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Thomas BARBOUR and the *UTOWANA* Voyages (1929–1934) in the West Indies

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Abstract. Between 1929 and 1934, Thomas BARBOUR made four voyages on the research yacht *Utowana*, owned by Allison V. ARMOUR. Three of the four voyages were centered in the West Indies, with the Bahamas, Hispaniola, and the Lesser Antilles as primary geographic foci. Because of the ephemeral amount of time spent on any one island, many of the amphibian and reptilian specimens were accumulated by establishing "markets," whereby the locals at a particular port were encouraged to collect and were subsequently paid for the specimens they brought to BARBOUR. Although this technique resulted in a rapid accumulation of specimens, it often precluded firsthand encounters with the herpetofauna. This subsequently led BARBOUR to make many misleading statements regarding the rarity of certain frogs and reptiles. Despite accumulating many valuable collections, the *Utowana* expeditions resulted in the discovery of only six currently recognized full species of West Indian frogs and squamate reptiles. This is a surprisingly low figure considering the number of species described subsequent to the *Utowana* voyages, but it undoubtedly reflects the method used for accumulating specimens.

Key words. Allison ARMOUR, amphibians, reptiles, history of herpetology.

I am quite overwhelmed with emotion and I have to master an overwhelming feeling of nostalgia which is engendered when I attempt to write about our voyages on the Utowana.

Thomas BARBOUR, 1945

I. INTRODUCTION

Nowhere in the Western Hemisphere has herpetological exploration had a longer history than in the West Indies. It began, albeit with a focus on other goals, with COLUMBUS'S first landfall in 1492, ostensibly on San Salvador (Watling's) Island in the Bahamas, where he undoubtedly observed reptiles that are no longer extant on that island (e.g., *Cyclura rileyi* Stejneger, 1903; OLSON et al. 1990). COLUMBUS's writings (*in* MAJOR 1870; MORISON 1963) contained frequent references to turtles and iguanas (presumably marine turtles and *Cyclura* spp.), as do those of Gonzalo DE OVIEDO (*in* STOUDEMIRE 1959), who lived in the Caribbean during 1512–1557. Those early acknowledgments of the rich herpetological bounty of the West Indies set the stage for the subsequent systematic collecting that has been ongoing for about 300 years (WILLIAMS 1999), and which continues to the present day. New species are being discovered and described every year, especially on the Greater Antillean islands of Cuba and Hispaniola (HEDGES 1996; POWELL & HENDERSON 1999, 2003a).

Today, biologists intent on herpetological exploration can fly to virtually all of the major islands in the West Indies, and many of the lesser ones as well. Many Antillean landfalls, however, still can be reached only by boat. Fifty and more years ago, however, herpetological exploration in the West Indies was dependent solely on boat transportation to reach all but a few large islands. Herein we appraise voyages made in 1929–1934 on, arguably, the most famous research vessel used in herpetological explorations of the West Indies, the means used to assemble the collections, and the man who assembled them.

EYERDAM (1954) provided the following account of field work in the West Indies in 1927: "He seldom carried more than . . . a machete, pocket knife, aneroid [barometer], and pack-sack; with blanket, a small pot to boil tea, and enough sugar and biscuits to last two or three days. For water, he depended mostly on what he could find in the forest or get from natives. He always spent the nights in native huts when in the mountains, and enjoyed the cheerful hospitality of the people. Sometimes he made the grievous mistake of not carrying enough water, when climbing a high mountain or traversing an arid district; and several times he suffered great hardship from this lack of precaution". Although an accurate description of the travails that faced biologists working in the region during the early part of this century, EYERDAM was not describing the efforts of a herpetologist, but instead those of Eric EKMAN, the noted Swedish botanist. EKMAN was "fearless and daring," "used to hard marches," and came to know intimately "nearly every valley and . . . most of the mountains and islands of Haiti and Cuba. He knew the conditions and surroundings in detail". EKMAN died in 1931 of malaria, contracted during his expeditions.

In stark contrast to EKMAN's Spartan approach to field work, picture, if you can, the opportunity provided by access to a 70-meter-long (230-foot) yacht with a crew of 30 and a sailing radius of 12,000 miles (22,000 km). Picture further this vessel on the amazingly blue waters of the Caribbean, going from the palm-lined shores of one sun-drenched island to those of another in search of amphibians and reptiles. Living conditions aboard the yacht are very comfortable, food is of gourmet quality, yet laboratory space for specimen preparation is available and an automobile is carried below deck for excursions on land. This was life on the *Utowana*, the ship on which Thomas BARBOUR (1884–1946) (Fig. 1), certainly the most influential herpetologist working in the West Indies during the first half of the 20th century, visited many islands between 1929 and 1934.

Fig. 1: Thomas BARBOUR (photograph courtesy of Kraig ADLER).

2. THOMAS BARBOUR AND WEST INDIAN HERPETOLOGY

Beginning with Samuel GARMAN (1843–1927), herpetology at Harvard College's Museum of Comparative Zoology (MCZ) has had a long history of field work in the West Indies. GARMAN accompanied Alexander AGASSIZ to the West Indies on *The Blake* in 1879. Subsequently, during 1887 and 1888, he published a series of significant contributions to the herpetological literature of the area, describing 18 species of lizards (16) and snakes (2) that are recognized today (POWELL & HENDERSON 1996a). GARMAN, known primarily for his work in ichthyology (JORDAN & BARBOUR 1928), based his West Indian herpetological publications not only on material he collected himself while on *The Blake*, but also on specimens purchased from other collectors (GARMAN 1887). Thomas BARBOUR worked with GARMAN for many years, and considered him an extraordinary character, but did not realize ". . . what an oddity he really was until after his death when I found in a cupboard in his room a jar full of little stickers bearing his name and address which he had cut from each copy of the *Nation* . . . more unsavory was another jar, at least three feet high, which contained bits of bread, the uneaten corners of the sandwiches which [he] had brought for his lunches for years and years" (BARBOUR 1943).

The herpetological baton at Harvard passed from GARMAN to BARBOUR around 1910, and the latter figured prominently in the history of West Indian herpetology between 1910 and 1942 (POWELL & HENDERSON 1996; WILLIAMS 1999). He described 40 species of Antillean frogs (9), turtles (1), and squamates (30) recognized today.

Although BARBOUR's research was not limited to a West Indian focus (he published in excess of 350 papers on various aspects of biology; BIGELOW 1952), his Antillean publications are those most frequently cited today. His life has been given cursory examination in several obituaries (BIGELOW 1952; DUNN 1946; LOVERIDGE 1946) and historical overviews of West Indian herpetology (HENDERSON & POWELL 2003; POWELL & HENDERSON 1996a, 2003b; WILLIAMS 1999). Despite his significant contributions to herpetology, BARBOUR has sustained criticism, especially in the methods he employed in securing specimens during field work. He was born into wealth, maintained a comfortable lifestyle throughout his career, and perhaps it is only fitting that someone with BARBOUR's social status should have the opportunity to conduct some of his field work from the comfort of a yacht.

3. ALLISON ARMOUR AND THE RESEARCH YACHT *UTOWANA*

Born in Chicago on 18 March 1863, Allison ARMOUR (Fig. 2) received a B. A. degree from Yale in 1884. He was married in 1885, but his wife died in France in 1890. According to David FAIRCHILD (BARBOUR 1945), "Allison was the soul of courtesy towards ladies but I have always felt that the tragedy of his early marriage

Fig. 2: Allison ARMOUR (left) and Thomas BARBOUR on the deck of the *Utowana* (photograph used with the permission of Louisa B. PARKER).

Fig. 3: The *Utowana* anchored off Castries, St. Lucia (Ernst MAYR Library of the Museum of Comparative Zoology, Harvard University. © President and Fellows of Harvard College).

prevented him from ever marrying again". Once, as FAIRCHILD and ARMOUR drove through Nice, ARMOUR pointed to a fashionable hotel on a cliff and remarked, "There is where the light of my life went out".

BARBOUR (1945) described ARMOUR as "formal, almost stiff, . . . and he moved and met people with a stately, rather old-fashioned dignity . . . He was never a man who told a smutty story or indulged in any evidence of vulgarity. He was nevertheless one of the wittiest men that I ever knew, a born *raconteur*, with a background of travel all over the world and a marvelously retentive memory . . . With all his apparent stiffness and formality, Allison had so warm a heart and such a deeply generous nature that he made friends everywhere. His apparent stiffness was really a defense reaction for Allison was essentially a shy man". BARBOUR's daughter Louisa, a member of the 1934 *Utowana* voyage, described ARMOUR as "terribly generous, anything you'd want, he'd get" (pers. comm. to RWH; 10 Aug 1999). Thomas BARBOUR considered him "a distinguished epicure, seriously interested in serving good food and good wine . . .", and Louisa BARBOUR (pers. comm. to RWH; 10 Aug 1999) observed that her father and ARMOUR "would eat anything". Despite an apparently fastidious nature, BARBOUR concluded that ARMOUR, "took a sincere interest in the somewhat messy pastimes which were an inevitable concomitant of the immediate presence of naturalists, and he was as keen to provide adequate facilities for the botanists as well as for the zoologists . . .". ARMOUR was an honorary member of the New York Academy of Sciences and in 1931 was awarded the Frank M. MEYER Medal by the American Genetic Association. He died on 7 March 1941.

During his lifetime, ARMOUR spent considerable time cruising on a series of boats, especially in European waters. Prior to World War I, he used a schooner-rigged vessel for archaeological research in North Africa. The yacht (Fig. 3) that carried BARBOUR on the West Indian expeditions was originally a tramp steamer that ARMOUR had converted into a luxurious floating laboratory at Göteborg, Sweden. She was 70.1 m (230 feet) long by 10.3 m (33 feet 10 inches) at the beam, and her weight was 1,192,948 kg (1315 tons). She drew 3.35–3.66 m (11–12 feet) draft and was provided with two Atlas Diesel 500 H.P. engines capable of speeds of up to 10.5 knots/hour (FAIRCHILD 1930; BARBOUR 1943). According to BARBOUR (1945), the main deck was big and comfortable, with a "roomy lounge forward and an airy, cool, dining salon aft. Below there were nine very spacious cabins with baths, and aft . . . was the laboratory, thoroughly equipped for all sorts of scientific work. She was the last word in luxury in the sense that she was roomy and well furnished but there was nothing elaborate or gaudy about her equipment. She was built for work and not play. She carried a motorcar below the decks which could be hoisted out through the old cargo hatch . . . and let down upon a dock with only a few moments delay. As a means of collecting she was just about perfect although, of course, there were many localities where her depth kept her from getting near shore". FAIRCHILD (1930) recalled ARMOUR saying that, "he could victual her for a six months' cruise, that she had tanks carrying 200 tons of water and enough oil for a cruising radius of 12,000 sea miles, and that there was a crew on her of 30 men". FAIRCHILD considered her " . . . nothing short of a floating palace". This *Utowana* made its maiden voyage in 1925 when it was used in U. S. Department of Agriculture–sponsored research under the direction of David FAIRCHILD (a friend of ARMOUR'S), cruising as far east as Ceylon (now Sri Lanka). Subsequent cruises took the *Utowana* and Armour to the Canary Islands and West Africa, again under the charge of FAIRCHILD and the U. S. Department of Agriculture for the purpose of botanical exploration. Some 1,400 varieties of plants were collected and brought back to the United States for study (ANONYMOUS 1941). Several expeditions via the *Utowana* were made specifically to search for plants that had the poten-

tial for use in the southeastern United States, and the *Utowana* made at least eight voyages in the service of the U. S. Department of Agriculture. As of 16 April 1933, the *Utowana* had traveled 201,341 km (108,657 miles) and had made a total of 369 stops at 199 ports in 56 countries (ANONYMOUS 1933).

BARBOUR's first experience on the *Utowana* apparently occurred in 1928, and it was brief. Nevertheless, he (BARBOUR 1945) "instantly saw the possibilities of the yacht for zoological, as well as botanical collecting". BARBOUR's first research voyage on the *Utowana* occurred in 1929 and, according to BARBOUR & SHREVE (1935), the boat went out of commission sometime after the 1934 West Indian cruise.

4. THE VOYAGES

Between 1929 and 1934, Barbour participated in four voyages on the *Utowana* in order that he and other biologists could collect, but only three had a primarily West Indian focus. Because so many people participated in each of the voyages, it seems unlikely that any was arranged specifically for BARBOUR.

4.1. Voyage of 1929 (Fig. 4).

Although BARBOUR (1945) reported that his first voyage on the *Utowana* commenced at Nassau on 15 January, records at the Ernst MAYR Library at the MCZ state that the *Utowana* was in New London, Connecticut on 15 January 1929, did not stop at Nassau, and went directly from Miami to Havana. Regardless of the starting date and port, according to BARBOUR, "This enterprise was not to be strictly either botanical or zoological. Our mutual friend, Charles Francis ADAMS, then Secretary of the Navy, was anxious to obtain certain confidential information concerning some of the Lesser Antilles". Therefore, aside from ARMOUR, the crew, Armour's nephew, and some additional friends, BARBOUR's shipmates included Navy Lt. E. E. DUVAL.

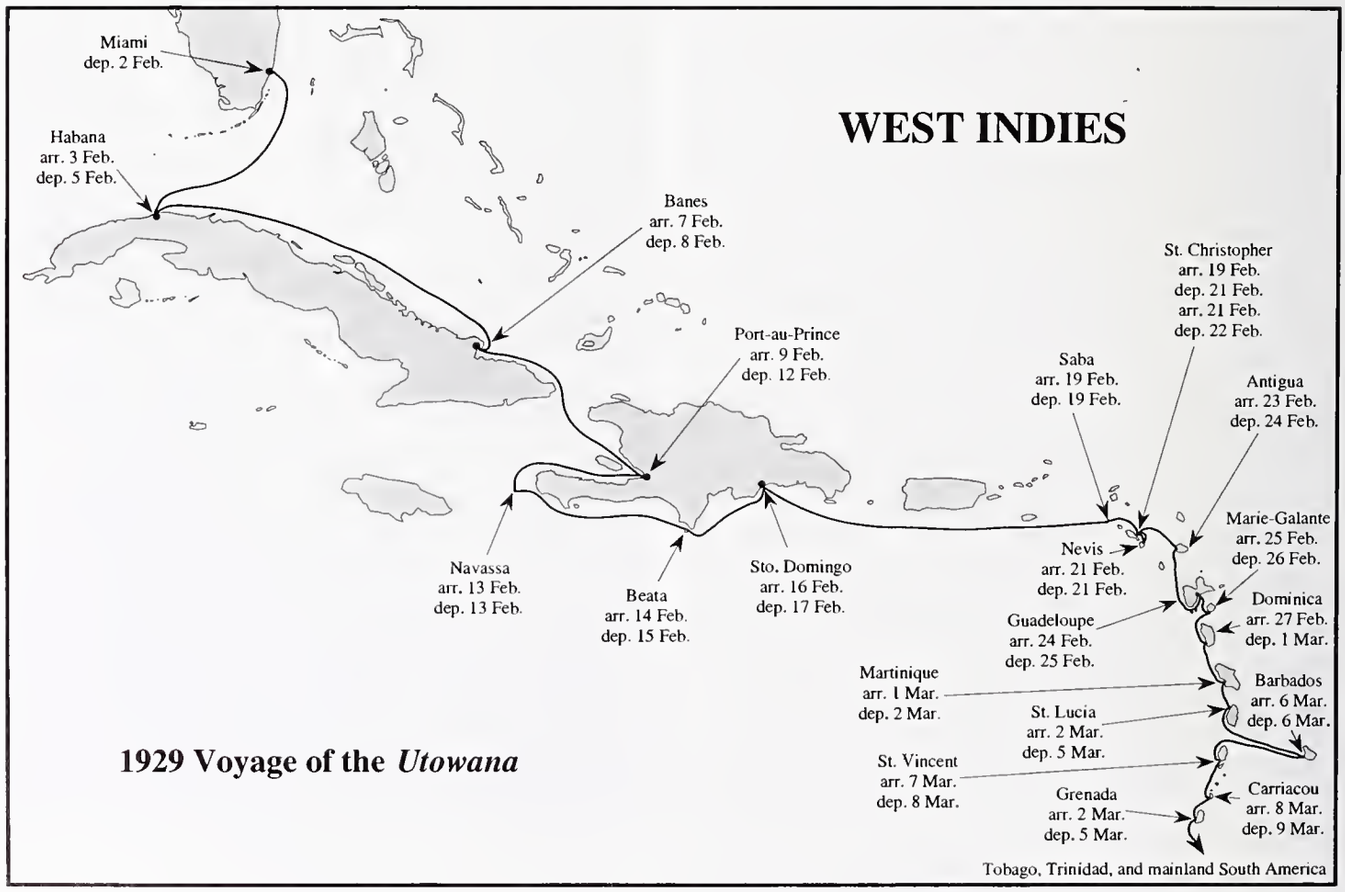

Fig. 4: Map of the route and itinerary of the 1929 *Utowana* West Indian voyage.

Five days were spent in Cuba before the *Utowana* proceeded to Hispaniola. Again a discrepancy exists between BARBOUR's (1945) account and that of the ARMOUR archives at the MCZ. According to BARBOUR, a landing at Navassa was attempted (and thwarted by heavy seas) before going to Hispaniola, but the MCZ material states that the *Utowana* arrived in Port-au-Prince on 9 February, and Navassa on 13 February. In Port-au-Prince, BARBOUR, already enamored with the West Indies, was taken with the women going to mar-

ket, ". . . the impression that will stand out as long as I live will be the long lines of women, bearing incredible burdens on their heads, pad-padding along the dusty roads on their way to market. They came from unbelievable distances and look forward to much visiting and chaffering after reaching their destination".

Two subsequent days, 14 and 15 February, were spent at Isla Beata, situated off the southwestern tip of the Barahona Peninsula in the Dominican Republic. Here BARBOUR collected *Cyclura cornuta* (Bonnaterre, 1789) and ". . . preserved several. I am glad we did, for observations made during the visit, and subsequent ones as well, forced the conclusion that they belong to a doomed race [see below: page 306]. No young individuals were to be found and tracks in the sand showed that feral cats, escaped from the camps of fishermen, who go to Beata to dry fish or catch turtles, were responsible" (BARBOUR 1945).

Following their sojourn on Hispaniola, the *Utowana* visited many ports in the Lesser Antilles (19 February–10 March). Despite not having previously collected on those islands, BARBOUR apparently did little collecting. His rationale was that the ". . . collections from the West Indies in the Museum of Comparative Zoology are extraordinarily rich and varied, so that in many localities there was nothing especially for me to do but see the sights. This always gave me the greatest possible enjoyment. Next to vigorous collecting in a new locality, nothing is so interesting to the naturalist as the opportunity to see those places from which he has studied material gathered by other collectors" (BARBOUR 1945). He was pleased, however, "to see the peculiar Anolis lizard [*Anolis sabanus* Garman, 1887] of Saba in life [February 19] . . . I had sturdily held out for its distinctness on the basis of coloration, which I will confess fades considerably after preservation. The critter in life, however, fully justifies the assertion which I had made" (and which subsequent workers in the West Indies have supported).

On Marie Galante (25–26 February), an island in the Guadeloupean Archipelago, BARBOUR found *Anolis fereus* (Cope, 1864) "surprisingly abundant... The types were in the Agassiz Museum and had been collected by Samuel GARMAN while he was in the West Indies on the Blake in 1879, with Alexander AGASSIZ. Our series of the specimens originally taken was somewhat depleted. A number of museums had sought examples of this most peculiar creature, which is naturally hard to get because Marie Galante is seldom visited. I took the opportunity to lay in a fresh supply" (BARBOUR 1945). BARBOUR found it "strange that so many of these little islands which at first sight appeared to be but recently separated from their larger neighbors should support so many extraordinarily distinct lizards. "The Anolis of Marie Galante is a truly beautiful lizard, and if there were not other species which more or less intergrade with the general run of the species in this enormous genus, it might be set forth itself as being generically distinct" (BARBOUR 1943).

After departing the West Indies, the *Utowana* and BARBOUR headed for South and Central America. At Roatán in the Islas de la Bahía (Honduras), BARBOUR collected a series of an undescribed anole that he subsequently named *Anolis allisoni* Barbour, 1928 (now known also from Cuba), in honor of his host aboard the *Utowana*.

4.2. Voyage of 1931.

This voyage was largely devoted to working on the Central American mainland, but brief sojourns in the Bahamas, Cuba, and the Swan Islands provided some West Indian flavor. BARBOUR's (1945) account of this voyage made no mention of herpetological collecting.

4.3. Voyage of 1933.

BARBOUR's second voyage on the *Utowana* with a strong West Indian focus began from Nassau on 16 February. Besides BARBOUR, Armour, and crew, biologists David FAIRCHILD and James C. GREENWAY were aboard. This voyage visited six sites in the Bahamas (16–27 February), Haiti (28 February–4 March), Jamaica (5–11 March), Providencia (13–15 March), and San Andrés (15–16 March). After a stop in the Canal Zone (17–26 March), an ephemeral visit to Grand Cayman (29 March) preceded a sojourn on Cuba. According to BARBOUR (1945), "This was a wholly charming voyage. Most of the time the weather was ideal and as most of the localities we visited were remote and little known to naturalists, our booty was a rich one". BARBOUR departed the *Utowana* at Cienfuegos, Cuba on 3 April, and remarked upon the conspicuous ". . . daily thanksgiving by my shamelessly worldly self for the delicious cuisine for which the yacht was famed. I am ashamed to say I began to gain weight badly during this voyage . . .". BARBOUR's (1945) account of this voyage makes almost no mention of collecting herpetological material, but instead referred to Nye's Woodpecker on San Salvador, land shells on Fortune, Crooked, and Mariguana (= Mayaguana) islands, rodents on East Plana Cay, birds on San Andres, "bullhorn acacias swarming with stinging ants" on Providencia, and ". . . a day collecting land shells to good advantage" on Grand Cayman. Only on Mayaguana did he allude to collecting ". . . more new lizards . . .".

4.4. Voyage of 1934 (Fig. 5)

BARBOUR's last voyage on the *Utowana* commenced in Nassau from 1–7 February. James C. GREENWAY was again on board, as was his wife Helen. The first landfall of herpetological significance was Great Inagua on 25–27 February. GREENWAY swam from the yacht's launch

to Sheep Cay, just off Great Inagua, where he collected a new boa (*Epicrates relicquus* Barbour & Shreve, 1935, now *E. chrysogaster relicquus*) and a new racer (*Alsophis vudii utowanae* Barbour & Shreve, 1935), ". . . which no doubt once occurred on Inagua itself. Now that island is so completely overrun with feral dogs and cats that the extermination of the two new species he [GREENWAY] found still to exist on the Cay is not really surprising" (BARBOUR 1945). In 1943, he had written, "I suspect that these [*Epicrates* and *Alsophis*] once were abundant all over Inagua and that they have been extirpated by the introduced vermin. At any rate as far as I know no one ever found them on the large island and it has been visited by a number of naturalists" (BARBOUR 1943). Despite BARBOUR's gloomy view of Inagua, both the boa and the racer subsequently were collected there (SCHWARTZ & THOMAS 1975).

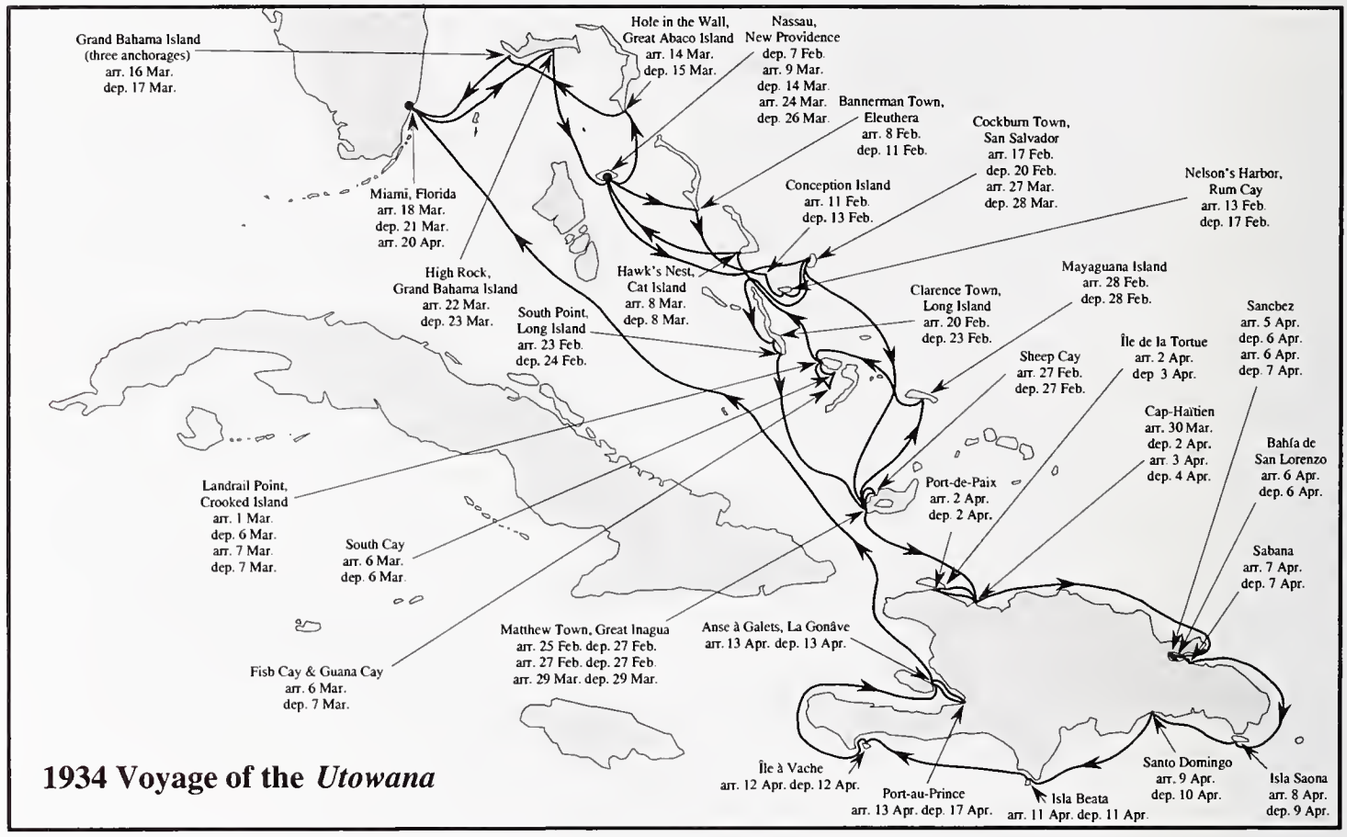

Fig. 5: Map of the route and itinerary of the 1934 *Utowana* West Indian voyage.

Apparently the locals on Mayaguana, Crooked Island, nearby South Cay, and Fish Cay (off Acklin's Island) "turned out to be keen collectors, and we got enormous amounts of material. Birds, iguanas, and other lizards, butterflies, and land snails, fell to our 'bow and spear' in quantities" (BARBOUR 1945). Returning to Nassau on 9 March, the GREENWAYS, who, in BARBOUR's (1945) words, were ". . . extremely efficient collectors", departed the *Utowana*. ARMOUR and BARBOUR were then joined by Froelich RAINEY, an archaeologist from Yale's Peabody Museum, BARBOUR's wife Rosamond, and his daughters Julia and Louisa. "My daughters are not interested in collecting in any form and neither they nor their mother are really comfortable in hot weather, but in spite of all this, I know that the ensuing voyage remains for them a pleasant memory" (BARBOUR 1945). With the exception of a stop in Miami on 18–21 March, the *Utowana* remained in the Bahamas until 30 March, revisiting several islands for the benefit of BARBOUR's family.

After leaving the Bahamas, the yacht sailed south toward Hispaniola, stopping initially at Cap Haïtien (30 March). Subsequently, at Île de la Tortue (2 April), ". . . the people were most industrious collectors and we got an unbelievable number of snakes, several of which were new" (BARBOUR 1945). From there the expedition proceeded to Samana Bay (5 April) on the eastern coast of the Dominican Republic. BARBOUR waxed poetic about this site (". . . an enchanting body of water, quite indescribable"), but made no mention of collecting. After Samana, the *Utowana* anchored at Isla Saona (8 April), off the southeastern coast of the Dominican Republic [although BARBOUR (1943) erroneously stated that it was "off the coast of Haiti"]. "It is a rather flat, uninteresting little island and I was not prepared for

what I found. I knew that there was a high degree of endemicity on all these islands around the [Hispaniolan] coast. I knew, also, that Saona had never been visited by anyone in search of reptiles, so I walked around the confines of a small garden patch, knowing that this was the sort of terrain where one might expect to find Ameiva lizards. Lizards of this genus have a way of splitting up, so novelties may be expected.

"I hunted a long time before I heard a noise in the dead leaves. Ameiva lizards are anteaters and scratch with their paws among the leaves, throwing them about in their search for the insects which may be below them. I approached the sound as stealthily as possible and could scarcely believe my eyes when I saw a perfectly typical Ameiva, and by the same token one utterly unlike any of which I had ever seen . . . It was lilac gray on the back, washed with fawn color on the head and turning to pale blue on the tail. A black band, beginning with the eyes, ran along the side of the body and the tail, which was azure blue beneath, while the undersurfaces of the body were glaucous blue, suffused anteriorly with cream color. The sides of the head were buff yellow. All in all, it was one of the most beautiful and strikingly colored reptiles which I have ever seen.

"I sent the specimen to Miss COCHRAN at the National Museum in Washington, . . . although I fairly itched to describe it myself. I realized it was new the second I saw it ... and asked her if she would name it for my wife" (BARBOUR 1943). COCHRAN described *Ameiva rosamondae* Cochran, 1934 (now *A. taeniura rosamondae*; Fig. 6) in 1934, and noted that "Dr. BARBOUR saw but two individuals of this beautiful species. They were excessively shy and he secured the unique type with great difficulty on account of its being almost impossible to use a collecting gun in the very dense, thorny scrub".

After a brief stop in Santo Domingo, the *Utowana* proceeded to Isla Beata on 11 April. There BARBOUR (1945) "wanted to make another search to see if any but adult iguanas [*Cyclura cornuta*] could be found. We hunted for young individuals once more in vain and found the population of adults grown smaller". On 12 April the *Utowana* arrived at Île-à-Vache off Haiti's southern coast. "Here the natives again outdid themselves and the number of reptiles secured during the couple of days we spent in a pretty anchorage between Isle Vache and the mainland was most satisfying" (Barbour 1945). The departure from Île-à-Vache and arrival at Anse à Galets, Île de la Gonâve occurred on the next day. BARBOUR apparently left two buckets of alcohol with a local parish priest and then departed Gonâve the same day (13 April). After a sojourn in Port-au-Prince until 17 April, he returned to Gonâve and, upon arrival, ". . . found our two covered buckets of alcohol full of lizards. We sat for awhile on the porch of the pitiful little rectory, conversing in our pretty poor French, and with difficulty reimbursed the priest for the money that he had dispensed among his flock for catching the lizards. We walked back down the hill, after a long and wonderful day which neither Rosamond nor I will ever forget. I then climbed the long gangway on board the Utowana for the last time. I left her in Miami on the 20th of April, 1934" (BARBOUR 1945).

Fig. 6: *Ameiva taeniura rosamondae* [Milwaukee Public Museum 18886] collected at Mano Juan, Isla Saona, Dominican Republic (photograph by Richard A. SAJDAK).

5. COLLECTING STRATEGY

The collecting strategy usually employed by BARBOUR during the *Utowana* expeditions has been criticized (e.g., CURTIS 1947), yet it was an extremely efficient means of accumulating long series of specimens of some species in short periods of time, and one that has been used to great advantage in the West Indies by many contemporary herpetologists. The technique was to establish "markets" at different ports. BARBOUR

(1946) described the protocol: "If the harbor where the *Utowana* came to anchor was uninhabited, there was nothing to do but scratch for ourselves . . . Many of these creatures [birds and lizards] were collected with a .22 rifle, the cartridges being loaded with dust shot. When, as was usually the case, we anchored off a village in the Bahamas or one of the islands about Haiti, we generally went ashore first to size up the population. You must remember that all people who met us for the first time were entirely convinced we were crazy. I always carried a sack of small coins, British or Haitian . . . These we would display freely and all and sundry would be informed that we would buy living creatures of the various groups of animals which we knew from long experience might reasonably be expected to be caught without doing the specimens too much damage. We would advise our helpers to roll stones over, and search under banana trash and driftwood, seeking out the little snakes and lizards that hide under such material.

"We carried cans, jars, and canvas sacks of various sizes to lend out as containers – and, I may add, the temptation to purloin these was often too great to withstand. Usually we picked out a youngster, either a boy or a bright young girl, who could head up the collectors. If they showed a willingness to scatter off into the brush and go to work right away [we would collect also] . . . If, however, . . . they simply persisted in standing about to stare, there was nothing to do but go back on the yacht . . . This, of course, was not what we most wanted to do, but the point was to get the largest amount of material in the shortest time possible.

... It is essential to buy everything which is brought to one by natives unless the quarry represents something which in the beginning you have said very definitely you did not want. If you do not do this, your [collectors] will think that you have not dealt fairly with them. They cannot tell perfect specimens from damaged specimens... When a laggard comes along with fifty additional specimens of some species you have found to be really common, the temptation is to say, 'No, I don't want any more.' To do this is a fatally bad practice.

It is well to pay two to three times the price originally offered for something which turns out to be really rare. Be careful, however, not to stress too much the searching for rarities when they are not reasonably easy to find. Discouragement often results . . ."

In Haiti, for example, BARBOUR (1943) explained, "We often had as many as a hundred people collecting for us. In this way, on the islands that were populated of course, it was possible to secure in a few days as much material as a single person could have gotten in a long stay, so that while we stopped at innumerable different localities during these voyages on the *Utowana* and never had very much time at one place, all around Haiti and the Bahamas we got big collections. You can do this in Jamaica, but not in Cuba.

We stopped on one occasion at Isle Tortue. I went ashore in the morning and passed word around that we would be back in the latter part of the afternoon prepared to purchase what might be forthcoming, explaining what we wanted. I had a sack of Haitian five-cent pieces on board the yacht. We found that we got much better results from our collectors if we ourselves did not stay where they could watch us. It was so much more fun to stand and stare at strangers than it was to do anything else that the temptation was quite overwhelming. But if we went ashore in the morning and spread the news of what we were prepared to do, then disappeared on board and hauled up the gangway, by the middle of the afternoon we could go ashore and be overwhelmed by the rabble of men and women, boys and girls, with snakes and lizards dangling at the ends of dozens of little lassoes which they fashioned cunningly from shredded palm leaves". BARBOUR's daughter Louisa recalls going to Beata and Saona on "snake buying expeditions . . . We went in on the ship's 'port launch' which was shallow draughted enough for us to get close to the beach. Swarms of children immediately waded out – holding their shirts up almost over their heads, and obviously delighted at the prospect of being paid 1 cent a foot for any snake they brought out for us. We went back to the Utowana – had the usual absolutely delicious lunch – and then we returned to the beach. There were swarms of children – each clutching one or more sticks – to which were tied (with grass) a snake. My father of course was thrilled . . ." (in litt. to RWH; August 1999).

In the paper describing the material he obtained during the Bahamian portion of the 1934 voyage, BARBOUR elaborated on the market technique even more (BARBOUR & SHREVE 1935): "The repeated short visits to some of the Bahama Islands and La Gonave [Haiti] are accounted for by the fact that we knew of responsible persons at these points who were willing to take containers and distribute cash rewards for specimens off lists given them of forms especially desired. The Bahamian and Haitian natives are excellent observers and ingenious captors of lizards and the like. . . From every point of view this is the most fruitful, as well as the most economical method of collecting from a vessel".

This technique has been used very successfully by herpetologists working in the West Indies subsequent to BARBOUR, and it is used today. Mention of its effectiveness has been made in SCHWARTZ & HENDERSON (1991), DUELLMAN et al. (1993), and HENDERSON & POWELL (1999). One of us (RWH) was instructed in the most efficient methods for establishing reptile markets by Albert SCHWARTZ (1923–1992), the most prolific describer of West Indian frog and reptile taxa, and the

methods he described were virtually the same as those used by BARBOUR, especially stressing not staying in the immediate area after giving the locals instructions as to what animals were desired. In Haiti and the Dominican Republic, this method has produced dozens of vertebrate-eating snakes in a matter of hours (HENDERSON & POWELL 1999), and Schwartz was inundated with 955 *Typhlops pusillus* BARBOUR, 1914 in about 36 hours at a site in the Dominican Republic (SCHWARTZ & HENDERSON 1991). C. Rhea WARREN (in litt. and pers. comm.), collecting on behalf of SCHWARTZ, made four trips to Île de la Tortue between 1968 and 1971, 34–37 years after BARBOUR was there. A total of seven days was spent on Tortue during WARREN's four trips. The harvest consisted of 1,197 specimens of frogs and squamate reptiles, about half of which were products of markets. According to WARREN, the residents of Tortue would most often bring him those species that commanded the most money (snakes), and not necessarily those species that were more nondescript, were smaller and, therefore, more easily overlooked, but that would more likely prove to be new to science.

This technique, utilized effectively by BARBOUR and subsequent herpetologists, has today been appropriated by commercial collectors. High prices offered reinforce the already prevalent attitude of wildlife merely as a commodity to be exploited (POWELL 2003). Further, these recent developments complicate efforts by scientists seeking often vital assistance from local inhabitants by both driving up the price and causing responsible authorities, all too aware of the abuses, to hesitate when asked to issue scientific collecting permits to legitimate investigators (see also HEDGES & THOMAS 1991 and HEDGES 1999). At the time of the *Utowana* voyages, however, the threat of commercial exploitation was not yet a problem.

6. THE HERPETOLOGICAL LEGACY OF THE UTOWANA IN THE WEST INDIES

Underestimating BARBOUR's contributions to West Indian herpetology would be a disservice to BARBOUR and to his herpetological accomplishments. Two books focused on West Indian herpetology have appeared in recent years. That edited by POWELL & HENDERSON (1996b) featured 28 papers (each with a Literature Cited section) on a wide array of subjects, from history and biogeography to ecology and conservation, and nearly 30% of the papers cited one or more of BARBOUR's papers. The other volume (CROTHER 1999) had a single combined Literature Cited section, which included 21 papers by BARBOUR. Thus, nearly 60 years since the publication of his last technical paper dealing with the West Indian herpetofauna, his work still is read widely and cited routinely. Furthermore, as of this writing (November 2003), only Albert SCHWARTZ, E. D. COPE, Richard THOMAS, S. Blair HEDGES, and Orlando GARRIDO have described more currently recognized species of West Indian frogs and reptiles (Table 1).

Tab. 1: The top ten describers (including co-descriptions) of currently recognized species of endemic West Indian frogs and reptiles, based on information in POWELL & HENDERSON (1996: Table 1; 1999; 2003).

Name (publication years)	Anurans	Turtles	Squamates	Total
A. SCHWARTZ (1957–1985)	44	0	43	87
E. D. COPE (1861–1895)	10	0	53	63
R. THOMAS (1965–)	10	0	42	52
S. B. HEDGES (1987–)	17	0	27	44
O. H. GARRIDO (1972 –)	0	0	42	42
T. BARBOUR (1910–1942)	9	1	30	40
D. M. COCHRAN (1923–1942)	11	0	23	34
G. BIBRON (1836–1881)	3	0	29	32
A. M. C. DUMÉRIL (1836–1854)	3	0	26	29
B. SHREVE (1936–1968)	11	0	13	24

Conversely, WILLIAMS (1999) described BARBOUR as "a special mixture of the professional and the dilettante". Based on his technical and popular writings, he did not seem to work terribly hard in the field or the lab. One gets the impression that once a project was initiated, he wanted to complete it as quickly as possible, and not necessarily as well as possible. WILLIAMS (1999) referred to him as the most conspicuous West Indian herpetologist of the first half of the 20th century, and he stated that "I use conspicuous in its invidious sense". Benjamin SHREVE (1908–1985), a longtime colleague of Barbour's and co-author of several papers based on material collected during the *Utowana* expeditions, complained to WILLIAMS that he (SHREVE) "did the spade work, and BARBOUR did the florid introductions; Barbour was always the first author" (WILLIAMS 1999).

Based on BARBOUR's own accounts of his participation on the *Utowana* voyages, one gets the impression that he was concerned as much with his comfort as with the collecting of biological materials. During a stop in the Swan Islands in 1933, BARBOUR (1945) wrote that "I . . . put in my time shooting some white crowned pigeons for our larder. They were certainly most excellent to meet at table". On the same voyage, in the Canal Zone, after quoting his daughter's reaction to eating *Iguana iguana* Linnaeus, 1758 for the first time, BARBOUR (1945) went on to say that, "This serves to show that we were nothing if not exploring gastronomically speaking. Allison and I had often enjoyed iguana stew before . . . It is as good as terrapin which it most resembles for all reptile meat tastes very good and all species are much alike in flavor". The most blatant example of his con-

cern about the next main course followed immediately after his doomsday prediction regarding the demise of *Cyclura cornuta* on Isla Beata: "I may add that the fishing off the west coast of the island near our anchorage was splendid" (BARBOUR 1945).

The West Indian *Utowana* expeditions produced three "major" publications. Two were largely taxonomic (COCHRAN 1934; BARBOUR & SHREVE 1935) and the third (BARBOUR 1930b) was conservation oriented and fraught with misinformation (see below). The two taxonomic papers provided descriptions of only six currently recognized West Indian species (Table 2), a surprisingly low figure considering the number of new species that have been described subsequently from the Bahamas, Cuba, Hispaniola, and the Lesser Antilles. However, Doris M. COCHRAN (1898–1968), curator of herpetology at the National Museum of Natural History (Smithsonian Institution), was in the process of writing "The Herpetology of Hispaniola" (1941), and BARBOUR generously turned the Hispaniolan material (17 frogs, 475 lizards, and 88 snakes) over to her. "It was most gratifying to find that when Dr. COCHRAN's paper appeared no less than one new genus and seven new species and subspecies had been found in this area which has been most intensively explored during the last decade" (BARBOUR & SHREVE 1935).

How can we explain the relative paucity of new species in BARBOUR's material? We believe that it can be attributed largely to the strategy of relying too extensively on reptile markets during ephemeral stops at islands, as opposed to making more prolonged visits involving more extensive explorations that would have generated many more opportunities to encounter the desired quarry firsthand. Of equal or greater importance as explanation for the dearth of new species was the fact that, by working from a boat, BARBOUR's markets were established at or near sea level. The herpetofauna at that low elevation had already been largely described, and the species-rich upland fauna on, for example, Hispaniola, was not sampled by BARBOUR's collectors. On the other hand, as one considers the itinerary of the *Utowana* in, for example, 1934 (the voyage BARBOUR considered the most productive; BARBOUR & SHREVE 1935), the number of ports that were visited, and the abbreviated stay at each of them (Figs. 4 and 5), the establishment of sea level markets may have been the only option for efficiently sampling the herpetofauna.

BARBOUR may nevertheless be faulted for sometimes using the market technique to the evident exclusion of personal encounters with the West Indian fauna. Much is to be said for seeing a creature in its natural surroundings and, if possible, spending some time observing it. Richard THOMAS (1996), speaking of Albert SCHWARTZ, noted that, ". . . the most important thing I learned from Al was the importance of having first-hand knowledge of animals on which you work, including the habits, color in life, habitats, and physiography of the areas they inhabit" and that the "insight from this knowledge is extremely important for the resolution of taxonomic problems".

BARBOUR has been criticized for his obvious lack of hands-on field experience with particular species, subsequently declaring them rare or even on the brink of extinction without adequate, and certainly not personally acquired, evidence. For example, he considered the arboreal Hispaniolan colubrid *Uromacer catesbyi* (Schlegel, 1837) a "widespread but rather rare species" (BARBOUR 1930a, 1935, 1937). CURTIS (1947), correctly noting that *U. catesbyi* is both widespread and common, chastised BARBOUR explicitly for his collecting (or accumulating) techniques. Similarly, BARBOUR (1930a, 1935, 1937) stated that the boid *Epicrates striatus* (Fischer, 1856) on Hispaniola "seems to be really uncommon". Again, CURTIS (1947) indicated correctly that in many lowland areas, *E. striatus* is extremely common. CURTIS proceeded to explain that, "Many blacks here [Haiti] keep snakes in captivity, but seldom show them to strangers". Our work on Hispaniola over the past 25 years (1979–present) indicates that *E. striatus* and *U. catesbyi* remain widespread and common on the island.

BARBOUR (1945) several times discussed the status of *Cyclura cornuta* on Isla Beata, lamenting the paucity of juveniles, and forecasting the demise of the species on that island. RWH visited Isla Beata in 1988, nearly 60 years after BARBOUR's first visit. *Cyclura cornuta* was still extant on the island, and Dominican naval personnel stationed there informed him that the large colubrid snake *Alsophis anomalus* (Peters, 1863) preys on hatchling iguanas as they emerge from nests on the beach. POWELL et al. (2000) went so far as to suggest that the population of *C. cornuta* on Isla Beata may be at or near pre-Columbian numbers.

BARBOUR (1930c) determined that the endemic Barbadian lizard *Anolis extremus* Garman, 1888, was "almost if not quite extinct". LAZELL (1972), noting that the species "is infradispersed, utterly ubiquitous, and exceedingly abundant all over Barbados", commented on BARBOUR's observation: ". . . that remark must certainly stand as one of the great verbal monuments of all time, but whether to a lizard's incredible fecundity, or a man's incredible myopia, I cannot be sure". In each of his three lists of Antillean amphibians and reptiles, BARBOUR (1930a, 1935, 1937) doubted that the endemic tree boa *Corallus cookii* Gray, 1842 still survived on St. Vincent, but efforts by RWH to collect the species on St. Vincent a half century later indicated that these snakes were widespread and locally abundant

Tab. 2: West Indian taxa the descriptions of which were based on specimens collected during the *Utowana* expeditions.

Taxon (current name)	Year of Expedition	Original Description	Patronym for
Eleutherodactylus audanti (unchanged)	1934	COCHRAN (1934)	André AUDANT
Ctenosaura similis multipunctata (*Ctenosaura similis*)	1933	BARBOUR & SHREVE (1934)	
Audantia armouri (*Anolis armouri*)	1934	COCHRAN (1934)	Allison V. ARMOUR
Anolis allisoni (unchanged)	1928	BARBOUR (1928)	Allison V. ARMOUR
Anolis dominicensis juliæ (*Anolis distichus juliae*)	1934	COCHRAN (1934)	Julia BARBOUR
Anolis fairchildi (unchanged)	1934	BARBOUR & SHREVE (1935)	David FAIRCHILD
Anolis leucophaeus sularum (*Anolis scriptus sularum*)	1934	BARBOUR & SHREVE (1935)	
Anolis smaragdinus (unchanged)	1934	BARBOUR & SHREVE (1935)	
Ameiva chrysolaema woodi (unchanged)	1934	COCHRAN (1934)	Corey F. WOOD
Ameiva rosamondæ (*Ameiva taeniura rosamondae*)	1934	COCHRAN (1934)	Rosamond BARBOUR
Leiocephalus carinatus armouri (unchanged)	1934	BARBOUR & SHREVE (1935)	Allison V. ARMOUR
Leiocephalus carinatus helenæ (*Leiocephalus punctatus*)	1934	BARBOUR & SHREVE (1935)	Helen GREENWAY
Leiocephalus carinatus picinus (*Leiocephalus punctatus*)	1934	BARBOUR & SHREVE (1935)	
Leiocephalus greenwayi (unchanged)	1934	BARBOUR & SHREVE (1935)	James C. GREENWAY, Jr.
Leiocephalus loxogrammus parnelli (unchanged)	1934	BARBOUR & SHREVE (1935)	Rev. Denis PARNELL
Leiocephalus personatus louisæ (*Leiocephalus lunatus louisae*)	1934	COCHRAN (1934)	Louisa BARBOUR
Epicrates reliquus (*Epicrates chrysogaster reliquus*)	1934	BARBOUR & SHREVE (1935)	
Alsophis vudii aterrimus (unchanged)	1934	BARBOUR & SHREVE (1935)	
Alsophis vudii raineyi (unchanged)	1934	BARBOUR & SHREVE (1935)	Froelich RAINEY
Alsophis vudii utowanæ (unchanged)	1934	BARBOUR & SHREVE, (1935)	the yacht, *Utowana*
Dromicus parvifrons rosamondæ (*Antillophis parvifrons rosamondae*)	1934	COCHRAN (1934)	Rosamond BARBOUR

(HENDERSON 1998; 2002). In addition to his checklists, BARBOUR (1930b) produced a paper specifically describing faunistic changes in the Lesser Antilles. Despite the fact that he stated that ". . . these notes are based on as wide a personal acquaintance as is ever likely to fall to the good fortune of a single person", the paper is remarkably misleading about a great many taxa. A species-by-species account of his three lists and the faunistic paper would add many more examples of BARBOUR's misinformation regarding the rarity or abundance of specific amphibians and reptiles.

Considering the potential for what could have been accomplished by BARBOUR and his companions on the *Utowana* voyages, especially given the time of the expeditions and their itineraries, the results were disap-

pointing. With more time devoted to firsthand collecting, BARBOUR undoubtedly would have left the islands (especially those associated with Hispaniola) with a great many more new species, and a much more accurate perspective on the status of reptilian populations on each of the islands. The *Utowana* collections remain, nevertheless, extremely valuable. They contain long series of some species and therefore are useful in documenting geographic variation and acquiring ecological data (e.g., dietary analyses, reproductive biology).

Like EKMAN, BARBOUR returned from his trips with large numbers of specimens. Unlike EKMAN, however, he did not come to know the area in detail and, in fact, was occasionally guilty of drawing faulty conclusions about the natural history and relative abundance of species he never personally encountered in the field. Also unlike EKMAN, he did not die an untimely death as a consequence of his time in the West Indies. Instead, BARBOUR wisely may have taken advantage of a unique opportunity to explore relatively risk-free a but poorly known region of the world in a time before adequate, much less safe housing, ready access to healthy water, and modes of reliable land transportation were available. Consequently, detractors of BARBOUR's methods should pause before rendering their criticisms. His many contributions to West Indian herpetology are undeniable.

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