DEAN OF AMERICAN ORNITHOLOGISTS: THE MULTIPLE LEGACIES OF FRANK M. CHAPMAN OF THE AMERICAN MUSEUM OF NATURAL HISTORY

Author: Vuilleumier, François

Source: The Auk, 122(2) : 389-402

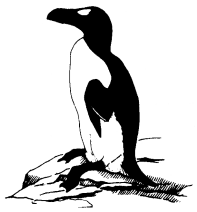
Published By: American Ornithological Society

URL: https://doi.org/10.1642/0004-8038(2005)122[0389:DOAOTM]2.0.CO;2

The Auk

A Quarterly
Journal of Ornithology

Vol. 122 No. 2 April 2005



The Auk 122(2):389–402, 2005

PERSPECTIVES IN ORNITHOLOGY

DEAN OF AMERICAN ORNITHOLOGISTS: THE MULTIPLE LEGACIES OF FRANK M. CHAPMAN OF THE AMERICAN MUSEUM OF NATURAL HISTORY

FRANÇOIS VUILLEUMIER[1]

Department of Ornithology, American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024, USA

FRANK MICHLER CHAPMAN, the "acknowledged dean of American ornithologists" (Lanyon 1995), was a great systematist who paved the way for modern research on South American birds. He was also an intrepid explorer, a major contributor to the growth and development of museum education, and a respected conservationist. His lectures were popular, his books ushered in the era of field ornithology and birding, and his enthusiasm for Barro Colorado Island helped make that 1,500-ha speck of land a world-renowned center for tropical research. Here, I describe some of those accomplishments and their legacies, first reviewing Chapman's career, then focusing on his qualities as an administrator ("The Chief") and on the staff he gathered around him ("the golden years"), before turning to his philosophy of museum education, his dual personality as a collector and conservationist, his research in avian systematics and biogeography, and his role in popularizing Barro Colorado Island as a tropical research center. Finally, I discuss the Chapman Fund, perhaps his best-known legacy, which was created after his death 60 years ago.

[1]E-mail: vuill@amnh.org

CHAPMAN'S CAREER

Frank Michler Chapman died in New York City on 15 November 1945, at age 81. He had "reported for duty" at the American Museum of Natural History (AMNH) 57 years earlier, on 1 March 1888, as assistant to Joel Asaph Allen, at a "salary of fifty dollars a month" (Chapman 1933: 59). He spent the next 54 years at the AMNH, 22 of them (1920–1942) as the first Chairman of its Department of Ornithology. Twenty-six years older than Chapman, Allen was an extraordinary figure himself. A former student of Louis Agassiz at the Museum of Comparative Zoology (MCZ) at Harvard University, Allen (1838–1921) had come to the AMNH three years before Chapman, on 1 May 1885, to head the newly created Department of Mammals and Birds (Chapman 1922a, 1927). Joel Allen was elected to the National Academy of Sciences (1876), cofounded the American Ornithologists' Union (1883) and became its first president (1883–1890), edited *The Auk* for 28 years (1884–1911), headed the Department of Mammals and Birds at the AMNH for 35 years (1885–1920), co-authored the first three editions of the *Check-List of North American Birds* (1886, 1895, 1910), pursued research programs in mammalogy, ornithology, systematics, and biogeography,

and published more than 1,400 monographs, papers, and notes (Allen 1916).

Working under Allen in the department of mammals and birds, Chapman became curator in charge of birds in 1908 and associate curator of birds in 1910. Chapman's big break came in 1920 when "a separate department of birds was established, of which he was named Chairman, remaining at the helm until his retirement on June 30, 1942" (Murphy 1950:312). Like Allen, Chapman was elected to the National Academy of Sciences (1921). He also became president of the AOU (its tenth, 1911–1914) and received its Brewster Medal in 1933 for a revised edition of his *Handbook of the Birds of Eastern North America*. He published 17 books, hundreds of scientific articles and notes, and scores of editorials and popular pieces.

Chapman carried out field work on Neotropical birds in the West Indies, from Mexico to Panama, and from Colombia to southern Chile. Distinguished ornithologists described species or subspecies of birds in his honor (e.g. Elliott Coues, Robert Ridgway, Carl Hellmayr, W. E. Clyde Todd, and Jacques Berlioz, as did his staff members, including Elsie Naumburg, Ludlow Griscom, John Zimmer, and Thomas Gilliard). Several of the species and subspecies named for Chapman ended up as synonyms of other taxa, but Hellmayr's (1907) Chapman's Swift (*Chaetura chapmani*) and Gilliard's (1940) Chapman's Bristle-Tyrant (*Phylloscartes chapmani*) are still considered valid species.

Chapman met some of the greatest ornithologists of his time, including, in America, William Brewster, Charles B. Cory, Daniel G. Elliot, Edgar A. Mearns, C. Hart Merriam, and Robert Ridgway. Chapman (1933:41) "was awed by the casual manner in which [Brewster] said he would describe as new races various birds of which he had collected as specimens." Merriam, he wrote, "is a genius and the fact is stamped on him" (Chapman 1933:44). "Coues was not a man to talk to unless you had something to say, or he considered you a worthy listener" (Chapman 1933:51). About Ridgway, Chapman (1933:44) stated: "You might advance views contrary to his published statements and known ideas and he would simply smile and not contradict you." Mearns and Chapman "had the habit of working late—long after the elevator had stopped running—and would go down the stairs with locked arms singing—for some unknown reason—a song about the Wild Man of Borneo" (Chapman 1933:63–64). About Cory: "I have never met a man so gifted as Charles Cory. He had the inherent potentialities as well as the means to win marked success in a surprising number of widely different fields" (Chapman 1933:53). In England, at the 1905 International Congress of Ornithology, Chapman met famous "ornithologists with whose work I had long been familiar" (Chapman 1933:176): Alfred Newton, Philip Lutley Sclater, R. Bowdler Sharpe, Walter Rothschild, and Ernst Hartert from England; Hans von Berlepsch from Germany; Carl Hellmayr from Austria and Germany; Einar Lönnberg from Sweden; and Arrigoni degli Oddi from Italy. "Of all this group, Sharpe was the outstanding figure," he claimed (Chapman 1933:177).

Chapman pioneered museum exhibition techniques, published the *Handbook of Birds of Eastern North America* (1895) and other books that helped the development of field identification, founded in 1899 and edited for 35 years (until 1934) the journal *Bird-Lore* (which became *Audubon Magazine*), initiated the Christmas Bird Counts, popularized science through lectures and publications, organized and took part in major collecting expeditions to Latin America, published treatises on Colombian and Ecuadorian birds, spent four years over 12 seasons (1925–1937) on Panama's Barro Colorado Island and helped to make it a hot-spot of research in tropical biology, developed remote-controlled photography to document the behavior of nocturnal birds and mammals, wrote stimulating life histories of tropical birds, and attracted talented men and women to the AMNH. As if this were not enough, Chapman also increased the AMNH skin collection from about 50,000 specimens in Joel Allen's time to about 200,000 in 1920 and to more than 800,000 when he retired in 1942. That growth included the purchase, with help from AMNH trustee and Yale physician Leonard C. Sanford (Murphy 1951) and New York philanthropist Harry Payne Whitney (Harlow 1936), of 280,000 skins from the collection of Tring's Lord Walter Rothschild (Rothschild 1983), which made the holdings of the Department of Ornithology of the AMNH the most complete in the world (Murphy 1932, LeCroy 1989). Although not authoritarian, Chapman was strong-willed; some of his staff called him "The Chief."

"The Chief"

Here is how Murphy (1950:309) described Chapman:

> Physically, he was just under average stature, but well formed, perfectly erect, and sprightly in movement.…He always retained a good proportion of his teeth and his light brown hair, baldness not progressing beyond the 'high forehead' stage. His eyes…could be equally expressive in kindliness and in an almost beady aloofness....His voice was well modulated and pleasing.…He was a frank Anglophile.…He had plenty of iron in his essentially gentle nature, as indicated by countless instances of self-control. When he discovered…that smoking…60 to 80 black Cuban cigarettes a day was lowering his efficiency, he gave up tobacco abruptly and permanently.

Chapman was also a good businessman, appreciated wildlife art (he greatly admired Louis Agassiz Fuertes; Chapman 1928b), had an excellent ear for music, enjoyed New York's club life (he was a member of the Century Club and of the Explorer's Club), and was very fond of golf (for more details, see Zimmer 1946, Gregory 1949, Murphy 1950, Chapman 1933).

Frank Chapman was born on 12 June 1864 in Englewood, New Jersey. After graduating from the Englewood Academy in 1880, he worked at the American Exchange National Bank in New York City; but his heart was not in banking, it was in natural history, and after six years he resigned and traveled to Florida to collect and study birds. Two years later, Joel Allen hired him at the AMNH. He received the honorary degree of Doctor of Science from Brown University in 1913. Of his marriage to Fannie Bates Embury on 24 February 1898, at age 34, he wrote (Chapman 1933:161):

> When a man wedded to his profession takes a mortal wife he commits a very dangerous type of bigamy. If the two spouses do not agree there arises a three-cornered conflict to determine which one of them will be widowed. If they are in harmony, a man may indeed consider himself twice blest. I was among the fortunate ones…

Fannie Chapman died a year before her husband in 1944. The couple had one child, a son, Frank M. Chapman, Jr. (born 1900), who enlisted in the United States Marine Corps, where he rose to the rank of major. From about age 6 to 16, Chapman *fils* accompanied his father (and mother) during many trips. Of his wife, Chapman (1933:160) *père* wrote: "I acquired a helpmate who…has made it the chief object of her life to advance the aims of mine." Fannie Chapman must have had a crucial influence on her husband and therefore on whatever legacies he left us. She appears as "Mrs. Chapman" in his *Autobiography of a Bird-Lover*. Early in their marriage, he "*permitted* [italics mine] Mrs. Chapman to try her hand at bird-skinning on a Long-billed Marsh Wren, too badly shot to be worth preserving" (Chapman 1933:161). She turned out to be so good at it that he wrote: "To [my] mixed astonishment, joy, and chagrin, her skilful fingers made so good a job of it that her second specimen was one of the Sparrows so rare that I handled them myself with caution." A photograph of Fannie Chapman skinning a pelican at Oak Lodge in Florida appears in *Autobiography of a Bird-Lover* (Chapman 1933: facing page 163). Pretty in a long dress and a ruffled bonnet, she holds the carcass of the large bird. How difficult it is to imagine her in such an outfit on rough field trips with her husband ("during…twenty-five years she accompanied me on expeditions ranging from British Columbia to Tierra del Fuego"; Chapman 1933: 163). Fannie Chapman's role in her husband's life was mentioned by Palmer (1950) in the obituary of her that he published in *The Auk*, but unfortunately that notice has remained all but ignored because she is referred to as Fannie Miller Bates ("Mrs. Frank M. Chapman" was only added in parentheses).

The chief was well liked, even revered, by some members of his staff, but less so by others—a usual state of affairs for a department chairman. With a couple of exceptions, I do not think that Chapman was actually disliked, something that cannot be said of all department heads. Chapman told his staff what was expected of them when they were hired, and they were then free to carry out their job. Nevertheless, occasionally he behaved as the boss and made decisions that had far-ranging consequences for the careers of some staff members. Whereas Chapman carried out much fieldwork, he did not necessarily allow others to do likewise. Thus, Ernst Mayr told me that Chapman had hired him to study the

Rothschild-Whitney collections and to publish papers on them but did not permit him to do fieldwork. That negative decision may have had a positive effect on science, because Mayr expanded his activities to include evolutionary biology and the history of biology. The bird department's first chairman managed it for 22 years that Lanyon (1995:117) called "golden."

Chapman's Staff during the "Golden Years"

In an early description of the Department of Birds, Chapman (1922b) included its origin and development, listed its staff members, mapped the location of the 64 expeditions that took place from 1887 to 1921, provided information on the research collections, and explained the role of the exhibitions. A look at the decade *circa* 1924–1934 will give an idea of Chapman's era.

At any given time during that 10-year period, the curatorial staff consisted of a combination of five curators, from among eight men, listed in chronological order of hire: Frank M. Chapman (1888–1942 [retired]), Waldron DeWitt Miller (1903–1929 [died]), James Paul Chapin (1916–1949 [retired]), Ludlow Griscom (1918–1927 [resigned]), Robert Cushman Murphy (1920–1955 [retired]), John Todd Zimmer (1930–1957 [died]), Ernst Mayr (1932–1953 [resigned]), and E. Thomas Gilliard (1941–1965 [died]). A 1924 photograph in Davis (1994: after page 64) shows, from left to right, Griscom (age 34), Miller (45), Chapman (60), Murphy (37), and Chapin (35). A 1934 photograph (Lanyon 1995:120) shows, also left to right, Mayr (30), Murphy (47), Chapman (70), Chapin (45), and Zimmer (45). Gilliard, who had been a volunteer since 1932, had not yet been formally hired. Other, noncuratorial staff members also played an important role in the golden years. Who were those individuals and how did Chapman influence them?

Waldron DeWitt Miller.—Miller (1879–1929) joined the AMNH as an assistant in 1903, and became Assistant Curator in 1911 and Associate Curator in 1917. He died at 50 after a traffic accident (Chapin 1932a). Miller and Griscom collected in Nicaragua in 1917, where they got along well; but after their return to the museum, their relationship soured (Davis 1994). Miller failed to write the expected monograph on the bird-life of Nicaragua. Irritated, Chapman asked Griscom to carry out the job, and Miller resented Griscom for it (Davis 1994). An unfortunate result of that dispute was that the Nicaragua monograph was never produced. Griscom might have written it, but he left the AMNH for the MCZ in 1927, after his own disagreement with "The Chief." Miller's papers, for example on ptilosis (Miller 1915), and his taxonomic revisions (Miller 1912) are still valuable. Miller was aware of evolutionary problems (Miller 1924:6):

> An important feature of the aftershaft is the fact that it is not an adaptive character. As is well known, most characters are subject to adaptive changes which obscure their systematic value.

Chapman named a new genus and species of hummingbird, *Waldronia milleri* [the Tepui Goldenthroat, now *Polytmus milleri*] in his memory, stating that in Miller's death the "museum has sustained an irreparable loss" (Chapman 1929b:15).

James Paul Chapin.—Chapin (1889–1964) was one of the world's most eminent specialists on African ornithology (Friedmann 1966). He spent an uninterrupted period of five and one-half years (1909–1914) in the rainforests of the former Belgian Congo as a member of the Herbert Lang–James Chapin Expedition. Later he returned five times to Africa. In the introduction to *The Birds of the Belgian Congo* (Chapin 1932b, 1939, 1953, 1954), he stated (Chapin 1932b:6): "After urging the inception of the present report, Dr. Frank M. Chapman… has continued to stimulate it in every way…." Indeed, Chapman was behind the project all the way, even though he himself was interested in American, not African, birds. Like his colleagues, Chapin was extremely talented. He was multilingual, he executed wonderful pencil sketches and delicately tinted watercolors, and his museum skins are works of art. Chapin's weaknesses were that he never said "no" to anyone who asked for his assistance and that he was a perfectionist. Chapman became annoyed at him for taking so long to complete *The Birds of the Belgian Congo*. Chapin was president of the AOU (1939–1942) and president of the Explorer's Club (1949–1950).

Ludlow Griscom.—Griscom (1890–1959), a virtuoso in field identification, was called the "dean" of birders (Davis 1994). His other skills were music, botany, and languages (Davis 1994). After collecting birds on expeditions to Central America, he became an authority on the birds of that region (Griscom 1932, 1935).

The subtitle of his monograph on the birds of Guatemala, *A Contribution to a Study of the Origin of Central American Bird-Life* (Griscom 1932), is nearly identical to the subtitle of Chapman's (1926) book on the birds of Ecuador. Griscom's Guatemalan treatise is clearly modeled after Chapman's Colombian and Ecuadorian monographs. The most famous of Griscom's new species is probably the now-extinct Atitlan Grebe (*Podilymbus gigas*). After spending a decade under Chapman's tutelage, he developed differences of opinion and in 1927 resigned to become assistant to Thomas Barbour, director of the MCZ. Griscom was offered the presidency of the AOU in 1957 but immediately resigned because of declining health, and Ernst Mayr assumed the job.

Robert Cushman Murphy.—Murphy (1887–1973) was the world's foremost authority on seabirds, the subject of his monumental *Oceanic Birds of South America* (Amadon 1974). The material on which Murphy based his research was obtained during the Brewster–Sanford Expedition. Sanford, of course, was the famous AMNH trustee who helped purchase the Rothschild collection. Another of Chapman's gifted staff members, Murphy was also a historian, an oceanographer (Murphy 1923), a writer, and a classical scholar. In *Logbook for Grace* (Murphy 1947), the account of his nearly year-long voyage to South Georgia on the whaling brig "Daisy," he wrote that he took along Dante's *Divina Commedia*, Horace's *Carmina*, and the "Oxford Shakespeare." *Oceanic Birds of South America* has never been equaled and perhaps never will be. Like Chapman, Murphy was a member of the Century Club. Murphy was president of the AOU from 1948 to 1950.

John Todd Zimmer.—Hired in 1930, Zimmer (1889–1957) was one of the leading specialists on the systematics of South American birds (Murphy and Amadon 1959). Chapman expected Zimmer to write a monograph on Peruvian birds, parallel to his own on Colombia and Ecuador. Chapman had sponsored expeditions to Peru, where more than 17,000 skins had been collected by Harry and Casimir Watkins, George K. Cherrie, Edmund Heller, and Carlos Olalla and his sons. Zimmer (1931:1–3) described the project thus:

> In December, 1910, Dr. Frank M. Chapman inaugurated a plan for the preparation of a series of monographs dealing with the origin and distribution of the bird-life of the Andes. This plan already has borne notable fruit in the shape of two volumes by Dr. Chapman on two of the Andean countries [Colombia and Ecuador].…Continuing southward from Ecuador along the chain of the Andes, the next country to be treated is Peru.…Necessarily this project requires much preliminary taxonomic work to determine the identity of the Peruvian forms and their relationship to the forms of other Neotropical countries.

Zimmer became thoroughly engrossed in "preliminary taxonomic work" and published 66 "Notes on Peruvian birds" in the *American Museum Novitates* (1931–1955). Because Zimmer kept producing one *Novitates* after another, Chapman rightly worried that the comprehensive volume would not be written (E. Mayr pers. comm.). Zimmer received the AOU's Brewster Medal in 1952 and was Editor of *The Auk* from 1942 to 1948. Like Chapman, Zimmer was a member of the Explorers' Club.

Ernst Mayr.—Mayr (1904–2005) was the undisputed authority on the systematics of birds of the Southwest Pacific. While at the AMNH (1932–1953), he published numerous papers on the birds of New Guinea, the Solomon Islands, and other Pacific archipelagos; but in the biological world at large, he is known as one of the "architects" of the "evolutionary synthesis" (Haffer 1995, Bock 2004). The hiring of Mayr at the AMNH was largely brought about by Chapman, who was much aided in this by Mayr's former mentor, Erwin Stresemann of Berlin, by Lord Walter Rothschild of Tring, and by the indefatigable patron of the Bird Department, Leonard Sanford.

Ernest Thomas Gilliard.—Gilliard (1912–1965) was an authority on the birds of New Guinea (Murphy and Amadon 1966). He started work at the AMNH as a volunteer in 1932. Gilliard collected birds during several expeditions, including the first ornithological exploration of the Sierra de la Macarena in eastern Colombia (Gilliard 1942). Gilliard later carried out expeditions to New Guinea. Gilliard was a gifted photographer and cinematographer and wrote popular accounts of his expeditions. He died suddenly at age 52. Gilliard was greatly influenced by Chapman. In Murphy's words (Murphy and Amadon 1966:419):

> Dr. Chapman…never bubbled with eagerness to be chummy with new acquaintances. On the contrary, he had tight reserve; one had to earn…a stake in the affection of the chief. I never saw anyone win this as quickly as Tom [Gilliard], or more lastingly.

Like Chapman, Gilliard was a member of the Explorers' Club. Gilliard named one of his two sons, Chapman.

Noncuratorial staff members.—In addition to curators, several persons worked as assistants or associates during the department's golden years. One of them was Jonathan Dwight, Jr. (1858–1929), who wrote monographs on molt and gulls (Dwight 1900, 1925; Fleming 1930). His work on molt is still cited today (Thompson and Kitaysky 2004). Another staff member was Elsie Margaret Binger Naumburg (*née* Binger, 1880–1953). She started working as a research assistant in 1920 and became a research associate in 1924, a post she held until her death (Zimmer 1955, LeCroy 1997). She sponsored Emil Kaempfer's expeditions to Brazil and Paraguay (Naumburg 1935) and published a monograph on the birds of Mato Grosso (Naumburg 1930). It was Elsie Naumburg who created the Chapman Fund. Research assistant Austin L. Rand (1905–1982) wrote monographs on the birds of Madagascar (Rand 1936) and New Guinea (Mayr and Rand 1937), before going to the Field Museum in Chicago (Traylor et al. 1984). And Charles E. O'Brien (1905–1987), who knew the location of every specimen in the AMNH collection, started as a research assistant in 1924, became associate curator, and retired in 1973.

Chapman as a Museum Educator

Never at a loss for catchy expressions, Chapman entitled an essay "Natural History for the Masses" (Chapman 1902). He claimed that outstanding scientific collections were basic to first-rate scientific work. In turn, only first-rate scientific work could ensure that first-rate exhibition and education programs could be produced. Some museum visitors have a specific goal (or object, in Chapman's terminology): for example, to learn the name of a mineral or to confirm the identification of a mammal. Chapman, however, was especially concerned about "idle" visitors: "A museum's exhibits must…catch the attention of the objectless visitor; they must be interesting; they must appeal to sightseers as well as to fact-seekers." To "hook" idle visitors, museums must have eye-catching exhibits and exciting lectures. For maximum effectiveness, the lectures must be given at the museum and in collaboration with other institutions, such as "the Board of Education of New York City and Columbia University." Chapman considered a third important aspect of museum education to be its "influence on natural history art":

> There is hardly a prominent American animal artist who does not habitually look to the museum for assistance.…Thousands of illustrations based wholly on museum specimens illumine the pages of dictionaries, cyclopædias, natural history and other books, to say nothing of current magazines.

Chapman's three pillars of museum education (exhibits, lectures, and accessibility of its collections to illustrators) are still relevant at the museum more than 100 years later. The AMNH strives to have first-class exhibits and outstanding lecture series, and wildlife artists use its collections. For example, Roger Tory Peterson painted AMNH bird skins for his field guides to North American birds, and so did Guy Tudor (Ridgely and Tudor 1989, 1994) and Sophie Webb (Howell and Webb 1995) for guides to South American and Mexican birds, respectively.

From the late 1890s to the mid-1930s, Chapman, not content simply to encourage museum education, delivered many lectures and developed new exhibit techniques, especially the "habitat group" (now called diorama). The Cobb's Island group was the first: "It shows a section of beach 6 by 18 feet with its birds on their nests and in the air, and its vegetation so arranged to merge with a painted background of the ocean that, at a short distance, one cannot tell where the group itself ends and the painting begins." The Cobb's Island habitat group was prepared in response to a challenge by John L. Cadwalader, a wealthy man who had asked Chapman (1933:164): "if I were to give you a check for [naming a generous sum] could you make a better bird group than there is in the British Museum?" After the Cobb's Island group, Chapman carried out many expeditions "to secure material and data" (Chapman 1933:192) for new dioramas. Habitat groups

faithfully depict specific parts of the world at a given time, with samples of their fauna and flora (Chapman 1902:2766–2767):

> Swamp, meadow, beach, cliff and tree-top are shown with convincing realism. These exhibits are extremely beautiful and therefore attractive, and the important facts they represent are thus brought to the attention of many whose interest would not be gained in any other way.

An Apparent Paradox: Chapman, Collector and Conservationist

When a young man, Chapman (1933) collected and then ate two Passenger Pigeons (*Ectopistes migratorius*). In 1889, he collected 13 Carolina Parakeets (*Conuropsis carolinensis*) and one Ivory-billed Woodpecker (*Campephilus principalis*). Chapman (1933:90–93) later wrote:

> If I had been more familiar with the Paroquet's past and could have predicted Florida's future, it would, I believe, have been advisable for me to have secured as many of these Paroquets as possible. As it was I took thirteen, preparing some as skeletons, the only ones we have in the museum.
>
> It was my good fortune to encounter the one Ivory-billed Woodpecker seen on the voyage. I knew its voice the moment its loud *yap-yap* fell on my ears. Then followed memorable moments as I stalked it through the cypress trees, until, *unbelievable glory* [italics mine], it was actually in my hands. To [William] Brewster's intense disgust, I made a skeleton of it—the only one in the Museum. I never met with this species again.

Chapman went on to organize expeditions to several Latin American countries, during which tens of thousands of specimens were collected. His own collecting began in Florida, Mexico, and Trinidad in the last two decades of the 19th century, and continued in Colombia, Ecuador, and Peru in the first two decades of the 20th century. In addition to collecting, Chapman watched the behavior of birds. His papers on life histories (Chapman 1905, 1928c, 1935) demonstrated his observational skills. In his books on Barro Colorado (Chapman 1929a, 1938), furthermore, he showed that he was interested in his subjects as individuals (Chapman 1938:101–115), not just as members of species:

> I speak of an individual…*Pheugopedius fasciatoventris albigularis* [=*Thryothorus fasciatoventris albigularis*, the Black-bellied Wren], to give him his full technical designation, is not only a songster of exceptional ability, but he appears also to be a composer whose gifts, as far as I know, are unsurpassed in the world of birds.

In addition to Chapman the collector and Chapman the field observer, there was Chapman the conservationist. In 1899, eleven years after starting work at the AMNH, he founded *Bird-Lore* ("An Illustrated Bi-Monthly Magazine Devoted to the Study and Protection of Birds" and the "Official Organ of the Audubon Societies"), which became *Audubon Magazine* in 1941. As its editor for 35 years (1899–1934), he published many notes on conservation topics. As a participant on the conservation committee of the AOU, following the lead of Joel Allen, Chapman used another forum to defend the cause of conservation.

How could a man who collected birds with such pleasure also be a passionate conservationist? Supposedly, his epiphany came when, taking a walk in New York City, he was shocked by the number of bird species decorating the hats of fashionable women, but this may be part of a myth he built himself. In fact, he did not really change, over time, from a collector to a conservationist. Throughout his career, Chapman the collector was always simultaneously Chapman the conservationist. There was probably no contradiction in his mind. A collector could also be a conservationist. Indeed, a good collector (and a good systematist and biogeographer) makes a more informed and, hence, more convincing conservationist.

Chapman: Systematist and Biogeographer

Chapman the systematist.—Chapman published many papers on the taxonomy of South American birds in the AMNH *Bulletin* or *Novitates*. Many of those papers, entitled "Descriptions of proposed new birds from [Colombia, etc.]," contain diagnoses of new species, new subspecies, and new genera. Occasionally, Chapman refrained from describing new taxa because the comparative material at his disposal was insufficient. Instead, he suggested the possibility of as-yet-undescribed forms. Several new species and subspecies later named in his honor were, in fact, based on his suggestions.

More than 320 subspecies and about 57 species described by Chapman have stood the test of time (compiled from Dickinson 2003). Several of his species remained poorly known for many years. Thus, the Tumaco Seedeater (*Sporophila insulata*; Chapman 1921:12), described on the basis of four specimens, was rediscovered only about 10 years ago (Salaman 1995). The biology of Watkins's Antpitta (*Grallaria watkinsi*; Chapman 1919:255–256), described on the basis of seven specimens, and the Peruvian Antpitta (*Grallaricula peruviana*; Chapman 1923b:11–12), described on the basis of two specimens, remained practically unknown until last year (Greeney et al. 2004a, b; Martin and Dobbs 2004). Illustrations often accompanied Chapman's descriptions. For example, Louis Agassiz Fuertes painted beautiful color plates showing the Indigo-winged Parrot (*Hapalopsittaca fuertesi*) and the Moustached Antpitta (*Grallaria alleni*) (Chapman 1917: plates 37 and 39), the White-necked Parakeet (*Pyrrhura albipectus*), Watkins's Antpitta, and the Henna-hooded Foliage-gleaner (*Hylocryptus erythrocephalus*) (Chapman 1926: plates 25, 27, and 28).

Chapman's descriptions include a diagnosis, mention of a type specimen with locality and date of collection, name of the collector, the description itself, and a list of specimens examined. To Chapman, properly identified study skins were the fundamental objects upon which the systematic edifice could be built. He believed it was crucial to have collected many specimens himself and to have visited their areas of origin. Fieldwork was a *sine qua non* condition of Chapman's systematic research. Subsequent museum work was essential for making sense of the taxonomic placement of the assembled specimens. Only after that double approach could one speculate about distributional histories (Chapman 1933:208–209):

> …the work of the collector in securing specimens must be supplemented by that of the systematist in identifying them. I have found that in "working up" a collection representing a fauna with which I am fairly familiar, I average about a species a day. Some specimens may be named at sight, though comparison with other specimens of the same species is always necessary to learn the extent, if any, of the bird's variations, in color, size or proportions.

He wrote these lines in reference to the "Colombian collection of approximately twelve hundred species," and could have said the same about the equally rich Ecuadorian avifauna. Ornithologists who now work in Colombia or Ecuador take for granted such field guides as those of Hilty and Brown (1986) and Ridgely and Greenfield (2001a, b). They may not realize that those modern volumes could never have been produced without the fundamental information provided by the immense body of field and museum work carried out decades earlier by Chapman and his collectors.

Chapman (1933:69) was conservative in his approach to taxonomy and nomenclature:

> In [the] pursuit [of "untangling the affinities of a complex group of species"] I have avoided, as far as possible, all attempts to overturn existing nomenclature and have been content to employ names which left no doubt of the identity of the specimen to which they were attached.

Only a few of Chapman's numerous taxonomic papers go beyond alpha taxonomy. Here and there, tucked away in pieces with general titles, one discovers nuggets of information about phylogenetic relationships, biogeographic history, or other more general topics. In fewer papers still, Chapman speculated on evolutionary questions (Chapman 1923a, 1928a, 1940). Those speculations reveal that although he was a first-rate field and museum man, Chapman was not very conversant with evolutionary theory.

Indeed, Chapman was not really interested in theory. Did he nevertheless have philosophical views about the concepts of genus, species, and subspecies or about speciation? He remained largely silent, at least in print, on such topics, though in one paper (Chapman 1924), he expounded his views on criteria for subspecies. His descriptions of genera, species, and subspecies are based largely on measurements, proportions, and external plumage characteristics (color and pattern). It is a pity that he did not use (or publish more about) vocalizations or habitat preferences, because he was familiar with many species in the field. Chapman considered systematics as a means to an end, not an end in itself. The end—the reward—was biogeography.

Chapman the biogeographer.—Writing about Andean birds, Chapman (1933:207–208) stated:

> It is…obvious that in a study of the origin of life in the Andes we can associate cause and effect

> far more frequently than in those continental areas the early pages of whose geological and biological history are lost in an incalculably remote past. One asks, therefore, what are the factors that determine with such clearness the boundaries of these Andean life-zones?

Chapman's interest in Merriam's North American life-zones led him to search for their counterparts in the Venezuelan tepuis and the Andes (Chapman 1917, 1921, 1926, 1931, 1939). Whether or not one subscribes to the concept of life-zones, those five monographs are major contributions to the biogeography of South American birds.

Chapman asked specific, important, and still valid questions (Chapman 1926:43) about the origins of Andean birds:

> …how has the distribution of birds been affected by the elevation [=uplift] of the Andes? …is the bird-life of humid western Ecuador pre- or post-Andean [uplift] or both? If post-Andean in whole or in part, whence has it been derived? What are Amazonian elements? What are Central American elements? Which are the stronger? Which are the older? What are the endemic elements?

The term "faunal element" became much more widely used in later years. Part of his approach to understanding the derivation of Andean birds was to analyze discontinuous ranges. He gave many examples of them, with maps, in his monographs on Colombian and Ecuadorian birds. That he considered range discontinuities to be real and not an artifact of insufficient collecting and exploration is clear (Chapman 1926:117):

> We have now reached a stage in our study of Andean bird-life when, in some instances at least, we may venture to assert that a species does not occur in a stated area. Such cases of discontinuous distribution occur chiefly in the upper life-zones. They are of much significance and demand consideration.

This quotation also makes it evident that Chapman associated the occurrence of latitudinal range discontinuities with the vertical distribution of life-zones. He concluded that discontinuity patterns resulted from ecological and geological barriers at high elevations, attributable mostly to the effects of glaciation and volcanism. Many bird species, especially those living in tropical forests, are quite sedentary. Therefore, discontinuities in their present ranges are signatures reflecting the influence of events long past. Unfortunately, Chapman did not suggest explicit hypotheses about those events and their timing. It remained for the much younger Mayr—who, unlike his department chairman, was very interested in theory—to elucidate the role of geographic isolation in speciation. Chapman never really came to grips with speciation in South American birds. That topic has attracted the attention of subsequent ornithologists (e.g. Haffer 1974). All students who today investigate the biogeography of Andean birds follow in Chapman's footsteps, whether they recognize it or not.

Chapman and Barro Colorado Island

Chapman loved Barro Colorado Island: "Barro Colorado is healthful," "Barro Colorado is comfortable,"and "Barro Colorado is accessible." This artificial island in Gatun Lake (in the Panama Canal Zone in Chapman's days, now in the Republic of Panamá) is a unique place for the study of lowland tropical rainforest fauna and flora. Every time Chapman went there, he felt that he had completely left New York City and the American Museum behind. He was therefore totally free to study the birds, mammals, and other creatures of this tropical paradise: "Time as a governing element has ceased to exist and the future is only an exhaustless reservoir of a joyous present" (Chapman 1938:13). Barro Colorado Island (BCI) has since become one of the best-studied patches of Neotropical rainforest. The recent book by Royte (2001) gives a wonderful flavor of current research projects there (and presents lively vignettes of the scientists who pursue them).

After sailing from New York City on a slow steamer, Chapman made himself at home on the island. His six cameras—a Graphic, a Graflex, a Kodak, a Leica, an Eymo, and a Nesbit—would join his three binoculars—of 24×, 8×, and 6× power—and books by Wallace, Bates, Darwin, and Belt on adjacent shelves. Chapman would then settle into a routine of observation, notetaking, photography, reading, and contemplation (Fig. 1). Chapman spent several months (December–April) for 12 consecutive seasons (1925–1937) on Barro Colorado Island. His

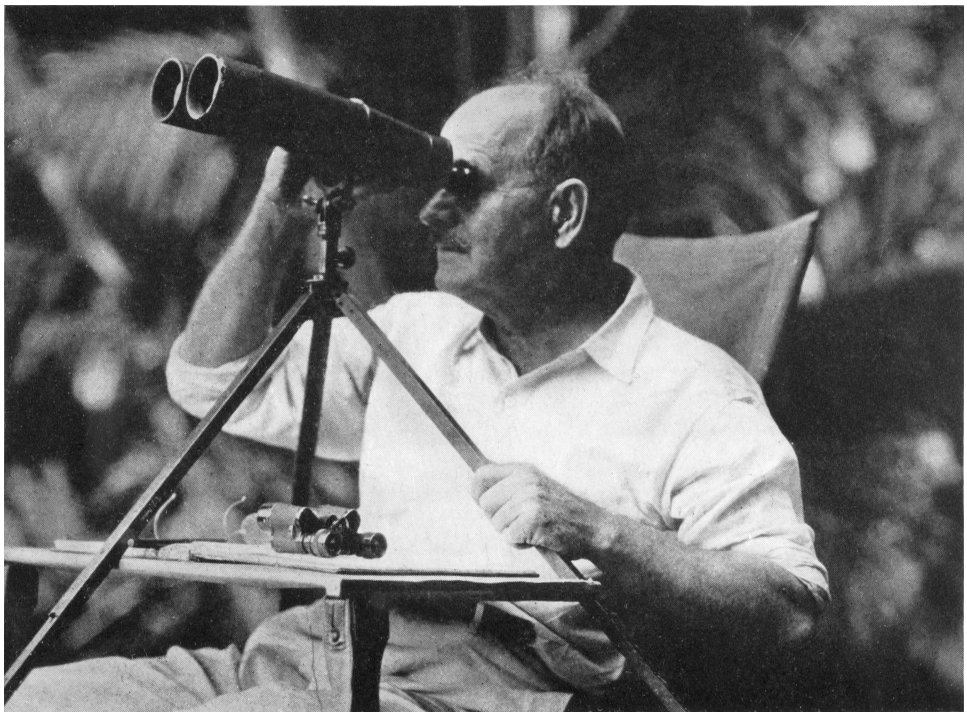


FIG. 1. Frank M. Chapman studying Chestnut-headed Oropendolas (*Psarocolius wagleri)* on Barro Colorado Island, Panama, circa 1927 (from Chapman 1931; plate facing page 83; photographed by F. E. Lutz). "My observation-post was the open space beneath my house, situated about 100 yards from the Oropéndolas' tree and fifty feet below the average nest-level. Seated in a camp-chair … and using a 24-power binocular mounted on a tripod, the birds, wholly unaware of my presence, seemed to be within reach of my hand." The small glass on the table is probably a Carl Zeiss Jena Turex or Turexem, 6 × 21, an instrument manufactured between 1914 and 1920. Identification of the big 24× glass is more problematic. Zeiss made a 24 × 60 spotting scope, the Asiola, in the 1930s. Zeiss also manufactured a binocular version, the Asiolabi, also 24 × 60, one of the rarest of all Zeiss glasses.

books *My Tropical Air Castle* (1929) and *Life in an Air Castle* (1938) are great reads. I especially like the description of his experiments on the discovery of food by olfaction in Turkey Vultures (*Cathartes aura*) and his attempts to prevent coatis (*Nasua narica*) from reaching food attached to a piece of rope. While on BCI, Chapman took photographs, by trip-wires, of shy, nocturnal mammals like ocelot (*Felis pardalis*), puma (*Felis concolor*), and tapir (*Tapirus bairdii*) (see, for example, the extraordinary plate of a tapir dripping water from its nose, opposite page 229 in *My Tropical Air Castle*.) Chapman's lists of species on BCI from the 1920s to the 1930s served as basic surveys for later work (Eisenmann 1952, Willis and Eisenmann 1979), which in turn led to considerations about conservation (Wilson and Willis 1975).

The Chapman Fund

The Frank M. Chapman Memorial Fund of the AMNH is the most important fund, anywhere in the world, devoted exclusively to helping ornithologists, especially young students, with financial grants. Elsie Naumburg created the Fund, through an initial donation of $5,000, on 12 December 1945. The income from the money was to be used "as a memorial to Dr. Frank M. Chapman." The trustees of the AMNH accepted the gift on 24 January 1946. After her death on 25 November 1953, the proceeds from her estate, more than $1,000,000, went to the Chapman Fund. In the mid-1990s, the Fund's market value was about $4,000,000 (Lanyon 1995). In 2005, 60 years after Chapman's death, it is more than $8,000,000.

Since the first five grants in 1951 (for a total of $1,950), awards have been made each year. During this 55-year period, the Chapman Fund has helped more than 1,000 ornithologists, mostly beginning professionals. In 2005, the Chapman Committee received and reviewed 112 grant proposals in systematics and evolution, community ecology, behavioral ecology, physiology and endocrinology, conservation biology, population biology, behavior, habitat ecology, spatial ecology, and monitoring. The number of awards and their total dollar value have varied over the years. For example, 93 awards were made in 1980 for $41,913 with a mean of $451 (Auk 98:126, 144, 158), 51 in 1985 for $25,482 with a mean of $499 (Auk 103:13, 22), and 43 in 1990 for $23,655 with a mean of $550 (Auk 108:113). Most issues of *The Auk* contain one or two articles acknowledging financial support from the Chapman Fund. In addition to the small grants program, the postdoctoral fellowship program of the Chapman Fund awards one or two fellowships (or none, when there have been no proposals of sufficient scientific merit) in a given year. Over the years, the fellowship program has allowed dozens of postdoctoral fellows to spend a year or more at the American Museum. Many of them have also spent time in the field. Former Chapman Postdoctoral Fellows have pursued successful university, museum, or conservation careers in ornithology in the United States and abroad.

The Frank M. Chapman Memorial Fund consists of a Full Committee and a Sub-Committee, the members of which have expertise in the fields of behavior and ecology, biostatistics, conservation, DNA sequencing, evolution, morphology, physiology, and systematics. Sub-Committee members include Joel Cracraft (chairman), George Barrowclough, Alan Brush, Robert Rockwell, and François Vuilleumier. Each member of the Sub-Committee reads all grant proposals sent to the bird department each year and evaluates them independently. Some members have served for 30 years or more, thus insuring a great degree of continuity in the approach to funding and in the service to the ornithological community at large. After rating each proposal, the Sub-Committee members discuss their reviews prior to making recommendations to the Full Committee, which convenes in March of each year. In addition to the five members of the Sub-Committee, the Full Committee includes one member of an AMNH department other than ornithology, one trustee, the provost, and, as a guest, the grants administrator.

Ornithologists who receive an award from the Frank M. Chapman Memorial Fund today must remember that it was Chapman's inspiration that attracted Elsie Naumburg to his department in the first place, and that it was his leadership and friendship that led her to create a fund in his memory. Any future history of ornithology in North America will have to take into account the extraordinary role the Chapman Fund has played in the development of ornithology. An analysis of this contribution remains to be conducted.

Summary and Conclusions

Chapman's considerable influence on ornithology when he was alive has left legacies that can be traced to this day. His *Handbook of the Birds of Eastern North America* and other books inspired later field guides; his involvement in conservation through the journal *Bird-Lore* (later *Audubon Magazine*) has left a permanent mark; his research on the faunas of the Andes and tabletop mountains of Venezuela has led to ongoing investigations; his popular writing and lectures have stimulated thousands of amateur naturalists; and his involvement with museum exhibit techniques that represent birds in their natural environment led to the wide use of dioramas. These and other activities, not the least of which was Chapman's ability to surround himself with brilliant men and women, whose work and thought, collectively, have made the Museum a focus of intellectual life in American and world ornithology, all show that Chapman was a truly remarkable individual, whose full mark on ornithology remains to be documented. Elizabeth S. Austin made a good start in her 1967 book, *Frank M. Chapman in Florida: His Journals and Letters*, which provides invaluable information about his early career. Further research on Chapman's life and work after Florida will have to include the rich material in the AMNH archives.

Acknowledgments

The author, Curator in the Department of Ornithology at the AMNH, was a Frank M. Chapman Postdoctoral Fellow in 1967–1968, joined the department as a permanent staff member in 1974, and was its chairman from 1987 to

1992. This piece was written on the occasion of the 60th anniversary of Frank M. Chapman's death. I thank M. LeCroy and A. V. Andors for invaluable biographical and bibliographic information, and L. J. Gubas of the Zeiss Historica Society for assistance in identifying the binoculars used by Chapman (Fig. 1). I am grateful to B. G. Murray, Jr., and J. G. Tello for reading the manuscript critically and making suggestions for its improvement. Craig Chesek of the AMNH Photo Studio kindly scanned Figure 1 from Chapman (1931). My Andean fieldwork in regions that Chapman had visited was made possible by the Chapman Fund (prior to my joining the AMNH as a staff member), the National Science Foundation, the National Geographic Society, the Sanford Fund, and the Patricia Stryker Joseph Fund. To paraphrase R. Moreau, I have enjoyed, and I mean enjoyed, my three decades at the AMNH in the shadow of the dean of American ornithologists.

Literature Cited

Allen, J. A. 1916. Autobiographical Notes and a Bibliography of the Scientific Publications of Joel Asaph Allen. American Museum of Natural History, New York.

Amadon, D. 1974. In memoriam: Robert Cushman Murphy April 29, 1887–March 20, 1973. Auk 91:1–9.

Austin, E. S. 1967. Frank M. Chapman in Florida: His Journals and Letters. University of Florida Press, Gainsville.

Bock, W. J. 2004. Ernst Mayr at 100: A life inside and outside of ornithology. Auk 121: 637–651.

Chapin, J. P. 1932a. In memoriam: Waldron DeWitt Miller, 1879–1929. Auk 49:1–8.

Chapin, J. P. 1932b. The birds of the Belgian Congo. Part 1. Bulletin of the American Museum of Natural History 65:1–756.

Chapin, J. P. 1939. The birds of the Belgian Congo. Part 2. Bulletin of the American Museum of Natural History 75:1–632.

Chapin, J. P. 1953. The birds of the Belgian Congo. Part 3. Bulletin of the American Museum of Natural History 75A:1–821.

Chapin, J. P. 1954. The birds of the Belgian Congo. Part 4. Bulletin of the American Museum of Natural History 75B:1–846.

Chapman, F. M. 1895. Handbook of Birds of Eastern North America. D. Appleton and Company, New York.

Chapman, F. M. 1902. Natural history for the masses. World's Work November 1902: 2761–2770.

Chapman, F. M. 1905. A contribution to the life-history of the American Flamingo (*Phoenicopterus ruber*), with remarks upon specimens. Bulletin of the American Museum of Natural History 21:53–77.

Chapman, F. M. 1917. The distribution of birdlife in Colombia. Bulletin of the American Museum of Natural History 36:1–729.

Chapman, F. M. 1919. Descriptions of proposed new birds from Peru, Bolivia, Brazil, and Colombia. Proceedings of the Biological Society of Washington 32:253–268.

Chapman, F. M. 1921. The distribution of bird life in the Urubamba Valley of Peru. Bulletin of the United States National Museum 117:1–138.

Chapman, F. M. 1922a. In memoriam: Joel Asaph Allen. Auk 39:1–14.

Chapman, F. M. 1922b. The Department of Birds, American Museum, its history and aims. Natural History 22:306–318.

Chapman, F. M. 1923a. The distribution of the motmots of the genus *Momotus*. Bulletin of the American Museum of Natural History 48:26–59.

Chapman, F. M. 1923b. Descriptions of proposed new birds from Venezuela, Colombia, Ecuador, Peru, and Chile. American Museum Novitates 96:1–12.

Chapman, F. M. 1924. Criteria for the determination of subspecies in systematic ornithology. Auk 41:17–29.

Chapman, F. M. 1926. The distribution of birdlife in Ecuador. Bulletin of the American Museum of Natural History 55:1–784.

Chapman, F. M. 1927. Biographical memoir Joel Asaph Allen 1838–1921. Memoirs of the National Academy of Sciences 21:1–20.

Chapman, F. M. 1928a. Mutation in *Capito auratus*. American Museum Novitates 335:1–21.

Chapman, F. M. 1928b. In memoriam: Louis Agassiz Fuertes 1874–1927. Auk 45:1–26.

Chapman, F. M. 1928c. The nesting habits of Wagler's Oropendola (*Zarhynchus wagleri*) on Barro Colorado Island. Bulletin of the American Museum of Natural History 58: 123–166.

Chapman, F. M. 1929a. My Tropical Air Castle: Nature Studies in Panama. D. Appleton and Company, New York.

Chapman, F. M. 1929b. Descriptions of new birds from Mt. Duida, Venezuela. American Museum Novitates 380:1–27.

Chapman, F. M. 1931. The upper zonal bird-life of Mts. Roraima and Duida. Bulletin of the American Museum of Natural History 63: 1–135.

Chapman, F. M. 1933. Autobiography of a Bird-Lover. D. Appleton-Century Company, New York.

Chapman, F. M. 1935. The courtship of Gould's Manakin (*Manacus manacus vitellinus*) on Barro Colorado Island, Canal Zone. Bulletin of the American Museum of Natural History 68:471–525.

Chapman, F. M. 1938. Life in an Air-Castle: Nature Study in the Tropics. D. Appleton-Century Company, New York.

Chapman, F. M. 1939. The upper zonal birds of Mt. Auyan-Tepui, Venezuela. American Museum Novitates 1051:1–15.

Chapman, F. M. 1940. The post-glacial history of *Zonotrichia capensis*. Bulletin of the American Museum of Natural History 77:381–438.

Davis, W. E., Jr. 1994. Dean of the Birdwatchers. A Bibliography of Ludlow Griscom. Smithsonian Institution Press, Washington, D.C.

Dickinson, E. C., Ed. 2003. The Howard and Moore Complete Checklist of the Birds of the World, 3rd ed. Christopher Helm, London.

Dwight, J., Jr. 1900. The sequence of plumages and moults of the passerine birds of New York. Annals of the New York Academy of Sciences 3:73–360.

Dwight, J., Jr. 1925. The gulls of the world. Bulletin of the American Museum of Natural History 52:63–401.

Eisenmann, E. 1952. Annotated list of birds of Barro Colorado Island, Panama Canal Zone. Smithsonian Miscellaneous Collection 117(5):1–62.

Fleming, J. H. 1930. In memoriam: Jonathan Dwight. Auk 47:1–6.

Friedmann, H. 1966. In memoriam: James Paul Chapin. Auk 83:240–252.

Gilliard, E. T. 1940. Descriptions of seven new birds from Venezuela. American Museum Novitates 1091:1–13.

Gilliard, E. T. 1942. The Cordillera Macarena, Colombia. Geographical Review 32:463–470.

Greeney, H. F., R. A. Gelis, E. C. Hannelly, and P. J. DeVries. 2004a. The egg and incubation period of the Peruvian Antpitta (*Grallaricula peruviana*). Ornitologia Neotropical 15: 403–406.

Greeney, H. F., E. C. Hannelly, and M. Lysinger. 2004b. First description of the nest and vocalization of the Peruvian Antpitta *Grallaricula peruviana* with a northward range extension. Cotinga 21:14–17.

Gregory, W. K. 1949. Biographical memoir of Frank Michler Chapman, 1864–1945. Biographical Memoirs of the National Academy of Sciences 35:111–145.

Griscom, L. 1932. The distribution of bird-life in Guatemala. A contribution to a study of the origin of Central American bird-life. Bulletin of the American Museum of Natural History 64:1–439.

Griscom, L. 1935. The ornithology of the Republic of Panama. Bulletin of the Museum of Comparative Zoology 78:261–382.

Haffer, J. 1974. Avian speciation in tropical South America. Publications of the Nuttall Ornithological Club, no. 14.

Haffer, J. 1995. Ernst Mayr als Ornithologe, Systematiker, und Zoogeograph. Biologisches Zentralblatt 114:133–142.

Harlow, A. F. 1936. Henry Payne Whitney. Dictionary of American Biography 20: 160–161.

Hellmayr, C. E. 1907. [Two new spine-tailed swifts from South America.] Bulletin of the British Ornithologists' Club 19:62–63.

Hilty, S. L., and W. L. Brown. 1986. A Guide to the Birds of Colombia. Princeton University Press, Princeton, New Jersey.

Howell, S. N. G., and S. Webb. 1995. A Guide to the Birds of Mexico and Northern Central America. Oxford University Press, New York.

Lanyon, W. E. 1995. Ornithology at the American Museum of Natural History. Pages 113–144 *in* Contributions to the History of North American Ornithology (W. E. Davis, Jr., and J. A. Jackson, Eds.). Memoirs of the Nuttall Ornithological Club, no. 12.

LeCroy, M. 1989. A wing for the birds. Natural History 98:90–91.

LeCroy, M. 1997. Naumburg, Elsie Margaret Binger (1880–1953). Pages 986–987 *in* Jewish Women in America: An Historical Encyclopedia (P. E. Moore and D. D. Moore, Eds.). Routledge, New York.

Martin, P. R., and R. C. Dobbs. 2004. Description of the nest, egg and nestling of Watkin's Antpitta *Grallaria watkinsi*. Cotinga 21:35–37.

Mayr, E., and A. L. Rand. 1937. Results of the Archbold Expeditions. 14. Birds of the 1933–1934 Papuan expedition. Bulletin of the American Museum of Natural History 73:1–248.

Miller, W. DeW. 1912. A revision of the classification of the kingfishers. Bulletin of the American Museum of Natural History 31: 239–311.

Miller, W. DeW. 1915. Notes on ptilosis, with special reference to the feathering of the wing. Bulletin of the American Museum of Natural History 34:129–140.

Miller, W. DeW. 1924. Variations in the structure of the aftershaft and their taxonomic value. American Museum Novitates 140:1–7.

Murphy, R. C. 1923. The oceanography of the Peruvian littoral with reference to the abundance and distribution of marine life. Geographical Review 13:64–85.

Murphy, R. C. 1932. Moving a museum. Natural History 39:497–511.

Murphy, R. C. 1936. Oceanic Birds of South America, 2 vols. American Museum of Natural History, New York.

Murphy, R. C. 1947. Logbook for Grace. The Macmillan Company, New York.

Murphy, R. C. 1950. Frank Michler Chapman, 1864–1945. Auk 67:307–315.

Murphy, R. C. 1951. [Obituary of Leonard Cutler Sanford.] Auk 68:409–410.

Murphy, R. C., and D. Amadon. 1959. In memoriam: John Todd Zimmer. Auk 76:418–423.

Murphy, R. C., and D. Amadon. 1966. In memoriam: E. Thomas Gilliard. Auk 83:416–422.

Naumburg, E. M. B. 1930. The birds of Matto Grosso, Brazil. Bulletin of the American Museum of Natural History 60:1–432.

Naumburg, 1935. Gazetteer and maps showing stations visited by Emil Kaempfer in eastern Brazil and Paraguay. Bulletin of the American Museum of Natural History 68: 449–469.

Palmer, T. S. 1950. [Obituary of Fannie Miller Bates.] Auk 67:143.

Rand, A. L. 1936. The distribution and habits of Madagascar birds. Bulletin of the American Museum of Natural History 72:143–499.

Ridgely, R. S., and P. J. Greenfield. 2001a. The Birds of Ecuador, vol. I: Status, Distribution, and Taxonomy. Cornell University Press, Ithaca, New York.

Ridgely, R. S., and P. J. Greenfield. 2001b. The Birds of Ecuador, vol. II: Field Guide. Cornell University Press, Ithaca, New York.

Ridgely, R. S., and G. Tudor. 1989. The Birds of South America, vol. I: The Oscine Passerines. University of Texas Press, Austin.

Ridgely, R. S., and G. Tudor. 1994. The Birds of South America, vol. II: The Suboscine Passerines. University of Texas Press, Austin.

Rothschild, M. 1983. Dear Lord Rothschild: Birds, Butterflies and History. Balaban, Philadelphia.

Royte, E. 2001. The Tapir's Morning Bath. Houghton Mifflin Company, Boston.

Salaman, P. G. W. 1995. The rediscovery of Tumaco Seedeater *Sporophila insulata*. Cotinga 4:33–35.

Thompson, C. W., and A. L. Kitaysky. 2004. Polymorphic flight-feather molt sequence in Tufted Puffins (*Fratercula cirrhata*): A rare phenomenon in birds. Auk 121:35–45.

Traylor, M. A., D. Amadon, and W. E. Godfrey. 1984. In memoriam: Austin L. Rand. Auk 101:600–602.

Willis, E. O., and E. Eisenmann. 1979. A revised list of birds of Barro Colorado Island Panama. Smithsonian Contributions to Zoology 291:1–31.

Wilson, E. O., and E. O. Willis. 1975. Applied biogeography. Pages 522–534 *in* Ecology and Evolution of Communities (M. L. Cody and J. M. Diamond, Eds.). Belknap Press of Harvard University Press, Cambridge, Massachusetts.

Zimmer, J. T. 1931. Studies of Peruvian birds. I. New and other birds from Peru, Ecuador, and Brazil. American Museum Novitates 500:1–23.

Zimmer, J. T. 1946. Frank Michler Chapman. American Naturalist 80:476–481.

Zimmer, J. T. 1955. In memoriam: Elsie Margaret Binger Naumburg. Auk 72:265–266.