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## NOTES ON THE BRAZILIAN MERGANSER IN ARGENTINA

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WHILE on ornithological field trips in the Province of Misiones (Argentina) between 1949 and 1954, I was able to gather a few notes on the habits of the rare Brazilian Merganser (*Mergus octosetaceus*). On these trips, sponsored by the Buenos Aires Natural History Museum, our main purpose was to collect specimens and data for a complete analysis of the avifauna of the region; some extra time was devoted to this species, because of its rarity. So little is known about this merganser, that my observations, along with a summary of our present knowledge of the species, may be of some interest to ornithologists.

This curious duck, the only South American merganser, was first described by Vieillot in 1817 (Nouv. Dict. Hist. Nat. nouv. ed., 14, p. 222), probably from specimens taken in Brazil by Delalande (Berlioz, 1929: 68-89). Since then it has been reported on only a few occasions. It was found in Brazil by Natterer during his travels between 1817 and 1835 on the Rio Itararé, São Paulo, and at Guarda-Mór, Minas Gerais (Pelzeln, 1868-70: 322). Friedrich Sellow secured specimens of the Brazilian Merganser during his travels (1818 and 1819) in Rio de Janeiro, Minas Gerais, and São Paulo. Although these specimens (now in the Berlin Museum) are simply labelled "Minas," they were probably obtained early in 1819 when the travelers followed the Rio das Velhas down to the Rio São Francisco (Stresemann, *in litt.* April 22, 1952; see also Stresemann, 1935: 121; 1948; and 1954: 52). Burmeister (1856: 442) and Schlüter (cf. Berlepsch, 1874: 281) found the Brazilian Merganser in Santa Catarina; two additional specimens from this state are in the Berlin Museum (Stresemann, 1935: 121; 1954: 52).

In 1903 another specimen was secured in São Paulo (Rio Parapanema) by Hempell (cf. Pinto, 1938: 58). The last specimen known



BRAZILIAN MERGANSERS, from a painting by Don R. Eckelberry

to have been taken in Brazil is mentioned by Sztolcman (1926: 121); it was collected in the state of Paraná (Rio Ivaí, Salto da Ariranha) by Chrostowski in 1922.

According to Bertoni (1901: 8), the Brazilian Merganser also inhabited small streams in Paraguay along the Paraguayan side of the Alto Paraná River drainage.

Up to 1947, only three specimens of the Brazilian Merganser from Argentina were known in museum collections; two of them in the Buenos Aires Museum. The first specimen known to have been collected in Argentina was taken in Arroyo Garuhapé (Misiones) by Ramón Lista in September, 1882. This specimen (unsexed, but probably a male) was mentioned by Lista (1883: 90) in a non-technical report of his travels through Misiones; it was mentioned again by Dabbene (1910: 234; 1914: 297) but without a complete statement of its origin. A second specimen, also taken in Misiones, was given to the Buenos Aires Museum in 1914 along with some mounted birds from a collection owned by Señor Antonio Núñez of Buenos Aires. None of the specimens in this collection has data except for the Brazilian Merganser, and it has an old museum label which was probably attached to the specimen, because of its rarity, after it entered the Museum. F. M. Rodríguez collected the specimen, a female, but no date is given. The locality first written on the label ("Santa Ana, Misiones") was later changed, in different handwriting, to "Saltos de Iguazú" (Iguazú River Falls, Misiones). Because Santa Ana was the headquarters of Rodríguez (a professional collector working at that time for the Buenos Aires Museum), there was probably no hesitation in ascribing that locality to the skin. Later the mistake was discovered, perhaps by Rodríguez himself during one of his visits to the Museum. A description of this specimen, with the first (erroneous) locality attributed to it, is given by Phillips (1926: 302); this description was based on notes taken by the late J. L. Peters during his visit to Argentina in 1920 and 1921.

The third specimen known from Argentina, an adult male, was collected by Johan Mogensen on April 30, 1912, in Bonpland, Misiones (probably collected on the Yavevirí River). It is in the Shipton Collection, Miguel Lillo Institute of Tucumán University (Tucumán, Argentina). See Mogensen (1930: 208).

From 1922 to 1947 nothing more was learned about this duck. In October, 1947, an expedition from the Buenos Aires Museum made a short reconnaissance along the Yacuy River, a small tributary of the Iguazú, in northern Misiones. The party was led by Dr. Eduardo del Ponte, then Chief of the Department of Zoology in the Museum.

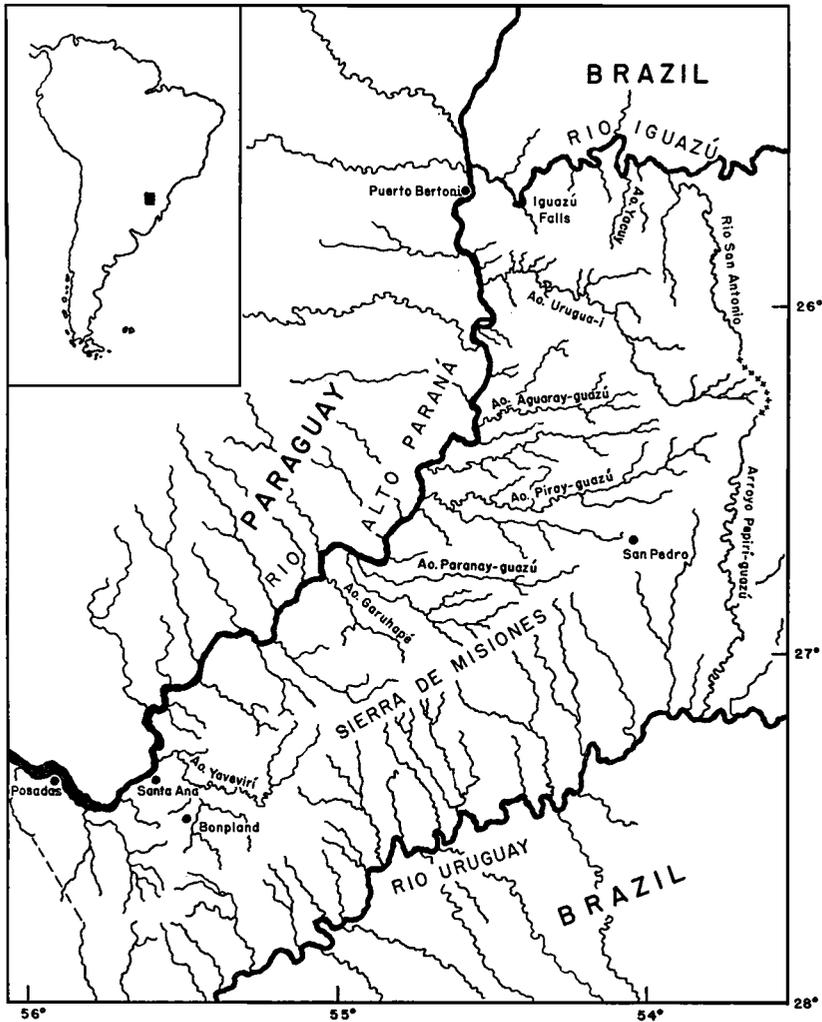


FIGURE 1. Map showing the rivers where the Brazilian Merganser was found in the Province of Misiones, Argentina.

Although the main object of the expedition was to conduct field research on medical entomology, a small collection of birds was made with the assistance of Señor Alberto A. Aiello. Among these birds was a new specimen of the Brazilian Merganser. The reappearance of this species aroused much interest among ornithologists in Buenos Aires. Señor Andrés G. Gai, commissioned by the Buenos Aires Museum, left for Misiones in April, 1948. After five months of

searching along the Arroyo Aguaray-guazú and Arroyo Urugua-i (not to be confused with Rio Uruguay), he collected eight additional specimens of the Brazilian Merganser.

I made my first trip to Misiones in September, 1949, with Señor Gai. We did general collecting along the Arroyo Urugua-i through November and returned to the same locality in January, 1950, remaining there until March. During these two trips we found the merganser along the Arroyo Urugua-i several times. Because of the scarcity of the bird, we limited our collecting to three specimens.

I revisited Misiones twice in 1951 (from January to March and in July and August) and once each in 1952 (from January to March), 1953 (September), and 1954 (from July to December). During these trips I encountered the Brazilian Merganser on several occasions and collected specimens. In August, 1954, the first nest of the species was discovered and three downy young were collected. Other specimens reached the Museum by way of two trained native collectors from Misiones.

A list of the specimens of *Mergus octosetaceus* in the Buenos Aires

<i>Catalog Number</i>	<i>Sex</i>	<i>Locality</i>	<i>Date</i>	<i>Collector</i>
—	♂	Arroyo Garuhapé	Sept., 1882	R. Lista
8521	♀	Rio Iguazú, Saltos	None	F. M. Rodriguez
30603	♀	Arroyo Yacuy	2 Oct., 1947	del Ponte-Aiello
31328	♂	Arroyo Aguaray-guazú	29 May, 1948	A. G. Gai
31329	♂	Arroyo Urugua-i	20 July, 1948	A. G. Gai
31330	♀	Arroyo Urugua-i	22 July, 1948	A. G. Gai
31331	♂	Arroyo Urugua-i	22 July, 1948	A. G. Gai
31332	♀	Arroyo Urugua-i	22 July, 1948	A. G. Gai
31333	♂	Arroyo Urugua-i	28 July, 1948	A. G. Gai
31334	♂	Arroyo Urugua-i	4 Aug., 1948	A. G. Gai
31335	♂	Arroyo Urugua-i	20 Aug., 1948	A. G. Gai
31760	♀	Arroyo Urugua-i	12 Sept., 1949	Gai-Partridge
32367	♂	Arroyo Urugua-i	24 Mar., 1950	Gai-Partridge
32368	♀	Arroyo Urugua-i	24 Mar., 1950	Gai-Partridge
33204	♂	Arroyo Piray-guazú	3 May, 1951	M. Salas
33245	♂	Arroyo Urugua-i	16 Aug., 1951	W. H. Partridge
33246	♀	Arroyo Urugua-i	16 Aug., 1951	W. H. Partridge
33455	♀	Arroyo Urugua-i	14 Mar., 1952	W. H. Partridge
33868	♂	Arroyo Urugua-i	17 May, 1952	M. Salas
33869	♂	Arroyo Urugua-i	18 May, 1952	M. Salas
33902	♀	Arroyo Piray-guazú	25 Aug., 1952	A. Rivas
36576	Young	Arroyo Urugua-i	31 Aug., 1954	W. H. Partridge
36577	Young	Arroyo Urugua-i	31 Aug., 1954	W. H. Partridge
36578	Young	Arroyo Urugua-i	1 Sept., 1954	W. H. Partridge
36579	♀	Arroyo Urugua-i	1 Sept., 1954	W. H. Partridge
36580	♀	Arroyo Urugua-i	12 Dec., 1954	W. H. Partridge

Museum is given on page 476. I have already mentioned some of these specimens in a previous paper (1954: 94) and others have been listed by Gai (1951: 255). All the localities mentioned are in the Province of Misiones, Argentina.

Of the above specimens, No. 31334 has been sent in exchange to the United States National Museum in Washington, D. C. Not mentioned in the above list are a pair collected in Arroyo Piray-guazú and sent to the American Museum of Natural History in New York and a male from the same locality sent to the University of Michigan Museum of Zoology in Ann Arbor.

#### DISTRIBUTION AND STATUS

All the available locality records indicate that the Brazilian Merganser is restricted to southeastern Brazil and the neighboring regions of Paraguay and Argentina.

The species has been reported from the following localities. *Brazil*: Minas Gerais (Guarda-Mór), São Paulo (Rio Itararé and Rio Parapanema), Paraná (Rio Ivaí), and Santa Catarina (Blumenau); *Paraguay*: small streams that flow into the Alto Paraná River; *Argentina*: the Province of Misiones, tributaries of the Alto Paraná (Arroyo Garuhapé, Arroyo Piray-guazú, Arroyo Aguaray-guazú, Arroyo Urugua-i, Rio Iguazú, and its tributary Arroyo Yacuy).

The Brazilian Merganser is undoubtedly a year-round resident in Misiones. The species will probably also prove to be a permanent resident in its range in Paraguay and Brazil.

The following observations lead us to believe that many rivers and streams in Misiones are inhabited by isolated, sedentary populations of the Brazilian Merganser. In Misiones, we have found the species in the same district throughout the year. These ducks are usually seen in pairs, distributed along the rivers, apparently within certain limited areas. Our field observations make it seem unlikely that members of a pair ever abandon their territory; furthermore, they may spend their entire lives along one river or stream. We have found them flying up and down stream very close to the surface of the water and never deviating from the river's course. I have never seen the Brazilian Merganser flying over the forest even along the shore of the river. During our explorations along the rivers we have frequently seen these ducks in flight; they never crossed over into the surrounding forest even after we shot at them from the canoe. When frightened they hurried their flight over us or shifted their flight paths toward a side of the river close to the shady, forested shores. These observations tempt us to believe that it is unlikely that the mergansers move

from one stream to another over large intervening areas of densely forested country. The rivers of Misiones are tributaries of the Paraná, which is the only water connection between them; the Brazilian Merganser has never been found on the Paraná. Even Bertoni, who has lived many years in the Alto Paraná region of Paraguay and is undoubtedly a reliable bird-watcher, has never seen this merganser on the Paraná.

Up to 1947 there were so few records of the Brazilian Merganser that the status of the species was not known; some authors even considered it nearly, if not already extinct (Phillips, 1929: 534). There were several unsuccessful attempts, prior to 1947, to find the species. F. M. Rodriguez of Misiones, who for many years has collected birds for the Buenos Aires Natural History Museum, was asked to secure new specimens; but he failed to find the species (Hornero, 5: 233, 1933). Other unsuccessful attempts were made by the late J. L. Peters and H. B. Conover, who visited Misiones in search of the merganser and failed to find it (Phillips, 1926: 302).

There has been much ornithological work in the extensive area supposed to be inhabited by this duck in Brazil. Recently the Departamento de Zoologia (formerly Museu Paulista) of São Paulo, Brazil, has been thoroughly exploring much of southeastern Brazil, but there are no new records of the Brazilian Merganser from that region. Probably the most exhaustive collecting trip to southeastern Brazil was the one conducted by Emil Kaempfer, 1926 through 1931, for the American Museum of Natural History, New York (Naumburg, 1935). During his five years in the region, Kaempfer sent about 10,000 specimens of birds to the American Museum, but no Brazilian Merganser was among them.

I am not sure that this merganser is as rare in Brazil as the above facts suggest; light may be shed on the problem by our own discovery of the Brazilian Merganser in Misiones where it inhabits nearly all the tributaries of the Paraná, mostly small, that we have explored. From our experience in Misiones, we have learned that this species is found only along the small rivers and streams that run down from the highlands in the interior of the province and into the Alto Paraná. A thorough search along the many tributaries on the western side of the Paraná drainage in Paraguay will probably reveal that the Brazilian Merganser has a similar status in that area.

Protection of the Brazilian Merganser is at present no problem as man is not a serious threat to the species. Native settlers will not hunt the mergansers because of their unpalatability, and sportsmen will never enter wild and unhealthy regions after a scarce bird of no importance as game.

## HABITAT

The Province of Misiones is a narrow district between the Paraná and Uruguay rivers. It is similar in nature to the neighboring states of Paraná and Santa Catarina in Brazil and to the Alto Paraná region in eastern Paraguay. In a faunistic sense, the whole area comprises the southern portion of the extensive highland region of eastern Brazil. Misiones is mainly tropical in climate and has an annual average rainfall of nearly 2,000 millimeters.

The tropical pine forest of southeastern Brazil, which extends over the states of São Paulo, Paraná, Santa Catarina, and part of Rio Grande do Sul, enters Argentina in a very limited area in northeastern Misiones where it grows in the highlands of the Sierra de Misiones. An outstanding feature of this forest is the handsome Brazilian Pine (*Araucaria angustifolia*), which grows in association with the Paraguayan Tea or "Yerba Mate" (*Ilex paraguayensis*). Toward the west, elevations are lower and the pine forest gives way to a more compact and homogeneous humid forest zone which occurs all along the Paraná River in Misiones, eastern Paraguay, and southern Brazil. In the midst of this magnificent tropical forest are those small rivers and streams where I became acquainted with the Brazilian Merganser.

In Misiones, the Sierra de Misiones, 500 to 700 meters in elevation, form a divide about midway between the Paraná and Uruguay rivers; to the eastward the watershed flows into the Uruguay and to the westward into the Paraná. The tributaries of the Paraná (Alto Paraná) are in general larger than those of the Uruguay. Along the west side of Misiones, from Posadas (capital of Misiones) northward to the Iguazú River, which is the boundary between Argentina and Brazil, there are many small streams and rivers flowing into the Paraná, the two largest being the Arroyo Piray-guazú and Arroyo Urugua-i. Most of these small rivers are probably inhabited by the Brazilian Merganser, and all the northern ones which we have explored are.

We are most familiar with the Urugua-i River, largest of all the tributaries of the Paraná. It flows from southeast to northwest for about 100 kilometers and crosses the whole province of Misiones from its eastern border to the Paraná River on the west. Starting near the Brazilian border as several small streams which later unite, the Urugua-i flows along a sinuous course through a region of gently rolling country. Many tributaries increase its volume, and it becomes a rather wide river, reaching in certain places a width of about 200 meters.

The rolling character of the country and the rocky nature of the river bed make the Urugua-i and the other tributaries of the Paraná

very wild; progress along the Urugua-i can be difficult because of the many rapids and small cataracts through which a canoe can be passed only by pulling it around boulders and battling the rushing current. The whole length of the Urugua-i is a continuous succession of stretches of quiet water and stretches of rapids and small waterfalls.

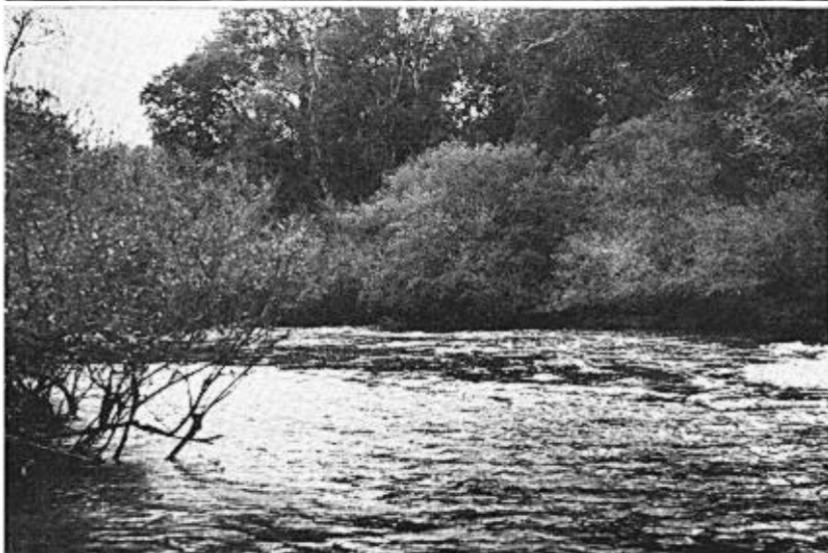
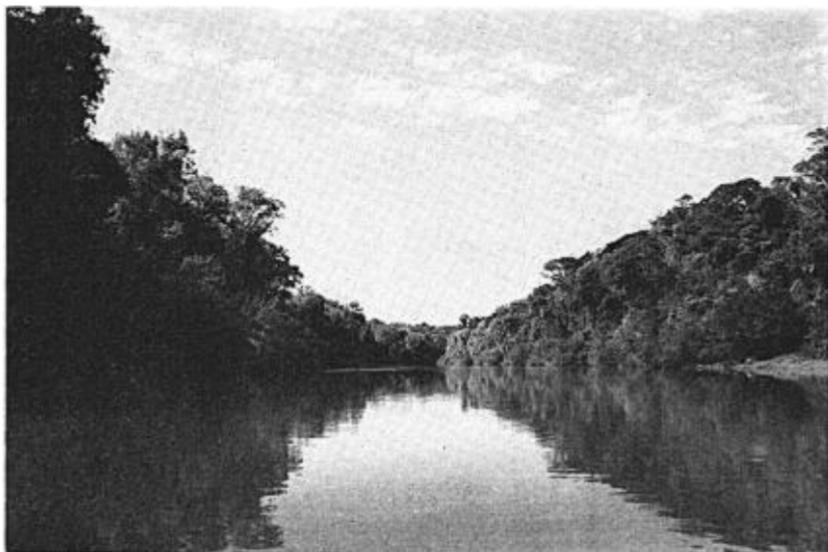
In the rainy season, heavy rains, sometimes lasting several days, raise the water level of the Urugua-i River so much that in a few hours it reaches the topmost part of the banks four or five meters up, and a powerful current sweeps along heavy trees and broken branches which will be left scattered about when the flood is over. During flood the river water becomes muddy, but in a few days it recovers its wonderful transparency, one of the outstanding features of all the Misiones rivers.

The Brazilian Merganser seems to find the proper habitat conditions on the tributaries of the Paraná, wild streams that flow through luxuriant tropical forest. All of these tributaries pass over waterfalls, which vary in size with the size of the tributary, before flowing into the Paraná. No migratory fishes incapable of passing over these waterfalls are above them. This is true of the Dorado (*Salminus maxillosus*), one of the most voracious fishes in the Alto Paraná River and a dangerous enemy to the downy young of any duck in its range. It is possibly of significance that the populations of Brazilian Merganser in Misiones have as their habitat the small, tributary water courses which are free from the danger of this fish. Our field experience leads us to believe that the upper reaches of these remote and inaccessible tributaries are natural refuges that will guarantee long survival of the Brazilian Merganser.

#### GENERAL HABITS

Until recently the only information about the habits of the Brazilian Merganser was given by Bertoni (1901: 10); I have prepared the following English version of his account:

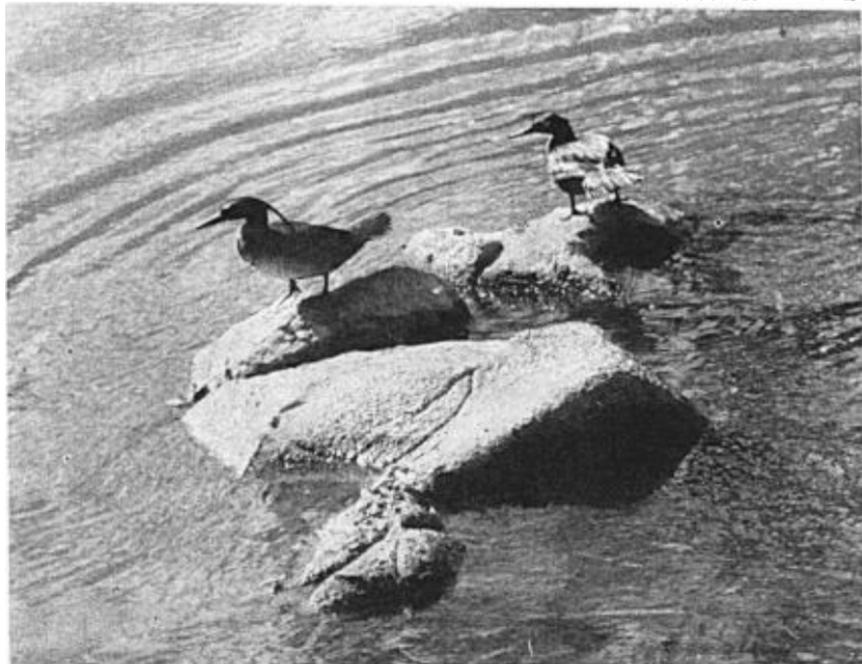
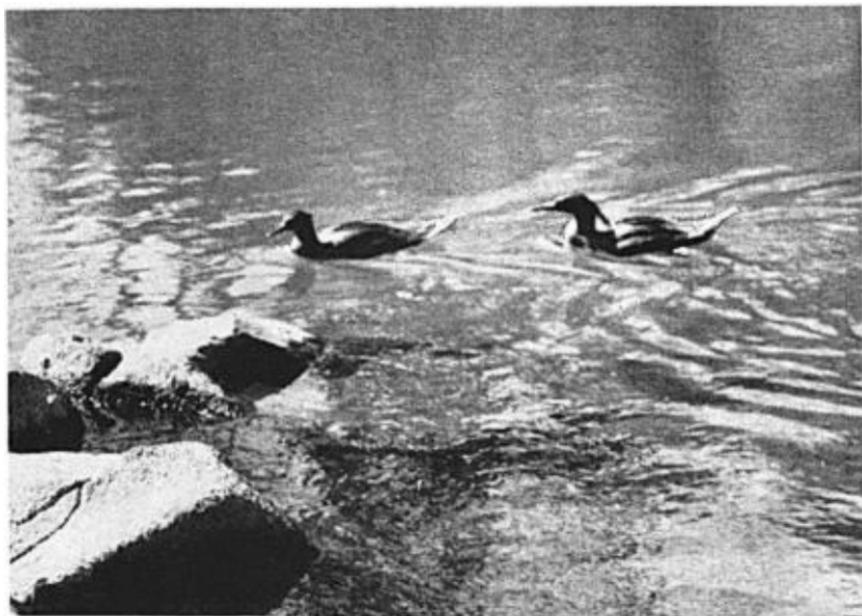
*"Habits.* They inhabit the silent streams that run through the undisturbed virgin forest, away from human populations, preferring the mouths [of streams and rivers]; from time to time they may come to the [Paraná] river shores. They go about in pairs or small groups. I have seen them during the winter. They fly swiftly but do not perform long flights. From their habits they appear to be sedentary birds. On the ground they run quickly, and it is a difficult task to follow them through the tangled trees and thickets; this explains why their legs are not placed as far back as in other ducks. When in the water, where they spend most of their time, they move swiftly. They



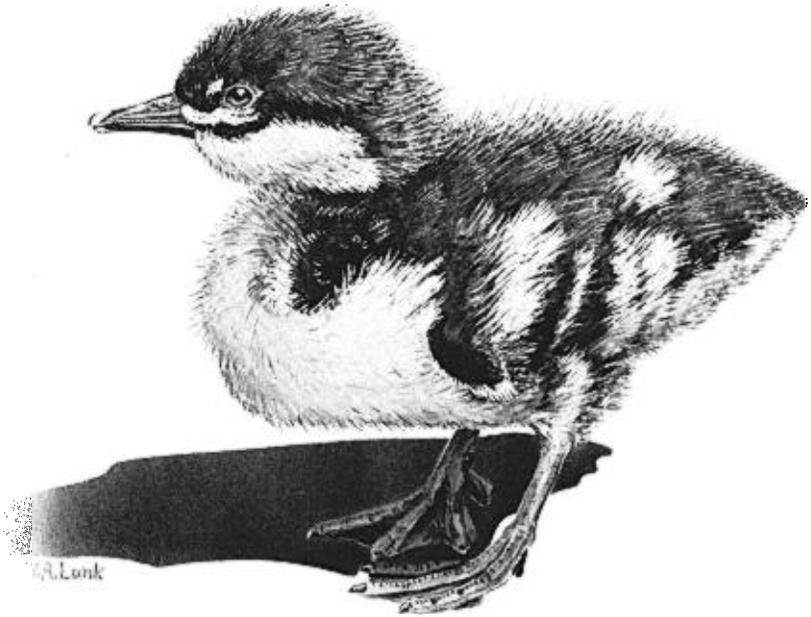
HABITAT OF THE BRAZILIAN MERGANSER NEAR KILOMETER 30 ON THE URUGUA-I RIVER, MISIONES, ARGENTINA. (*Above*) Still water near nesting site. (*Below*) Rapids, a regular feeding ground. Photographs by the author.



NEST SITE OF BRAZILIAN MERGANSER IN TREE ALONG THE URUGUA-I RIVER, DISCOVERED ON AUGUST 24, 1954. Arrow marks entrance to nest cavity. Photograph by the author.



PAIR OF BRAZILIAN MERGANSERS AT RESTING PLACE IN FRONT OF THE NEST TREE, AFTER FEEDING IN THE RAPIDS. Note shortened crest of the female. Photographs by the author.



THE DOWNY YOUNG OF THE BRAZILIAN MERGANSER (*Mergus octosetaceus*). This species lacks the rufous on the sides of the head characteristic of downy young of the North American mergansers. Wash drawing by William A. Lunk.

are good swimmers and can dive with great ability in pursuit of fish for a few seconds under water. They are voracious and I believe feed only on fish. If caught alive they fight hard to escape; they do not become tame but remain shy and wild. One that I had alive refused to take food and died in ten days time. Nevertheless it was fairly intelligent. Its flesh did not smell bad. The species is very rare."

After the recent rediscovery of this duck in Misiones, some further remarks on general habits were contributed by Gai (1950: 159) based on observations made during his first trip in 1948.

*Wariness.*—One of the outstanding characteristics of this rare duck is its extreme shyness. Brazilian Mergansers are always cautious and alert. A few of my observations are exceptions to the general rule. I stayed the whole month of August, 1951, in a small wooden house by the Arroyo Urugua-i "kilometer 10" near the bridge where the road to Iguazú crosses the river. The river can be seen from the house in front of which there is a large "corredera" (rapids), which makes the mighty Urugua-i roar day and night. Very soon after my arrival I learned that these rapids were the feeding grounds for two pairs of Brazilian Mergansers. Hidden on the shore, I spent many hours watching the movements of these ducks through my field glasses. This was the only time I saw more than two birds in one place; on some days there were only two or three, but usually members of a pair stayed together. These pairs often engaged in mating displays, which may be the reason they sometimes seemed fearless and did not seem to notice my presence even when I purposely showed myself.

Brazilian Mergansers can very seldom be approached on the water unless one comes on them suddenly around the bend of a river. One evening in February, 1951, while paddling along a straight section of the Urugua-i River, we caught sight of a pair of mergansers near a rapids; one of the birds was standing on a stone and the other was in the water. We were about 300 meters from them and could observe them with the help of our binoculars; they became alert as soon as they discovered us. Judging by their movements they were nervous, and they soon flew down the river away from us. On many other occasions we were unable to approach them along the river to within gunshot.

*Daily movements.*—Brazilian Mergansers are active day-feeders; they feed mostly along the rapids where fish are abundant and easy to obtain. During the day they may be seen either perching on rocks or diving for food. They are most active in the morning and evening. We have never found them active during the night in our travels

along the rivers. They sleep perched on stones and low branches at the shore, or on fallen trees projecting from the surface of the water. Although we have often hunted at night along the rivers of Misiones, we have seldom found Brazilian Mergansers at their roosting places.

*Gait, swimming, and diving.*—I have seldom seen the Brazilian Merganser walking much when ashore. When swimming or at rest in the water its body is only slightly submerged; this is a field-mark distinguishing the merganser from the Brazilian Cormorant (*Phalacrocorax brasilianus*) which is also found along these rivers and streams. The Brazilian Merganser sinks lower in the water before diving or when alarmed.

The Brazilian Merganser is an accomplished diver. The following account refers to the diving activities of two pairs of mergansers observed in August, 1951, on the Urugua-i River. The ducks were often observed feeding in the shallow waters at the upper end of a rapids where the swift current breaks against some emergent stones. Sometimes while one of the mergansers was feeding, the others perched on the rocks; at other times they were all in the water diving for food. Because some mating behavior occurred it was often difficult to tell whether the birds were feeding or playing. When diving, they leapt up before the plunge and disappeared below the surface for several seconds, emerging afterwards in nearly the same place.

Observations of the diving activities of the Brazilian Merganser were also made from the blind at the site of the nest discovered at "kilometer 30" of the Urugua-i River in 1954. On August 28, while the female was on the nest, the male guarding the river in front of the nest-site began to feed in the shallow waters near some emergent stones that he used for perches. The floating position of the body, with the tail up as when resting, was suddenly changed before diving: the body was somewhat lowered in the water, the tail fanned-out and dragging on the surface; then the bird would submerge quietly. During dives the bird remained under water for periods of 15 to 20 seconds, swimming swiftly with neck straightened and wings close to the body. I observed no wing movements while the bird was under water.

*Flight.*—The Brazilian Merganser flies close to the surface of the water and always follows the river's course. If during flight it encounters a potentially dangerous obstacle (such as a canoe) the merganser will increase altitude to as much as 15 or 20 meters, or deviate to one side. The flight is swift, wavering, and noiseless; the wings are moved continuously and rapidly. While on the wing the birds hold their necks stiffly outstretched, and the whole body has an elongated, slender shape.

*Voice*.—The Brazilian Merganser is an exceedingly silent bird, although occasionally a simple *queeek* may be heard while in flight. In the breeding season it becomes quite noisy when defending its nest or young.

*Food*.—From the examination of 11 stomachs and gullets it is clear that the Brazilian Merganser feeds primarily on live fish captured underwater. Occasionally it may take aquatic insects and snails.

Nine stomachs and gullets contained the remains of digested fish (usually scales and small bones) or entire specimens. Eighty per cent of the contents of one full stomach and gullet consisted of entire or partially digested remains of the larvae of a large dobson fly (*Corydalis*) and also a few (0.8 per cent) snail shells. No trace of vegetable food was found in the digestive tract of any specimen; a certain amount of grit and gravel was often present.

Brazilian Mergansers are quite voracious. Whole fish found in the gullet varied from 6 to 19 cm. long. In all cases where entire or half-digested fishes were found, they had been swallowed head-first. Digestion begins at the head of the fish as it enters the stomach. The fish is digested by stages; sometimes the undigested tail-half of one is found in the gullet together with an entire, recently-swallowed fish.

*The contents of eleven stomachs and gullets of Brazilian Merganser.* (The numbers of the bird skins are added to avoid repeating collecting data in the list of specimens given before.)

No. 31328. May 29, 1948. Killed at 9 A.M. Gullet and stomach empty. Only a small amount of grit and gravel found in stomach.

No. 31329. July 20, 1948. Killed at 5:15 P.M. Stomach contents: 25 cc., with 88 per cent insects (larvae of a dobson fly, *Corydalis* sp.) 2.5 per cent of fish remains, and 0.2 per cent of snail shells. Gullet contents: 20 cc., composed of 70 per cent of entire specimens of *Corydalis* and 30 per cent of fish remains.

No. 31330. July 22, 1948. Killed at 6 A.M. Stomach with 2 cc. of fish remains.

No. 31331. July 22, 1948. Killed at 12 Noon. Stomach with 14 cc. of digested fish remains.

No. 31332. July 22, 1948. Killed at 12 Noon. Stomach with 9 cc. of fish remains.

No. 31333. July 28, 1948. Killed at 2 P.M. Stomach with 12 cc. of fish remains.

No. 31760. September 12, 1949. Killed at 10 A.M. Gullet content: One entire small "Mojarra" (*Characinidae*), 6 cm. long.

No. 32367. March 24, 1950. Killed at 3 P.M. Stomach: 20 cc. of digested fish. Gullet: one entire half of a Cichlid fish, whose head had already been digested in the stomach.

No. 32368. March 24, 1950. Killed at 3 P.M. Stomach: 10 cc. of fish remains. Gullet: One complete "Cat-fish" (*Pimelodidae*), 19 cm. long.

No. 33245. August 16, 1951. Killed at 4 P.M. Stomach: 9 cc. of fish remains.

No. 33246. August 16, 1951. Killed at 4 P.M. Stomach: 12 cc. of fish remains including an entire half of a small Characinid. Gullet: an entire "Virolito," *Parodon*, (*affinis?*); [Family *Hemiodontidae*], 11 cm. long.

*Display*.—Giai (1950: 159) says the mating displays of the Brazilian Merganser begin in June; I have seen what I suppose were mating displays in August. Two pairs of Brazilian Mergansers which I found in the Urugua-i River in August, 1951, were undoubtedly at the beginning of a breeding period. Several of their movements appeared to be courtship attitudes. One bird (probably a female) was sometimes suddenly chased by another; without leaving the water they would move around in circles, paddling strongly with their wings. This display would last anywhere from a few seconds to several minutes. When one pair began its circular "display" the other pair would sometimes follow suit in a noisy entanglement of wings and splashed water. A few minutes later they would perch on stones, shaking the water from their bodies and preening.

#### BREEDING HABITS

The breeding habits of the Brazilian Merganser remained a mystery until the first nest was discovered in 1954 along the Arroyo Urugua-i, Misiones. On August 28, 1951, I found flightless young at "kilometer 10" of the Urugua-i River. In 1953, I was informed by native hunters that a pair of mergansers with a brood of five newly-hatched young was found in that same locality on August 2. Giai (1950: 159) mentions downy young found on August 4, 1948. All this information suggests that incubation occurs in July and that the young are hatched during the first days of August.

In July, 1954, while searching for the Brazilian Merganser along the Urugua-i River, I failed to find nests because of an exceptionally rainy season which made thorough exploration along the river impossible. After our camp was established at "kilometer 30" I was informed by native hunters that downy young were found at "kilometer 10" in the first week of August. While exploring the Urugua-i River near our camp in August, a pair of mergansers with no young was located. After watching their movements for several days, I discovered their nest on August 24, when the female flew to it from the water. This pair of mergansers was apparently one month late in breeding according to all the previous information.

*Nest*.—The nest was located in the hollow limb of a live tree known locally as "Yvyrà pýtâ" (*Peltophorum dubium*; Family Leguminosae) at a height of about 25 meters above water level (Plate 18). The tree was growing on the shore, and the branch with the nest-hole, which faced the water, was visible from the river. The entrance hole was 35 by 15 centimeters and the nest-cavity was 3 meters deep. A great deal of fine, rotten wood was removed from the bottom of the

cavity after the young had left. No other material was found in the cavity except for some pieces of egg shell, which were of a light cream color.

*Behavior of parents at nest.*—I followed the movements of the mergansers for seven days from a blind built on the river shore under the tree in which the nest was located. Incubation was performed only by the female. While she was at the nest the male was always in the river; he spent most of his time perching on a group of stones emerging from the water in front of the nest site. While resting, he would lie on the stones with his head under one wing, apparently sleeping. At the slightest noise he would rise up and look around; on finding that everything was quiet, he would resume resting. At other times he would feed in the shallow water near the emergent stones.

The female came out of the nest to feed only once a day. Every morning between 8:30 and 9:00 A.M. she flew out of the nest to the river, giving a few loud calls. The male answered the calls while flying towards her; both then flew together to their feeding grounds along the rapids. They sometimes flew upstream and at other times downstream as the nest was located half way between two rapids. They never fed together in front of the nest. They stayed from an hour to an hour and a half on the feeding grounds. On returning to the nesting area they uttered loud cries before alighting on the water. Next they swam towards the stones (Plate 19), and after climbing on them, stayed there for about 10 or 20 minutes, drying their plumage. Leaving the stones, they swam towards the middle of the river and from there flew to the nest. The male always flew with the female to about three or four meters from the entrance of the nest; as the female went in, he flew back to the river. Once on the water, he uttered a long cry, sometimes two, looking towards the nest. The male passed the rest of the day near the nest.

On August 27, after both birds had returned from the feeding grounds and before the female had flown to the nest, they copulated. Having dried their feathers while perched on the stones, they returned to the water and began to bathe. Suddenly the female partially submerged herself—her head, neck, body, and tail forming a straight line at water level. She remained motionless in that position for a few seconds until the male mounted her holding her short crest with his bill. When they copulated both birds were completely submerged. On completion of the mating act the female uttered a long cry. Both birds bathed, perched on the stones drying their plumage, and then the female flew to the nest.

The holding of the female's crest by the male during copulation

causes considerable wear; many of its feathers may be broken off near their bases so that some of the females appear crestless. At other times of the year the crest of the female is only slightly shorter than that of the male.

On August 28 and 29, I did not see the female leave the nest, although I was at the blind well before the usual feeding time. The male was alone on the river. On August 30 the female came out to feed, but the pair spent only half an hour on the feeding grounds. When they came back they seemed frightened; before the female went in they flew past in front of the nest twice giving loud cries. When the female went to the nest, the male uttered three long cries. That same afternoon the young left the nest. Unfortunately, not having been at the blind when this occurred, I failed to see how the young mergansers reached the water from the nest. The next day, August 31, four downy young were found on the river with their parents.

*Young.*—The four young mergansers showed great agility on the water when pursued. They ran very swiftly, hardly touching the surface of the water with their feet and continuously flapping their wings; they never dove.

The upper parts of the downy young Brazilian Merganser are black with three white patches: on the wing, side of back, and side of rump. The under parts are pure white. A white stripe extends from the lore to below the eye. There is a white spot in front of the eye. The iris is gray; the bill black; legs and feet drab gray; webs black (Plate 20).

#### ENEMIES

While watching the adult Brazilian Mergansers from a blind near the nest, I have seen them frightened by any large bird flying across the river or by the slightest sound of the flapping of wings nearby. They seem always to be expecting some enemy from the air. On one occasion both birds were perched on the stones in front of my blind, drying their plumage, when the sudden flapping of wings by a Common Urraca Jay (*Cyanocorax chrysops*) frightened them so greatly that they each uttered a loud cry and dove into the water.

Apparently the most dangerous enemy of the Brazilian Merganser in Misiones is the Black-and-White Crested Eagle (*Spizastur melanoleucus*). On September 1, 1954, we found our pair of Brazilian Mergansers with the young hidden on the quiet waters under the thicket growing on the river shore. Above them, watching from a dead tree, was a Black-and-White Crested Eagle, undoubtedly waiting for the mergansers to come out into the open water. Black-and-White

Crested Eagles were found by us many times along the Urugua-i River.

Giai (1951: 256) reports the Black-and-White Crested Eagle preying upon the mergansers.

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#### SUMMARY

The Brazilian Merganser was rediscovered in Misiones (Argentina) in 1947; up to that time the species had been considered close to extinction.

The available locality records indicate that the Brazilian Merganser is restricted to southeastern Brazil and the neighboring regions of Paraguay and Argentina.

In Misiones the Brazilian Merganser is not rare but has been found only along the small rivers and streams that flow from the highlands in the interior of the province into the Alto Paraná, which is a tributary of the La Plata River. The Brazilian Merganser lives in the wildest parts of these small rivers and has never been found on the Alto Paraná itself.

Brazilian Mergansers are sedentary birds and probably spend their entire lives along a small part of one river. The species is non-migratory and the pairs appear to stay together throughout the year.

The feeding grounds of the Brazilian Merganser are along the rapids. They dive for their food which consists mainly of fish up to 19 centimeters in length.

The breeding season begins in June. Incubation occurs in July and August. Downy young have been found in August. The first and only nest discovered was in the hollow limb of a tree and was 25 meters above the water level. Four black and white downy young left the nest on August 30, 1954.

Probably the most dangerous enemy of the Brazilian Merganser in Misiones is the Black-and-White Crested Eagle (*Spizastur melano-leucus*).

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