Studies in Avian Biology No. 15:14–26, 1994.

THE UNLIKELY 18TH CENTURY NATURALISTS OF HUDSON'S BAY

C. STUART HOUSTON

Abstract. The Hudson's Bay Territory, which included the entire drainage basin west to the Rocky Mountains, although one of the most thinly occupied areas in all of North America, was second only to South Carolina as the North American locality which contributed the most type specimens of birds. The collectors, fur traders of the Hudson's Bay Company, were Alexander Light, James Isham, Thomas Hutchins, Humphrey Marten, Andrew Graham, and Samuel Hearne. My researches in the Hudson's Bay Company Archives and the Royal Society library have solved the long-standing confusion about the relative contributions of Andrew Graham and Thomas Hutchins to the *Observations* published in 1969 by the Hudson's Bay Record Society. I have transcribed for publication the separate original "journals" of Graham and Hutchins and have compiled the largest dictionary of Cree Indian names of birds. Isham and Graham collected the most type specimens. Hearne was the best naturalist. Hutchins, the medical doctor and best scientist, was the only one to have a taxon named for him.

Key Words: Hudson's Bay Territory; Alexander Light; James Isham; Humphrey Marten; Andrew Graham; Samuel Hearne; Thomas Hutchins; type specimens.

From the Hudson's Bay Territory, one of the most thinly occupied areas in all of North America, came improbable but extremely important contributions to 18th-Century ornithology. Even though it included a large drainage basin that extended west to the Rocky Mountains (Fig. 1), it seems almost inconceivable today that Hudson's Bay should have been second only to South Carolina as the North American locality which contributed the most type specimens of birds. Even more unlikely were the men who made the collections, the literate but rugged fur traders of the Hudson's Bay Company. By sheerest chance their timing was perfect, involving them and their specimens in a revolutionary new scientific endeavour led by the Swede, Carolus von Linnaeus.

The fur traders were unaware of the system newly created by Linnaeus to give each species a unique binomial Latin name. Nor could they have guessed that their specimens would be hand-painted, page-size, in four large books by George Edwards, *A Natural History of Uncommon Birds,* between 1743 and 1751. Edwards, in turn, had no inkling of the fact that Linnaeus would give Latin names to the species illustrated in his book. But this improbable sequence of events put these fur traders at the very forefront of scientific ornithology and taxonomy.

Severn, with a year-round population of 20 white fur traders, and Albany with 33, became immortalized as type localities. The other five trading posts around Hudson's Bay, including York Factory with 42 employees, gave a total population of white people in the Hudson's Bay territory of under 250. Contributions from the settled, populated and more developed areas such as Pennsylvania, Massachusetts, New York and Florida lagged far behind those from the underpopulated wild reaches of Hudson's Bay. South Carolina, the leader thanks to Mark Catesby, had almost one-thousand-fold more people than did Hudson's Bay; in 1770, Charleston, Catesby's base, was the fourth largest city in British America with a population of 10,861.

When Linnaeus published his Tenth Edition of *Systema Naturae* in 1758, Mark Catesby's *Natural History of Carolina, Florida and the Bahama Islands* (1729–1747) was the sole source for 55 species, 43 of them from South Carolina. (Another 14 species, 11 from South Carolina, were added in Linnaeus' Twelfth Edition in 1766.) Edwards' *Natural History* was the next most important source, contributing 13 species

described by Edwards from Hudson's Bay (McAtee 1957:291–300).

The Hudson's Bay Company was more than just a company with a charter for trade and an employer of fur traders; it acted as the government of its lands. As Harold A. Innis said in 1956, "The northern half of North America remained British because of the importance of fur as a staple product. . . . It is no mere accident that the present Dominion [of Canada] coincides roughly with the fur-trading areas of northern North America." As part of its assertion of its largely unstated hegemony, the Company undertook occasional forays into exploration and into science.

Each of the Company officers contributed primarily to the success of the fur trade; five of them also made direct or indirect contributions to geographic exploration. Natural history was at best an amusing sideline.

TYPE LOCALITY OF "HUDSON BAY"

Quite apart from the geographic ambiguity inherent in the citation of a vast inland sea, up to 1600 km in length and up to 1000 km in width, the general "type locality" of "Hudson Bay" used by the *American Ornithologists' Union Check-List* is inadequate or misleading for several species. Few ornithologists have appreciated that until 1870 the popular term "Hudson's Bay" (the possessive form Hudson's is no longer in official geographic use; modern maps show Hudson Bay rather than Hudson's Bay) designated an area of nearly 3.6 million km^2 extending west to the Rocky Mountains and draining into the bay (Rich 1958, Houston 1983). In this area, officially named "Rupert's Land" for 200 years, the people, as well as some of its birds and mammals, were often called "Hudsonians" (cf. Hearne 1795). For example, when Joseph Sabine described the North American form of the Black-billed Magpie, now *Pica pica hudsonia,* from a specimen collected by John Richardson and painted by Robert Hood at Cumberland House, over 1000 km by canoe from Hudson's Bay, he named it "*Corvus Hudsonius,* Hudson's Bay Magpie" (Sabine 1823). The subspecies of Striped Skunk from "the Plains of the Saskatchewan" near Carlton, about 1500 km from the bay, was similarly named *Mephitis mephitis* var. *hudsonia,* the "Hudson's Bay Skunk" (Richardson 1829:55-56). Histories of the Hudson's Bay Record Society similarly spoke of the 1714 negotiations "settling the boundary between Hudson Bay and Canada" (Davies 1965).

The designation of Hudson Bay as the type locality for species such as the Marbled Godwit, American White Pelican and Purple Martin is thus somewhat misleading, since the overwhelming probability is that these specimens came from inland, within what is now Manitoba or eastern Saskatchewan.

Let us now look at the collectors.

ALEXANDER LIGHT

The first of the Hudson's Bay Company collectors was Alexander Light. A shipwright, he was sent to Churchill in 1733 for four years at £33 per annum. Light "was sent out, . . . by the Hudson's Bay Company, on account of his knowledge of Natural History" (Richardson 1832:ix–x).

Light collected five taxa of birds (all but one new), two mammals and a turtle, each illustrated by Edwards. New bird taxa included one new species, the Spruce Grouse (*Canachites canadensis*), and three new subspecies involving North American races which Linnaeus had correctly considered as belonging to the European species (McAtee 1950): Willow Ptarmigan (*Lagopus lagopus albus*); Northern Hawk-Owl (*Surnia ulula caparoch*); Gyrfalcon (*Falco obsoletus rusticolus*).

Light also collected specimens of the Snowy Owl and the Red-necked Phalarope. Linnaeus gave the name *Falco canadensis* to an eagle portrayed incorrectly by Edwards as having feathered tarsi but a white tail, obviously a composite of two eagle specimens. This eagle was said to have been brought alive to England by an unnamed

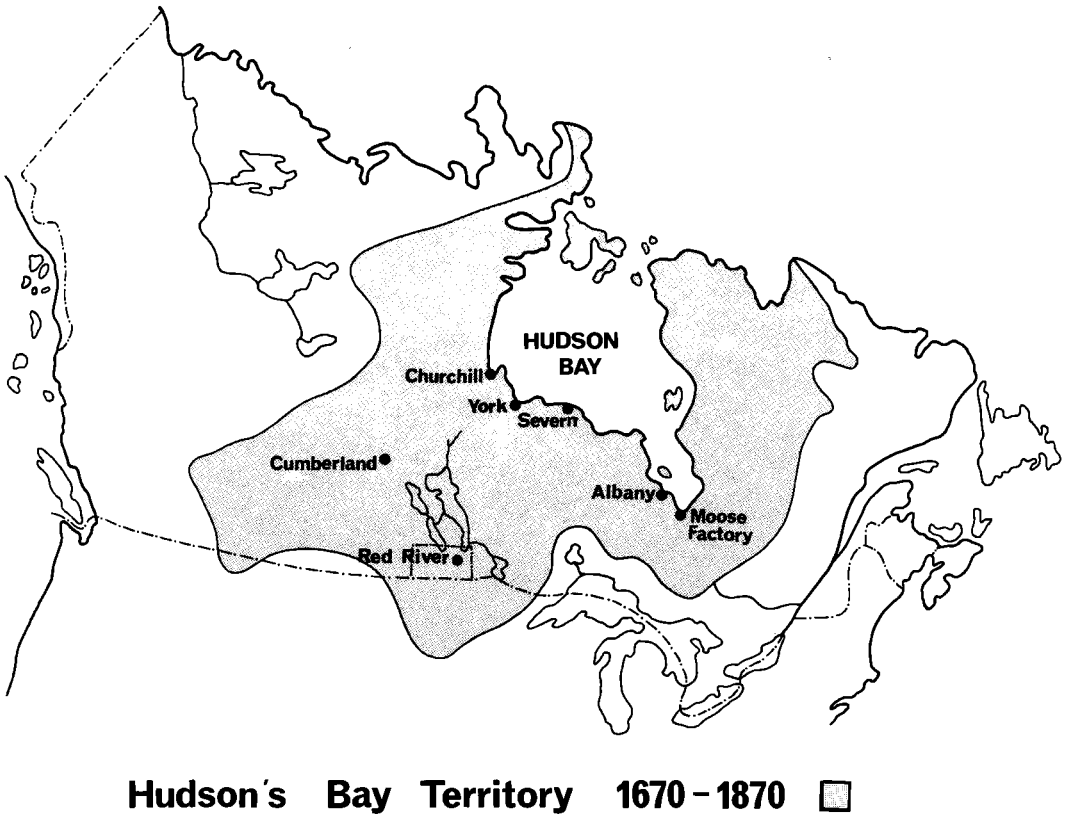

FIGURE 1. Map of Hudson's Bay Territory, 1670–1870.

"Gentleman employ'd in the Hudson's-Bay Company's Service," in all probability Alexander Light. Not until the *Fourth AOU Check-List* in 1931 was this specimen designated on very questionable grounds as the type for the North American subspecies of the Golden Eagle, now *Aquila chrysaetos canadensis.*

In 1738, Light returned to begin his second term. Light told George Edwards (1750: 152) "there is a Goose which comes in Summer to *Hudson's-Bay,* having its Forehead as it were scorched with Heat, and the Natives firmly Believe, that these Geese to avoid the Winter's Cold, fly toward the Sun, and approach so near that it singes its Forehead against his Orb. It is hard to convince these Savages that there are Climates on this Earth warmer than their own, to which Birds may fly for Food and Shelter during their rigid Winters." Edwards presumed this to be the Blue colour phase of the Snow Goose.

There was a three-way connection between Alexander Light, George Edwards and Sir Hans Sloane. It was Sloane, the President of the Royal College of Physicians, to whom Edwards dedicated his second volume. Edwards was Keeper of the Royal College Library. Alexander Light brought live birds and mammals home from Hudson's Bay for Sloane's aviary-zoo and skinned specimens for the use of Edwards, who portrayed them in his book.

JAMES ISHAM

James Isham was the second Hudson's Bay collector of important natural history specimens. Unfortunately for Isham, although his specimens were among the first to receive binomial Latin names bestowed

by Linnaeus himself, they were collected before it was fashionable to name new species after the collector. There are no species named *ishami*—and few modern ornithologists can remember his name.

Isham was a capable but plodding man who neither sought glory nor received much recognition. He is not listed in the *Canadian Encyclopedia* (1985, 1988) or its predecessor, *Encyclopedia Canadiana* (1957), nor has he received mention in the various compendia of ornithological biographies. More incredibly, his writings did not come to light in time for mention by that careful historian of early North American ornithology, Elsa Guerdrum Allen.

Isham was born in London, England, in 1716. He had a good general education for his time, but no special training in natural history. In 1732, at the age of 16, he was hired as a "writer" (and accountant) by the Hudson's Bay Company. When only 21 years old, he became the Chief at York Factory. Next he was Chief at the headquarters post of Fort Prince of Wales at Churchill. When he returned to England on his first furlough in 1745–1746, he took with him the specimens he had collected; large, interesting and edible birds were over-represented. These specimens he entrusted to George Edwards who depicted them in his splendid four-volume work. Edwards referred to Isham, who had "obliged me extremely by furnishing me with more than thirty different Species of Birds, of which we have hitherto had little or no Knowledge, the far greatest Part of them being non-descripts [not yet described to science]. . . . The Furs of the Beasts, and the Skins of the Birds were stuffed and preserved very clean and perfect . . . and brought to London in the Year 1745" (Edwards 1750:107).

Edwards painted Isham specimens that became the official "type specimens" for the following species: *Ardea herodias* (Great Blue Heron); *Anas caerulescens* (Snow Goose, blue morph)*; *Anas perspicillata* (Surf Scoter); *Tetrao canadensis* (Spruce Grouse)*; *Tetrao phasianellus* (Sharp-tailed Grouse)*; *Ardea americana* (Whooping Crane) (Fig. 2)*; *Ardea canadensis* (Sandhill Crane)*; *Rallus carolinus* (Sora)*; *Scolopax fedoa* (Marbled Godwit); *Scolopax haemastica* (Hudsonian Godwit); *Tringa fulicaria* (Red Phalarope); *Tringa lobata* (Red-necked Phalarope); *Hirundo subis* (Purple Martin). (Only the six species with asterisks, above, were discussed by Isham in his *Observations.*)

FIGURE 2. Whooping Crane, collected by James Isham, color painting by George Edwards (1750).

Not until his 12th edition in 1776 did Linnaeus describe *Falco hudsonius,* now a subspecies of Northern Harrier, *Circus cyaneus hudsonius.*

Some of Isham's birds, especially the Marbled Godwit and possibly the Purple Martin and White Pelican, were in all likelihood collected inland. For these species, the best designation of the type locality would be "Hudson's Bay territory."

Isham provided Edwards with specimens of two species mentioned in the Isham manuscript, the White-fronted Goose and Black-billed Magpie. Another sixteen spe-

cies were illustrated in the following sequence by Edwards: Three-toed Woodpecker, Belted Kingfisher, Pine Grosbeak (male and female), Snow Bunting, American Bittern, American Golden-Plover, Ruddy Turnstone, Horned Grebe, Arctic Loon, Parasitic Jaeger, Tundra Swan, King Eider and Harlequin Duck. Isham may also have contributed the Canada Goose, White-fronted Goose and Old-squaw, all from Hudson Bay, although no collector was named.

His last two years at York were miserable. His gout became worse. For two months he complained of "weakness & stoppage in his throat." He died on Monday 13 April 1761, and was buried with a 21-gun salute.

Not until 1949 were Isham's writings published in a 457-page book, *James Isham's Observations on Hudson's Bay, 1743–1749* (Rich and Johnson 1949). These included notes on 23 species of birds: the six with asterisks above and: Red-throated Loon, Common Loon, American White Pelican, Double-crested Cormorant, American Bittern, Tundra Swan, Greater White-fronted Goose, Brant, Canada Goose, Hutchin's Goose, Common Eider, Willow Ptarmigan, Rock Ptarmigan, Black Guillemot or "willock," Passenger Pigeon, Northern Flicker, Gray Jay, Black-billed Magpie, and eagle, owl, "kite" and swallow, unidentified as to species.

Isham described the American White Pelican as "a Large bird, with a great Bill Long neck't and short Legd. Carrying their neck Like a Swan . . . under the throat hangs a bag, which when fill'd wou'd hold 2 Gallons, the Substance of itt is a thin membrane, of a sky Colour, they fly Very heavy and Low, and fish is their Chiefest food, the Bouch, as well as stomach has fish found in itt. The Bouch or bag is purely to Keep their food in; they are Eat by some."

Concerning the Passenger Pigeon he said, "Its Very Rare to see any Pidgeons or doves, in these parts, or Downe by the sea side, tho in Land some hundred miles are Very Numerious, once in 12 Year I Did see some millions of them, which Came from the Southw[d] flying in Ranges as the Geese does, &c.: they are of a Blew Grey and abou't as big as a dove pidgeon and Very Good Eating."

On the last page of his *Natural History*, published in 1750, Edwards paid tribute to Isham, "to whose Curiosity and good Nature I am beholden for the greatest Part of my *History of Birds*; and I believe the curious Part of the World will not think themselves less obliged to Mr. Isham than I acknowledge myself to be."

HUMPHREY MARTEN

Humphrey Marten contributed from Albany the type specimen of the Eskimo Curlew that was named as a new species by Johann Reinhold Forster in 1772. Marten is thus important as one of the first two natural history collectors (with Andrew Graham) in what is now Ontario, and the first person known to have put up bird boxes in what is now Canada. The boxes were immediately used by Tree Swallows. Marten also played a major role in planning the first inland fur trading posts of the Hudson's Bay Company.

Marten was born about 1729. An "unusually clear-headed man," he was engaged by the Company in the capacity of "writer" on 1 March 1750. He became acting chief at York Factory during James Isham's furlough in 1758–1759. He then founded Severn, acting as chief from 1759 to 1761. He served as chief at Albany for two terms, 1764–1768 and 1769–1774. Here he did his collecting. When in charge of the headquarters post, York Factory, in 1774–1775 he both supported and directed Samuel Hearne's founding of the Company's first inland fur trading post at Cumberland House, within present-day Saskatchewan.

Marten had in many ways a difficult life at the Bayside where journals could be written only after the ink thawed, and strong beer froze solid in bottles two feet from a stout fire. Yet he undertook some of the first

farming northwest of the St. Lawrence river valley, maintaining at York Factory a flourishing breed of cattle and pigs and a fine garden.

During his second term as chief factor at Albany, 1769–1774, Marten was called upon to provide the Royal Society of London with natural history specimens and information. He sent back to England, as Samuel Hearne reported, several hundred specimens of animals and plants. Marten's initial shipment, sent with other specimens from Andrew Graham, contained 17 skins of seven species, including the skin of the Eskimo Curlew, described by Johann Reinhold Forster the next year as *Scolopax borealis*. Marten also sent home "a fine brace of Partridges a Cock & Hen," both alive, and a pair of snowshoe hares, only the male surviving the voyage.

Marten kept spring arrival dates for birds such as swallows, and reported late fall departure dates for snow buntings. He attempted unsuccessfully to have a domestic hen incubate eggs of the Sharp-tailed Grouse. For the 26 specimens of 21 species, Marten provided descriptions of the colors of soft parts that might fade before reaching England, described the color of the pupil of the eye (!), the Cree Indian name, and for all but the Snow Goose, which nested farther north, the number of eggs.

In 1949 and 1950, when Elsa G. Allen (Mrs. Arthur A. Allen) was writing her landmark history of early North American ornithology, her researches took her to the Royal Society offices in London. The librarian found for her a Marten manuscript, entitled "A Short Description of the Birds in a Box," in which Marten described 26 specimens by their native names. Mrs. Allen published Marten's description of the swallow (Allen 1951).

After his leave to Britain in 1781–1782 Marten returned to York Factory just in time to surrender York Factory to the French admiral, la Pérouse. Marten was taken back to France and held a prisoner for one year until the Treaty of Paris was signed.

ANDREW GRAHAM

Andrew Graham was born about 1733, probably near Edinburgh, Scotland. In 1749, as a lad of about 16, Graham joined the service of the Hudson's Bay Company. In 1753 he became assistant writer at York Factory under James Isham. Graham was so proficient as a clerk and accountant that he became Acting Chief at age 25 while Isham took a furlough to Britain in 1758–1759; thereafter, until 1761, Graham was second-in-command at York Factory. He was then promoted to Master at Severn House where he served until 1774, with three exceptions.

In 1770, on his return from his first English furlough and stimulated by Thomas Pennant, who had published the first three volumes of the second edition of his *British Zoology,* Graham began enthusiastically to collect natural history specimens at Severn. He encouraged Humphrey Marten at Albany to do the same.

At Severn, Graham became "the most industrious and systematic" collector (Williams 1968) among the Company factors. Among the 64 skins of 39 bird species he sent from Severn in 1771 were the type specimens for the Great Gray Owl (*Strix nebulosa*), Boreal Chickadee (*Parus hudsonicus*), Blackpoll Warbler (*Dendroica striata*), and White-crowned Sparrow (*Zonotrichia leucophrys*). These and one fish, the Longnose Sucker (*Catostomus catostomus*), were given their definitive Latin names by Johann Reinhold Forster in 1772, who gives his assessment of Graham as "a careful observer, and an indefatigable collector."

Forster failed to recognize the pelican as a species new to science. He mistakenly thought that the American White Pelican was the same as the Oriental Pelican described by Linnaeus and thus lost his opportunity to bestow a Latin name. His mistake was corrected when J. F. Gmelin in his 13th edition of *Systema Naturae,* 1789, bestowed the binomial of *Pelecanus erythrorhynchos.* Graham's natural history obser-

vations in HBC Archives manuscript E.2/12, published as *Observations,* included 41 mammals and 17 fish, as well as 92 species of birds. In the as yet unpublished manuscript E.2/5, Graham wrote of the Snow Bunting: ". . . we kill some of them with a net made for that purpose, which is put in a frame and set on the ground, one side being kept up by two sticks, and under it is scattered a little oatmeal or seeds of grass, and when they come to feed, the two sticks having a string fast to them is hawled out at pleasure, when the net falls down and all that are under made prisoners. They eat very fine in a pye."

Graham died at Prestonpans, Scotland, on 8 September 1815. Few authors have to wait 154 years after their death for their observations to be published and recognized. This was Andrew Graham's strange fate.

THOMAS HUTCHINS

Thomas Hutchins, surgeon, fur trader and meteorologist, whose name is perpetuated in Hutchins's Goose, *Branta canadensis hutchinsii,* was born somewhere in Great Britain about 1742. His first visit to Hudson's Bay was as surgeon on the *King George II,* the Hudson's Bay Company annual supply ship, which unloaded supplies and loaded the season's furs at York Factory in 1765. He returned the next summer and stayed as surgeon for the Company.

Hutchins had a scientific bent. He made his first careful measurements of temperature and atmospheric pressure during 1771–1772 when he was with Andrew Graham at York Factory. In 1774–1775 Hutchins added a set of observations on the dipping needle, and experimented with the congealing of mercury in severe cold. For the resulting publications in the *Philosophical Transactions* (1776, 1783), Hutchins was presented with the Copley gold medal by the Royal Society in December 1783, only the second Hudson's Bay man to be awarded one of the highest annual prizes in science in the 18th century.

Hutchins's detailed descriptions which accompanied the bird and mammal collections from York Factory in 1772, included careful notes of the colors of soft parts, which might subsequently fade, measurements, and Cree Indian names for a number of species. He made a greater effort than Graham to collect small songbirds such as warblers. Additional evidence of Hutchins's scientific approach is the notation by Pennant in the first edition of *Arctic Zoology* concerning the Burbot (*Gadus lota*), "Mr. Hutchins counted, in a single fish, 671,248 ovaria." However many hours or days this project required, it is evidence of the mindset and perseverance of Hutchins's scientific curiosity.

After Hutchins returned to London in 1783 to become Corresponding Secretary of the Hudson's Bay Company at £150 per annum, he gave further information to Pennant.

Concerning the Gray Jay, Hutchins said: "They feed on black moss, worms, and even flesh. When near habitations or tents, they are apt to pilfer every thing they can come at, even salt meat. They are bold, and come into the tents to eat victuals out of the dishes, notwithstanding they have their hoard of berries lodged in the hollows of trees. They watch persons baiting the traps for Martins, and devour the bait as soon as they turn their backs. These birds lay up stores for the winter; and are seldom seen in January, unless near habitations. . . . When caught, they pine away, and die, tho; their appetite never fails them. Detested by the natives of Hudson's Bay" (Pennant 1792, 2:290).

Concerning the Mourning Dove: "Mr. Hutchins informed me, a Pigeon with a reddish head, and orbits, was found far inland . . . ." (Pennant 1792, 3:7).

In 1969, almost 200 years after they were written, Hutchins's observations concerning 16 species of birds, 11 of which had not been listed by Andrew Graham, 14 species of fish, and seven species of mammals, were published as Appendix C of *Andrew Gra-*

ham's Observations on Hudson's Bay, 1767–1791 (Williams 1969).

For example, in his account of the Pectoral Sandpiper Hutchins tells of finding several bird-lice which he examined under his microscope, an instrument that even a surgeon was remarkably fortunate to own in 1772. The lice appeared like "very beautiful Tortoise-Shells." Hutchins, the surgeon-scientist, provides weights of birds, perhaps the first person to record this information in North America; 160 years later, Dr. T. S. Roberts could find only one reliable source, a taxidermist named Lano, for such weight information. Hutchins compiled Cree names for many additional species, something that Graham had initiated for about one-third (20) of the bird species in 1771.

Two new species are mentioned in the Hutchins Royal Society manuscript that do not appear in *Observations*: the Ruddy Turnstone and an unidentifiable gull. An additional species, the Chepethewuck, weight about 25 ounces, is unquestionably the Greater Prairie Chicken in E2/9: "*Pinnated Grous*: is found about Henley Settlement in Hudson's Bay, legs covered with soft brown feathers, toes naked & pecinated. The tufts which distinguish this species from all others are rooted high in the neck, not far from the hind part of the head . . . ."

Graham and Hutchins both had a firm understanding of bird migration, as Pennant had, in a time when Daines Barrington of the Royal Society was still claiming migration to be preposterous. Graham and Hutchins, knowing of Barrington's claim that swallows lie dormant during winter, made specific enquiries of Indians, both young and old, to confirm that none of them had observed such a phenomenon.

Hutchins at times kept a meteorological journal in which at York Fort in 1771–1772 he included spring migration dates and perhaps the first fall migration dates to be recorded in North America:

Sept. 12—Snow birds appear
Sept. 21—Snow birds & white geese plentiful.
Sept. 27—Snow birds increased today—geese almost gone
Oct. 4—ducks, geese & plover left us
Nov. 2—Snow birds taking their departure
Nov. 14—saw a flock of winter small birds like Tom Tits

Hutchins is the only one of the Hudson's Bay naturalists to have a bird named for him, *Branta canadensis hutchinsii.*

John Richardson wrote: "On Captain Parry's second voyage, several flocks of Geese were seen on Melville Peninsula, which were thought by the officers of the Expedition to be the *Anser leucopsis* or Barnacle. . . . A number of specimens were secured . . . I have since obtained information, which leads me to believe that they actually belong to a distinct species, hitherto confounded with the *A. Canadensis* [Canada Goose]. They are well known in Hudson's Bay by the Cree name of *Apistiskeesh,* and are generally thought by the residents to be merely a small kind of the Canada Goose, as they have the white kidney-shaped patch on the throat, which is deemed peculiar to that species. . . . We have designated the *Apistiskeesh* by the name of *Hutchinsii,* in honour of a gentleman from whom Pennant and Latham derived most of their information respecting the Hudson's Bay birds."

Richardson appended the following footnote: "Some mistake occurs in Forster's account of the Canada Goose (*Phil. Trans.,* lxii); the habits of *A. Hutchinsii* (Small Grey Goose of Graham) being ascribed to the *A. Canadensis*; while the Large Grey Goose, mentioned in the same passage, is undoubtedly the Canada Goose, which we know to be the only species that breeds abundantly about Severn River."

When P. A. Taverner (1931), ornithologist at the National Museum of Canada, undertook a revision of the Canada Geese, he confirmed the small size of the geese from

FIGURE 3. Portrait of Samuel Hearne, from the *European Magazine*, June 1797.

the arctic islands, and the "very small size and light breast and underbody . . . Weight . . . rarely as much as 5 pounds." Richardson's measurements were consistent except that he gave the culmen as 1 inch, 8½ lines or 43.5 mm., far too long. Taverner said "To anyone who has measured many Canada goose bills the solution is apparent. The feathering on the fore crown was worn away and did not give the true exposed culmen line . . . there can be no doubt that it was this little goose that Richardson designated *hutchinsii* and not its much larger relative to which the name has hitherto been attached. In order to avoid confusion with older references and to connect this bird with the man who first detected its distinctness I propose that it be known vernacularly as Richardson's goose."

Now that subspecies are no longer given vernacular names, but retain only their Latin name, "Richardson's goose" retains the single name of *hutchinsii*, and thereby honours the surgeon and naturalist who spent about 26 years on Hudson's Bay. It is highly probable that a future Check-List of the American Ornithologists' Union will accord it full specific status.

SAMUEL HEARNE

Samuel Hearne's exploits as an explorer, fur trader and author have been appreciated for more than two centuries. He is the only one of our six naturalists for whom a portrait has been found (Fig. 3). Hearne was the first European to reach the Arctic coast of North America, travelling on foot with a group of Chipewyan Indians from Churchill to the mouth of the Coppermine River. He founded in 1774 the first inland trading post of the Hudson's Bay Company at Cumberland House, now Saskatchewan's oldest settlement. This action kept the Hudson's Bay Company in competition with the much larger North West Company. As James Marsh has written, Hearne's "literary artistry . . . secured his fame in letters." Yet, modern naturalists rarely refer to Hearne's original and often incredibly apt observations. Ironically, only the historians appear to appreciate what a good naturalist he was.

Samuel Hearne was born in London, England, in 1745. He entered the navy at the age of 11, acting as servant to Admiral Hood, for six years. In 1766 he joined the Hudson's Bay Company as a seaman and mate of the *Charlotte*, a position he held for three years, sailing out of Churchill.

Hearne was chosen by Moses Norton for the Company's first major arctic exploration by land, to search for the fabled Neethasan-san-dazey or "Far Off Metal River," now known as the Coppermine River. Hearne's first journey began from Churchill on 6 November 1769, but lasted only one month and five days, because Hearne was deserted by his Indian guide, Chawchinahaw. His second attempt, with an Indian guide named Conne-e-queese, began on 23 February 1770 and lasted 8 months and five days. Hearne was forced to return when he broke his quadrant, unable to make astronomical observations.

Not a man to be discouraged easily,

Hearne set out again on 7 December 1770, this time with Mattonabee, a skillful leader of great prestige among the Chipewyan Indians. His party reached the mouth of the Coppermine River on 16 July 1771 where Hearne was the first white man to view the Arctic Ocean from the northern shore of this continent.

Hearne was next assigned in 1774–1775 to found the first inland trading post of the Hudson's Bay Company, at Cumberland Lake. Occupied continuously ever since, Cumberland House celebrated its bicentenary in 1974.

Hearne also had a moment of ignominy, when he was compelled to surrender Prince of Wales's fort to a French force under the celebrated French navigator, Jean François de Galaup, Comte de la Pérouse, on 8 August 1782. La Pérouse found and claimed Hearne's journal as a fair prize, but then returned the manuscript, already under revision, "on the express condition that he publish it" (Glover 1958). If la Pérouse was responsible for the eventual publication, the world owes him a great debt; at the least, it was a gentlemanly gesture.

Hearne then made a brazen request: that la Pérouse let him take one of the fort's trading sloops which had been seized as a fair prize of war. La Pérouse acceded and Hearne sailed the little boat on a risky journey from Hudson Strait directly back to Stromness in the Orkney Islands, a big improvement over being taken prisoner back to Cadiz, Spain.

Hearne did not sulk over his defeat and waste his time in England, as others might have done. That winter he met Thomas Pennant and gave him a copy of his natural history observations, a dozen years in advance of their publication. As Glover has said, "the meeting of the two men was valuable to both." Pennant incorporated a number of Hearne observations into *Arctic Zoology,* which first appeared in print a little over a year after their meeting. Hearne in turn inserted a number of references to Pennant in his manuscript.

With the British again in possession, Hearne returned in 1783 to restore the fort and resume charge of Churchill. He was still working on his book. Ill-health forced him to retire and return to England in 1787. Following another five years of slow and "seemingly interminable" work on his manuscript, Hearne submitted it for publication in October 1792. He received the high price of £200 for it. A month later, when he died of "the dropsy," he was only 47. The book, *A Journey from Prince of Wales's Fort in Hudson's Bay to the Northern Ocean,* his greatest achievement, was published in 1795, three years after his death.

Hearne's Journal

Hearne's journal, readily obtained from most libraries, is one of the greatest travel narratives ever written. His frank and often understated accounts of hardship and starvation are still well worth reading. Surprisingly few of Hearne's usages in reference to natural history observations are dated. The term "willick" for the guillemot, one of the smaller seabirds of the Auk family, is now obsolete. He used the word non-descript correctly to mean a species not yet described to science.

Hearne was a century ahead of his time in describing the habits of wild animals. He was an observer, not a collector. He was the first to give recognizable descriptions of the Ross's Goose, Musk-ox, and Wood Buffalo, and accounts of the habits of the Arctic Ground Squirrel and Arctic Hare. He was the first to describe the nesting of the White-crowned Sparrow, on the ground at the root of a dwarf willow or a gooseberry.

Hearne described the Ross's Goose as having the base of its bill studded with little knobs about the size of peas. This small goose was scarce at Churchill but more common 200 or 300 miles to the northwest. When another well-known fur trader and naturalist, Bernard Rogan Ross (1861), wrote about the mammals and birds used by the Chipewyan Indians, he listed the

"Horned-wavy Goose of Hearne" as a species still without a scientific name. The omission was quickly corrected that very year, when John Cassin gave the name of *Anser Rossii* to the specimen sent by Ross from Great Slave Lake. Cassin remarked that "this species has never again been noticed from the time of Hearne until the time of the receipt of the present specimens from Mr. Robert Kennicott, an enterprising young naturalist, now in the northern regions of British America, but has been constantly insisted on as a valid species in his letters to the Smithsonian Institution by Mr. Bernard R. Ross, an enthusiastic naturalist and careful observer in the service of the Hudson's Bay Company." Bernard Rogan Ross, "a tart Londonderry Irishman," was the chief trader at Fort Simpson, in charge of the entire Mackenzie district. Robert Kennicott had been the stimulus for men like Bernard Rogan Ross and Roderick Ross MacFarlane to collect specimens.

Hearne owned "an excellent microscope," a remarkable possession in that time and place. Being interested in the lice and other parasites on the Northern Lemming, he tried to examine them under the microscope. However the lens became damp with the moisture from his breath in his cold winter room, delaying further use until the busy summer season.

Richard Glover, in his introduction to the 1958 edition of Hearne's *Journey,* recognized that "Samuel Hearne was, of course, another first class observer and reporter—in fact, a much better naturalist than [Andrew] Graham . . . head and shoulders superior to every other North American naturalist who preceded Audubon." Glover singled out Hearne's accounts of the Whooping Crane and the beaver as especially well done.

Hearne understood sexual dimorphism, the male Willow Ptarmigan being larger. His description of the variable size of ptarmigan showed he had some understanding of what was later to be described as Gaussian distribution. Some of Hearne's observations on the Ruffed Grouse were a century ahead of their time. He told how this species makes its nest on the ground, generally at the foot of a tree, and lays 12 or 14 eggs. He realized as many others did not, that the noise of "drumming" was made by "clapping their wings with such a force, that at half a mile distance it resembles thunder." He noted that the pouch at the base of the pelican's beak had a capacity of three quarts, and that, in the 1770s as today, muskrat houses were favorite nesting sites for Canada Geese. Hearne examined the "windpipes" of both the Whistling and Trumpeter Swan. Although he noted that the convoluted windpipe passed into the broad and hollow breast bone of the swan and after passing the length of the sternum, returned into the chest to join the lungs, he erroneously reported that both species had identical anatomy even though their notes were quite different in pitch. Pigeons, cranes and curlews were regularly shot for food. Hearne provided one of the earliest accounts of the Passenger Pigeon, flying in large flocks in the interior near Cumberland House, where he saw 12 killed at one shot. The Whooping Crane even then was not common, usually seen only in pairs and not very often. It was good eating. The wing bones were so long and large that they were sometimes made into flutes. Hearne was the first to recognize two different species of curlew, the Hudsonian Curlew and the Eskimo Curlew. He also gave important information concerning the northern edge of the Eskimo Curlew breeding range—Egg River, on the west coast of Hudson's Bay at 59 degrees, 30 minutes north, about 150 miles north of Churchill. But he did not restrict his attention to edible birds; he also described small birds such as the chickadee.

He understood well the concept of bird migration, but also recognized that other species such as the ptarmigan and Arctic Hare were year-round residents. He described the Trumpeter Swan as the first species of waterfowl to return in spring, sometimes as early as late March, before the ice

of the rivers had broken up. At that time they frequented the open waters of falls and rapids.

Hearne provided valuable information concerning the numbers of some species of animals at the time when the fur trade reigned supreme. In January 1775 at Cumberland House the men brought back 26 grouse on one occasion and on another day brought 13 sledge loads of elk meat to the fort. Within half a mile of Churchill as many as 40 Arctic foxes could be killed in one night, while during one winter 120 foxes in the traps were destroyed by other foxes. In 1774 Hearne's men killed 11 black bears in one day of canoe travel between York Factory and Cumberland House. At Anawd Lake in the North West Territories 20 or 30 hares could be snared in a single night. One Indian could kill 20 Spruce Grouse in a day with his bow and arrow. Some Indians would kill upward of a 100 Snow Geese in a day, whereas the most expert of the English hunters would think it a good day's work to kill 30. At Albany Fort in one season 60 hogsheads of them were salted for winter consumption. Arctic Terns, ranked by Hearne among "the elegant part of the feathered creation," occurred in flocks of several hundreds; bushels of their eggs were taken on a tiny island.

Hearne once saw a flock of over 400 Willow Ptarmigan near the Churchill River. The Indians framed nets on stakes, placed over gravel bait, to entice ptarmigans to gather under the net. When the stake was pulled to drop the net on top of the birds, three people could catch up to 300 in one morning. In the winter of 1786 Mr. Prince at Churchill caught 204 ptarmigan with two separate pulls. Ptarmigan feathers made excellent beds and the feathers were sold at the rate of 3 pence per pound. The smaller Rock Ptarmigan would not go under nets but up to 120 could be shot in a few hours.

From our point of view Hearne's account of the large subspecies of the Canada Goose best reveals his scientific bent of mind. He met these very large geese on the barren grounds. Most naturalists who read Hearne appear to have walked right by this one. He did not call them the Barren Geese because they summered on the barren grounds, but rather because of the "exceeding smallness of their testicles."

The modern status of this large goose has been somewhat controversial. Hanson's book, *The Giant Canada Goose,* published in 1965, presents the results of recent research. Hanson believes that the Canada Geese nesting in Minnesota and Southern Manitoba and Saskatchewan belong to the giant race, *Branta canadensis maxima,* previously believed to be extinct. This race is characterized by a wing span of six feet or more in adult males, an unusually long neck, and frequently a white spot above the eye. They weigh anywhere from 8 pounds for an immature female to 18 pounds for an adult male, certainly reaching the 16 to 17 pounds weight cited by Hearne.

Hanson also tells about the capture of flightless Canada Geese on the tundra in Keewatin Territory. Some of these immature birds carried bands previously placed on them in Minnesota and Manitoba. They had journeyed about 1000 miles north in order to molt. Because they were not breeding they arrived in the far north later in the year than the other geese, as Hearne had said. Since they did not breed that summer, they had small testicles. Thus it took nearly two centuries to elucidate the precise scientific explanation for the phenomenon noted with such insight by Samuel Hearne, perhaps the most talented of the early naturalists on this continent.

CONCLUSION

The six fur traders from Hudson's Bay not only made contributions that must not be forgotten, but they set the stage for the arrival of Dr. John Richardson, surgeon and naturalist with the two arctic exploring expeditions led by Sir John Franklin in 1819–1822 and 1825–1827. Both expeditions, in whole or in part, came and left through the HBC depot of York Factory on Hudson Bay

and relied extensively on the Company for supplies and for manpower. Richardson was assisted by Robert Hood on the first expedition and Thomas Drummond, who collected separately in the Canadian Rocky Mountains, on the second expedition. From Saskatchewan alone, Richardson, Hood and Drummond collected and/or named seven new species, Wilson's Phalarope, Franklin's Gull, Forster's Tern, Olive-sided Flycatcher, Chipping Sparrow, Smith's Longspur, and Rosy Finch, and seven subspecies. In the Rocky Mountains, Drummond took the type specimens of the White-tailed Ptarmigan and the Black-backed Three-toed Woodpecker, while the Trumpeter Swan was named from Hudson Bay. As a result of Richardson's observations, birds of the Saskatchewan River were better catalogued, before settlement, than any other region in North America.

ACKNOWLEDGMENTS

I wish to thank University of Toronto Press for permission to select, abridge and modify a portion of the text from my forthcoming book, co-authored by my wife, Mary Houston, *18th Century Naturalists of Hudson Bay*. The Hudson's Bay Company Archives, Provincial Archives of Manitoba, allowed permission to reproduce bird migration notes transcribed from the York Factory Journal of 1771–1772, HBCA B.239/a/66, by Dr. William B. Ewart. Glyndwr Williams and W. Earl Godfrey provided constructive criticism of portions of this material.

LITERATURE CITED

ALLEN, E. G. 1951. The history of American ornithology before Audubon. Transactions of the American Philosophical Society, new series, 41:386–591.

CATESBY, M. 1729–1747. The Natural History of Carolina, Florida, and the Bahama Islands. Published privately, London.

DAVIES, K. G. 1965. Letters from Hudson Bay, 1703–40. Hudson's Bay Record Society, London.

EDWARDS, G. 1750. A natural history of uncommon birds, Vol. 3. Published privately, London.

FORSTER, J. R. 1772. An account of the birds sent home from Hudson's Bay, with observations relative to their natural history; and Latin descriptions of some of the most uncommon. Philosophical Transactions 62:382–433.

GLOVER, R., ed. 1958. A Journey to the Northern Ocean, by Samuel Hearne. Macmillan, Toronto p. xi.

GLOVER, R. 1969. Introduction. Pp. xiii–lxxii *in* G. Williams (ed.), Observations on Hudson's Bay by Andrew Graham. Hudson's Bay Record Society, London.

GMELIN, J. F. 1789. Systema Naturae, Thirteenth Edition. J. B. Delamolliere, London.

HANSON, H. C. 1965. The Giant Canada Goose. Southern Illinois University Press, Carbondale.

HEARNE, S. 1795. A journey from Prince of Wales's Fort in Hudson's Bay to the Northern Ocean, 1769, 1770, 1771, 1772. A. Strahan & T. Cadell, London.

HOUSTON, C. S. 1983. Birds first described from Hudson Bay. Canadian Field-Naturalist 97:95–98.

HUTCHINS, T. 1776. An account of the success of some attempts to freeze quicksilver at Albany Fort, in Hudson's Bay, in the year 1775, with observations on the dipping needle. Philosophical Transactions 66:174–181.

HUTCHINS, T. 1783. Experiments for ascertaining the principle of mercurial congelation . . . Philosophical Transactions 73:305–306, 329, 341, 343.

INNIS, H. A. 1956. Pp. 391–392 *in* The fur trade in Canada: an introduction to Canadian economic history. University of Toronto Press, Toronto.

LINNAEUS, C. 1758. Systema Naturae, Tenth edition. L. Salvii, Stockholm.

LINNAEUS, C. 1766. Systema Naturae, Twelfth edition. L. Salvii, Stockholm.

MCATEE, W. L. 1950. The North American birds of George Edwards. Journal of the Society for the Bibliography of Natural History 2:194–204.

MCATEE, W. L. 1957. The North American birds of Linnaeus. Journal of the Society for the Bibliography of Natural History 3:291–300.

PENNANT, T. 1784–1785. Arctic zoology. Henry Hughs, London. 3 vols.

PENNANT, T. 1792. Arctic zoology, Second edition. Robert Faulder, London. 3 vols.

RICH, E. E. 1958. Pp. 52–60 *in* The history of the Hudson's Bay Company, 1670–1870. Vol. 1. Hudson's Bay Record Society, London.

RICH, E. E., AND A. M. JOHNSON. 1949. James Isham's observations on Hudson's Bay, 1743–49. Champlain Society, Toronto.

RICHARDSON, J. 1829. Fauna Boreali-Americana. Vol. 1, The Mammals. John Murray, London.

RICHARDSON, J., AND W. SWAINSON. 1832. Fauna Boreali-Americana. Vol. 2, The Birds. John Murray, London. [Introduction is by Richardson; all useful bird notes are by Richardson.]

ROSS, B. R. 1861. An account of the animals useful in an economic point of view to the various Chipewyan tribes. Canadian Naturalist & Geologist 6:433–434.

SABINE, J. 1823. Zoological appendix (V.). Pp. 647–703 *in* Narrative of a journey to the shores of the Polar Sea in the years 1819, 20, 21, and 22. John Murray, London.

TAVERNER, P. A. 1931. A study of *Branta canadensis* (Linnaeus), the Canada Goose. National Museum of Canada, Bulletin 67:28–40.

WILLIAMS, G. 1968. Hudson's Bay Record Society. [4 pp. pamphlet announcing the forthcoming publication in 1969 of Observations.]

WILLIAMS, G. 1969. Andrew Graham's observations on Hudson's Bay, 1767–91. Hudson's Bay Record Society, London. 423 + lxxii pp.

WILLIAMS, G. 1978. Andrew Graham and Thomas Hutchins: collaboration and plagiarism in 18th-century natural history. The Beaver 308:4–14.