensive experience with Swinhoe's in the western Indian Ocean (unpub. ms.), notes that size, shape, and flight style are the most useful characters for field identification. He emphasizes how Swinhoe's, compared to Leach's, looks relatively long-winged and short-tailed. Although on the North Carolina bird we only got a short-tailed impression when the flight feathers were spread (Figure 1), the wings always looked longer than those of nearby Leach's, and the total wing area made the body as a whole look relatively small. Because of this large wing-to-body ratio and because the rectrices were usually held tightly closed, the tail usually did look relatively "small" if not necessarily short. Force also refers to broader, more rounded wings held straight out from the body (contributing to the long-winged impression), and this description matches the North Carolina bird well (and is consistent with the description of the 1993 Swinhoe's as well [Brinkley 1995]). Although Force described the flight style of Swinhoe's under windy conditions or in foraging flight to be very much like that of Leach's, he described Swinhoe's as exhibiting a more direct flight with stiff, shallow wingbeats and little change in direction or altitude, under light winds. The latter conditions prevailed on August 8, and the storm-petrel observed on that date conforms well to the characters described in Force's manuscript. Interestingly, Force was never able to see white primary shafts (of well over 100 Swinhoe's observed at sea), although he notes that the birds rarely approached closer than 100 meters from the ship. All Swinhoe's he collected, importantly, did exhibit four or five white-based primary shafts.

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