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OBSERVATIONS ON THE BUTTERFLIES OF GREAT INAGUA ISLAND, BAHAMAS, WITH RECORDS OF THREE SPECIES NEW TO THE ISLAND

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INTRODUCTION

Clench and Bjorndal (1980) recorded 34 species of butterflies from Great Inagua and 19 species from Little Inagua in the southern Bahamian islands, that had previously been little collected. Recently we have been able to conduct additional field work on Great Inagua, and the following observations are meant to augment the work of Clench and Bjorndal and present a new overall account of the butterfly fauna of the island.

During May 1984 and October 1985, we visited Great Inagua for a week each month, searching for butterflies to complement those previously taken. On the first trip we took 23 species, including one that was unrecorded, and the second trip yielded 27 species (one of these was a positive sight record), including another two species, both vagrants, that had not been recorded previously from Great Inagua. These records bring to 37 the number of species known from the island; Clench and Bjorndal (1980: 11) state that on the basis of area, one might expect 48 species. They attribute the depauperate fauna in part to the extreme (for the Bahamas) aridity (rainfall of approximately 28 inches [=71 cm.] per year) on this island. However, certain vagrant species, such as *Electrostrymon angelia angelia* (Hewitson), present in numbers on North Caicos, and the almost ubiquitous *Dryas iulia carteri* (Riley), still have not been recorded from there, and the addition of these to the Inagua list might bring the total number of species much closer to the theoretical number. Nonetheless, now the actual number of species recorded is greater than 75% of the theoretical one.

Great Inagua is difficult to reach, and the island has few good roads. Clench and Bjorndal (1980: 1) were correct in their opening statement: "Even to Bahamians, the Inaguas are a long way off." The logistics of travel there usually entail a layover in Nassau, because no airplane from the mainland arrives there until after the Nassau-Inagua flight has left. Once one is in Matthew Town, however, the Inaguans are friendly and helpful and a rental

vehicle or guide can usually be found. Travel around the island is slow: one does not speed on Inaguan roads. Seldom did we travel at as much as 40 mph, and that only on the blacktopped road (one mile) between Matthew Town and the airport. These comments are not to indicate that we did not enjoy our stay there: the Inaguans make all who visit very welcome.

There is no permanent human habitation on Great Inagua outside the environs of Matthew Town, which is located on the southwest tip of the island. There is basically one employer in Matthew Town, Morton Bahamas Ltd., and the economy is based in large part on the salt industry and related services. In the past there were some small farmsteads, no longer occupied on a permanent basis, and the main evidence that agricultural activity ever existed in the area are small stands of coconut palms (*Cocos nucifera* L.), which are the largest trees on the island.

Collecting was done strictly on the west side of the island because the only roads passable to a two-wheel drive vehicle were there, but Clench's experience indicated that the east side is merely drier and slightly higher than is the west with fewer butterflies. Therefore, we feel that we adequately sampled the island for the butterflies present each time. There was only one species, *Chlorostymon maesites maesites* (Herrich-Schäffer), for which we have a sight record on one trip. Although this species was seen only once in 1985, many observations were made in 1984, and the record is supported by specimens collected previously by other investigators.

A history of collecting activity in the Inaguas is given by Clench and Bjorndal (1980: 2-3), and it appears that our total of 28 species collected is in accord with those of most other visits of similar duration. In addition to those species taken by us but not by previous collectors, there were several: *Danaus gilippus berenice* (Cramer), *Anartia jatrophae saturata* Staudinger, *Euptoieta claudia* (Cramer), *Strymon limenia* (Hewitson), *Eurema nicippe* (Cramer) and *Pyrgus oileus oileus* (Linnaeus), that we might have expected, but which were never encountered. Several of these well-known dispersalists (as are *Vanessa cardui* (Linnaeus) and *Urbanus proteus* (Linnaeus) and perhaps its West Indian subspecies *domingo* (Scudder) that we did encounter) might form transient colonies that last for varying periods of time, then die out and require reintroduction. Thus, the butterfly fauna of this island might be composed of no more than 40 species at any one time, even though the total number of species recorded from there might be significantly higher.

Localities Checked by Simon and Miller, 1984, 1985

The localities where we spent most of our time were all on the western part of the island, seldom more than 2 miles (3+ km.) from the coast. Areas further inland just tended to be drier and less inviting for butterflies and collectors alike.

1. Matthew Town and vicinity. Some collecting was done in vacant lots in the town itself. A few "weedy" species were taken there (*Eurema elathea*, *E. lisa euterpe*, *Kricogonia lyside*, *Euptoieta hegesia*, *Leptotes cassius theonus*, *Ascia monuste eubotea*), but some species encountered by Clench there, especially *Eurema nicippe* (Clench and Bjorndal, 1980: 22), were not found either year. Occasional papilionids could be seen in the town proper and close to it (see below).

2. Horse Pond, ca. 1.5 km. northeast of Matthew Town. This is one of very few fresh water ponds on the island. It has served as a water supply area in the past and the remains of a small pumping station are evident. There was a profusion of vegetation around the pond, and it was here only that good growths of *Phyllis* flowers were found. It was a favorite spot for *Junonia* and *Eurema lisa euterpe*, which we took only there, and for *Strymon limenia* and *Anartia jatrophae saturata* which we missed, but which were recorded by Clench and Bjorndal (1980).

3. Town Salt Pan on the northern boundary of Matthew Town. This area was favored by only a few species (*Panoquina p. panoquinoides* and reportedly *Brephidium exilis barbouri*), but we found collecting there to be very poor both years despite the best growth of hypersaline plants seen on the island.

4. The area of coastal scrub between Matthew Town and the Salt Works. This is about

a seven mile (11 km.) stretch of road that passes through coastal vegetation that varies from open forest to dense scrub to arid, rocky habitats. The tallest trees were about 20 feet (7 m.) tall. The best areas for collecting were those that were more heavily wooded, and individuals of most of the species were seen there, including *Heracles aristodemus bjorndalae*.

5. Man-o-War Bay. Here were several localities lumped into one. Adjacent to the coast was typical scrub dominated by Bay Cedar (*Suriana maritima* L.) where most of the hairstreaks and the first records of *Vanessa cardui* were collected. Close to this was what we were told was Calf Pond, a saline pond 200 m. from the coast. Karen Bjorndal (pers. comm.) told us that this was not "her" Calf Pond (see Clench and Bjorndal, 1980, for details). The real Calf Pond was named because a group of hunters from Matthew Town found a feral calf alongside a hitherto unsuspected fresh water pond, ate it and immortalized it in the name of the pond. Actually, there are four such ponds inland about a 45-minute walk from the coast through a coppice south of the saline pond that we mistook for Calf Pond. We approached these areas both in 1984 and 1985, but collecting was not as good as nearer the coast, and we spent very little time there. A second pond labelled as the *salina* is located between Northwest Point and the Salt Works. It was from this area that the first island record of *Strymon acis* subsp. came. The material labelled as "Man-o-War Bay, nr. Calf Pond", was collected from the coppice south of the *salina*, about 1 km. west of Calf Pond. This area was doubtless the richest that we encountered, and it was here that the first *Urbanus proteus domingo* was collected; the area harbored the largest populations of *Heracles aristodemus bjorndalae* and *Memphis intermedia*, among other species.

SPECIES ACCOUNTS

Actual records are given here only for the material collected by the authors: the only other records that we know of are summarized in Clench and Bjorndal (1980).

Family Danaidae

Danaus plexippus megalippe (Hübner 1826)

This subspecies is figured by Riley (1975: pl. 1, fig. 1) and was encountered by us sparingly and only along the coastal strand near Man-o-War Bay. Clench and Bjorndal (1980: 13) give substantially the same data, and like them, we only found the non-migratory form. The butterflies were not particularly attracted to any flowers that we saw, though Simon did notice individuals briefly visiting low purple flowers in the coastal scrub.

Records: Man-o-War Bay, near Calf Pond, x.1985.

Danaus gilippus berenice (Cramer 1779)

This subspecies is figured by Riley (1975: pl. 1, fig. 3b) and was cited by Clench and Bjorndal (1980: 14) as being "locally uncommon, perhaps erratic in appearance". We presume that this assessment is correct, but we never saw the species despite frequent visits to both sites mentioned by Clench and Bjorndal. This species might be one that forms occasional ephemeral populations, but data on mass movement of this species are lacking.

Family Nymphalidae

Agraulis vanillae insularis Maynard 1889

The species is figured by Riley (1975: pl. 9, fig. 3) and discussed by Clench and Bjorndal (1980: 17). Surely this species is not the most abundant butterfly on Great Inagua, as intimated by the latter authors, though it probably is elsewhere in the Bahamas, nor the most widespread on the island (that title must go to *Kricogonia lyside*), but we did find it common in most places. In 1984, most specimens were seen between the Salt Works

and Matthew Town, but in October of 1985, we saw them commonly at all stations. The adults nectared sporadically on most flowers, such as *Phyla*, *Lantana* and *Cordia*.

Records: Horse Pond, ca. 1.5 km. NE of Matthew Town, v.1984, x.1985. 5 km. S of Salt Works, v.1984. Man-o-War Bay near Calf Pond, v.1984, x.1985.

Euptoieta claudia (Cramer 1776)

Figured by Riley (1975: pl. 8, fig. 8), all that is known about this species in the Inaguas is summarized by Clench and Bjorndal (1980: 16). We did not encounter it, despite having examined hundreds of *E. hegesia* (see below). In North America, this species tends to be reintroduced into places where it cannot survive the winter, and we surmise that it would be an occasional vagrant on Great Inagua.

Euptoieta hegesia hegesia (Cramer 1779)

This species is discussed by Clench and Bjorndal (1980: 16-17) and figured by Riley (1975: pl. 8, fig. 7). It was abundant in all localities, especially disturbed ones, excluding the hypersaline ones and was an avid flower visitor, coming to almost any plant that was in bloom. Its flight is leisurely, suggesting that perhaps Clench and Bjorndal were correct in postulating a mimetic relationship revolving around the aposematic *Agraulis vanillae insularis*.

Records: Horse Pond, ca. 1.5 km. NE of Matthew Town, v.1984, x.1985. 4 mi. N of Matthew Town, x.1985. 4 km. S of Salt Works, v.1984. Man-o-War Bay, near Calf Pond, x.1985. Calf Pond, v.1984.

Vanessa cardui (Linnaeus 1758)

This species is here recorded for the Inaguas for the first time. This is not surprising because *cardui* is a well-known migrant, being one of the few butterflies that has reached Bermuda (Riley 1975: 82, 200). Elsewhere in the Bahamas it is recorded as a vagrant (Riley 1975: 200; Clench unpublished). A small number of specimens was seen near Northwest Point, and those that were taken were definitely badly worn indicating a rather long trip. The specimens were taken in open coastal scrub within sight of Man-o-War Bay. No apparently suitable foodplant was noted where the butterfly was flying, and it is unlikely that a colony would develop on the island. *V. cardui* is illustrated by Riley (1975: pl. 8, fig. 1).

Records: Man-o-War Bay, near Calf Pond, x.1985.

Anartia jatrophae saturata Staudinger 1884

This insect is figured by Riley (1975: pl. 7, fig. 5) and discussed by Clench and Bjorndal (1980: 16). The latter state that it is "local and at times common", especially at Horse Pond. Repeated visits to that locality and others yielded neither specimens nor sight records, and since this species is well-known for establishing colonies which then die out in peninsular Florida, we must assume that this insect was not present when we were there but probably will be reintroduced in the future.

Junonia evarete zonalis C. and R. Felder, 1867

This species is figured by Riley (1975: pl. 8, fig. 5), but the subspecies illustrated is *michaelisi* Munroe; Clench and Bjorndal (1980: 15) discuss it. *J. e. zonalis* was not encountered by us, even though it is considered commoner than *J. genoveva* (see below).

Junonia genoveva (Cramer 1780)

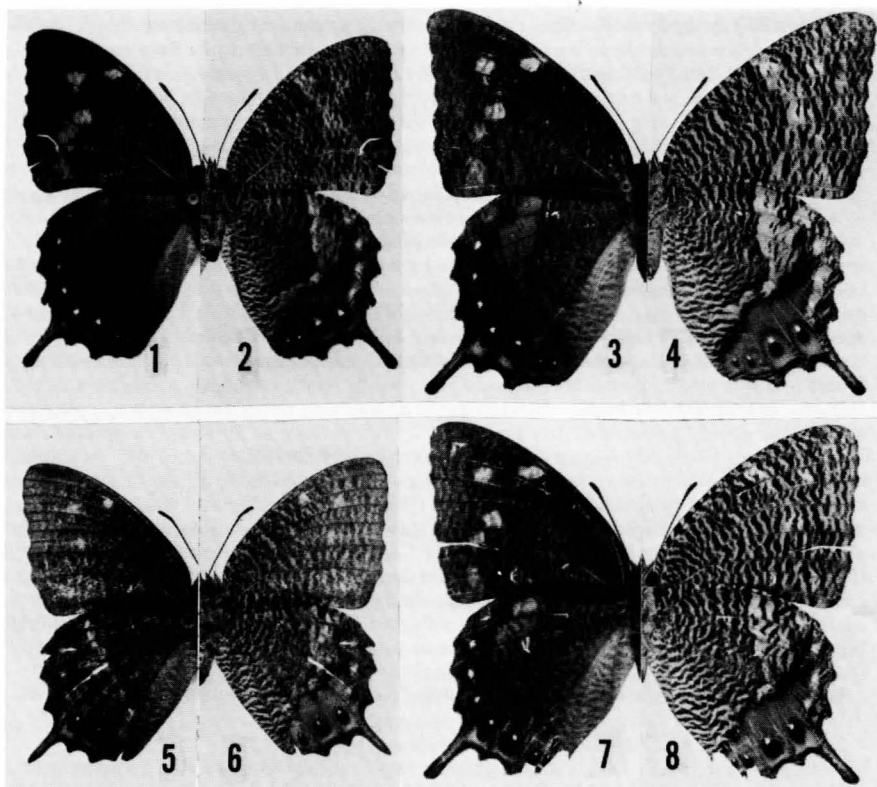
This species is not illustrated by Riley (1975), who lumped it with the preceding. Clench and Bjorndal (1980: 15) discuss the specimens taken by Worthington and Bjorndal near Northwest Point seventy years apart, and we located a few examples near Matthew Town.

The flight of the butterflies was nervous, and the only specimens that could be collected were nectaring on *Phyla* flowers. This could be a migratory butterfly (certainly many other *Junonia* are), but we cannot speculate further on the possibilities of introduction, extirpation and reintroduction based on our limited observations.

Records: Horse Pond, ca. 1.5 km. NE of Matthew Town, x.1985.

Memphis intermedia (Witt 1972)

Riley (1975: pl. 4, fig. 10) figures this species and the discussion by Clench and Bjørndal (1980: 14-15) suggests the possibility that it is a subspecies of *M. verticordia* (Hübner, 1824), based on an unpublished Clench manuscript. We prefer to follow Witt (1972), and further we are associating this species with the genus *Memphis* [1819] in accordance with modern taxonomy of the Charaxini. Recently Okano (1985) described the Great Inagua populations under the name *Anaea* (*Memphis*) *intermedia mineae* as distinct from nominate *intermedia* from Turks and Caicos because of its clearer yellow upper forewing submarginal



Figures 1-8: *Memphis intermedia* (Witt), all from Man-o-War Bay, Great Inagua Island, Bahamas. 1-2: ♂ upper (1) and under (2) surfaces; form "mineae" (Okano), v.1984 (Allyn Museum photo numbers 860320-4/5). 3-4, same form, ♀ upper (3) and under (4) surfaces, v.1984 (Allyn Museum photo numbers 860320-6/7). 5-6, ♂ upper (5) and under (6) surfaces; typical form, x.1985 (Allyn Museum photo numbers 860320-8/9). 7-8, same form, ♀ upper (7) and under (8) surfaces, x.1985 (Allyn Museum photo numbers 860320-10/11). All specimens figured at magnification of 1.11x. Unless otherwise indicated all specimens illustrated are from the Allyn Museum collection.

spots and the well-developed whitish median shade on the under hindwing. Many specimens collected during May, 1984, tended to support the under surface pattern characteristic cited by Okano, though a few specimens showed a pattern reminiscent of that illustrated by Okano for Caicos material. The upper side spots in our series differed from the Caicos specimens ranging from clear yellow to chestnut yellow. Material collected in October, 1985, however, is identical with Turks and Caicos material on both surfaces, especially the lack of development of the median pale band on the under hindwing. It appears that there is seasonal dimorphism in this characteristic, perhaps even in Turks and Caicos (most specimens of *intermedia* were taken in December and January). Such seasonal polyphenism is by no means uncommon in charaxines. Therefore, we can see no significant difference between *intermedia* and *mineae* attributable to other than seasonal polymorphism and must place *mineae* in the synonymy of *intermedia* [New Synonymy]. Male and female examples of these forms are illustrated in Figures 1-8.

This butterfly is very sporadic in its appearance. In May 1984 it was abundant and very easy to bait with rotten fruit. Literally hundreds of specimens were seen at that time in more or less dense woodlands, with fewer individuals in more open situations. During October 1985 the species was almost absent with no concentrations encountered. At this time, they were much shyer and were very difficult to capture at baits.

Records: 0-2 km. N of Matthew Town, v.1984. Man-o-War Bay, near Calf Pond, v.1984, x.1985.

Family Lycaenidae

Strymon acis subspecies

A single specimen collected on the shores of the salinas near Man-o-War Bay (which we thought was Calf Pond) is the first record for this species from Great Inagua. It was taken on a Black Mangrove (*Avicennia maritima* Jacq.) flower. The presence of this species on the island was listed as possible by Clench and Bjørndal (1980: 11) on the basis of specimens from Turks and Caicos. This is not *S. acis armouri* Clench 1943; rather it is more similar to the Hispaniolan *S. a. petioni* Comstock and Huntington 1943. It was not found in 1985.

Records: Calf Pond, v.1984.

Strymon martialis (Herrich-Schäffer 1864)

This distinctive species is figured by Riley (1975: pl. 11, fig. 11) and discussed at some length by Clench and Bjørndal (1980: 17-18). It is most abundant along the coast, almost always in association with its foodplant, Bay Cedar, and most specimens were collected from the foliage of this plant. *S. martialis* was common during May 1984, but was scarce in October 1985. This decided seasonality is similar to that observed in the Florida Keys, with specimens there being most easily collected during the winter (dry season). The butterflies were not common at most flowers that were ordinarily attractive to other lycaenids.

Records: Calf Pond, v.1984. Man-o-War Bay, near Calf Pond, v.1984, x.1985.

Strymon columella cybira (Hewitson 1874)

Figured in Riley (1975: pl. 12, fig. 4) and discussed by Clench and Bjørndal (1980: 18), this species was very common in May, 1984, decidedly less so (along with all other theclines) in October, 1985. Most specimens were collected at flowers, especially those of Sea Grape, *Zizyphus* (*Zizyphus taylori* (Britt.) M. C. Johnston) and Wild Sage (*Lantana involucrata* L.) and on the foliage of Bay Cedar along with *S. martialis*. Surprisingly few specimens were seen any time at Horse Pond (see Clench and Bjørndal, 1980: 18), where Clench took many examples.

Records: 0-2 km. N. of Matthew Town, v.1984. Horse Pond, ca. 1.5 km. NE of Matthew Town, v.1984. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Strymon limenia (Hewitson 1868)

This insect is illustrated by Riley (1975: pl. 12, fig. 5) and discussed by Clench and Bjørndal (1980: 18). It was discovered on the island in 1977 by Clench, but we never took a specimen, despite several attempts to find it at Horse Pond where Clench took his representatives. This butterfly has propensity for movement, as shown by the Key West material recorded by Anderson (1974). Perhaps it disappeared between 1977 capture of Clench's specimens and when we collected on Great Inagua.

Chlorostymon maesites maesites (Herrich-Schäffer 1864)

This very distinctive little hairstreak is discussed by Clench and Bjørndal (1980: 17) and illustrated by Riley (1975: pl. 11, fig. 8). The former authors record only two males from Matthew Town, though they did find it very common on Little Inagua. In May 1984 we found the species abundant near Calf Pond, south of the saline one, where the adults were nectaring in *Zizyphus* flowers. Several hundred examples were seen, and we thought perhaps we had found the "mother lode" for this butterfly. However, only a single specimen was seen by Miller, but not captured, at Horse Pond during October, 1985. It possibly is highly seasonal in its appearance; it is unlikely that it was overlooked as we specifically sought it.

Records: Horse Pond, x.1985 (sight record only.) Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984.

Leptotes cassius theonius (Lucas 1857)

This insect is figured by Riley (1975: pl. 12, fig. 10a) and discussed by Clench and Bjørndal (1980: 18-19), who recorded it as uncommon. It did not seem to be uncommon when we were there in May 1984, but it was in low population numbers in October 1985. Most specimens encountered were found at the edges of woods, frequently nectaring on a variety of low flowers.

Records: 0-2 km. N. of Matthew Town, v.1984. Horse Pond, ca. 1.5 km. NE of Matthew Town, v.1984. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984; x.1985.

Hemiargus ceraunus ceraunus (Fabricius 1793)

This insect is depicted as *H. hanno filenus* (Poey) by Riley (1975: pl. 12, fig. 12) and is described as "usually rather uncommon" by Clench and Bjørndal (1980: 19). Strangely we did not encounter it at all in 1984, whereas in 1985 it was the commonest lycaenid seen. It flies low and is rather inconspicuous, but this should not account for our not finding it the first trip. All specimens of *ceraunus* were taken in association with low flowers, those of *Phyla* being preferred at Horse Pond where it was most abundant.

Records: Horse Pond, ca. 1.5 km. NE of Matthew Town, x.1985. Salt Pan, NE edge of Matthew Town, x.1985. Man-o-War Bay, nr. Calf Pond, x.1985.

Hemiargus thomasi thomasi Clench 1941

A different subspecies is illustrated by Riley (1975: pl. 12, fig. 13), and Clench and Bjørndal (1980: 19) discuss it as an "undescribed subspecies." It was abundant on both trips, usually in open woods: certainly *thomasi* was the most consistently seen lycaenid. Many individuals were nectaring at flowers of *Zizyphus* during May, 1984, and at Cocobey (*Cordia bahamensis* Urb.) in October 1985. The flight is deceptively quick for a Blue, but the species is abundant enough that one need not worry if a specimen is missed: soon another will fly past. We cannot discern much difference between Inagua specimens and those from elsewhere in the Bahamas; hence, we are tentatively considering the Inagua ones as the nominate subspecies.

Records: 0-2 km. N of Matthew Town, v.1984. Horse Pond, ca. 1.5 km. NE of Matthew

Town, v.1984, x.1985. Salt Pan, NE edge of Matthew Town, x.1985. 5 km. S of Salt Works, v.1984. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Brephidium exilis barbouri Clench 1943

Figured by Riley (1975: pl. 12, fig. 17) and discussed by Clench and Bjorndal (1980: 20) as *B. e. isophthalma* (Herrich-Schäffer 1862), this species was only encountered once in the hypersaline area surrounding Calf Pond. Despite several visits to the Town Salt Pan area (see map in Clench and Bjorndal 1980: 4, for location), we never encountered it, and the single specimen collected was the only one we ever saw. It was in a patch of Saltwort (*Batis maritima* L.), and continued searching failed to reveal other specimens. We have both collected *Brephidium* elsewhere, and the habits do not differ much from one place to another.

Records: Calf Pond, v.1984.

Family Pieridae

Ascia monuste eubotea (Latreille 1819)

This butterfly is figured by Riley (1975: pl. 13, fig. 3 and text fig. 13) and discussed in some detail by Clench and Bjorndal (1980: 20-21). The latter state that the insect may be extremely common, but we certainly did not find this to be the case. They further state correctly that Inaguan specimens resemble those from Hispaniola rather than the Cuban ones. Specimens of this species were usually encountered singly and flying purposefully toward an unknown destination, thus rendering them rather difficult to capture.

Records: 0-2 km. N of Matthew Town, v.1984. 5 km S of Salt Works, v.1984. Man-o-War Bay, nr. Calf Pond, x.1985.

Phoebis sennae sennae (Linnaeus 1758)

This butterfly is figured by Riley (1975: pl. 17, fig. 1) and briefly discussed by Clench and Bjorndal (1980: 21). It was moderately common in all localities, but it usually flew high and fast and was very difficult to net. Very seldom were individuals observed at flowers.

Records: Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Phoebis agarithe antillia F. M. Brown 1929

This insect is figured by Riley (1975: pl. 16, fig. 6), thought he misspells the name as "antilla" and it is mentioned very briefly by Clench and Bjorndal (1980: 21). We found it to be commoner in all localities than *P. s. sennae*, and it occasionally came to flowers, especially Zizyphus and less frequently to Cocobey. Normally, it flew high and fast, thus eluding capture.

Records: 0-2 km. N of Matthew Town, v.1984. Salt Pan, NE edge of Matthew Town, x.1985 (specimen taken flying through the area; it was certainly not attracted to anything there). 5 km. S of Salt Works, v.1984. Man-o-War Bay, nr. Calf Pond, x.1985.

Kricogonia lyside (Godart 1819)

This species is figured in Riley (1975: pl. 13, fig. 9) and discussed by Clench and Bjorndal (1980: 21-22). It was by far the commonest butterfly on the island during both trips, and one could have collected several hundred a day if so inclined. It was seen at all stations. Many individuals could be seen nectaring on such diverse flowers as Bay Cedar, Zizyphus, Cocobey, Wild Sage and Sea Grape. This butterfly often distracted us from more desirable species.

Records: 0-2 km. N of Matthew Town, v.1984. Horse Pond, x.1985. 5 km. S of Salt Works, v.1984. Calf Pond, v.1984. Man-o-War Bay, v.1984, x.1985.

Eurema nicippe (Cramer 1779)

This species is figured by Riley (1975: pl. 14, fig. 6) and the only specimens taken on the island are recorded by Clench and Bjorndal (1980: 22). We did not encounter this well-known migrant and are certain that no permanent colony now exists on at least western Great Inagua.

Eurema elathea elathea (Cramer 1777)

Figured by Riley (1975: pl. 14, fig. 6) and considered "generally common" by Clench and Bjorndal (1980: 22), this species was seldom seen by us on Great Inagua, though it was encountered more often in October 1985, than in May 1984. It occasionally nectared on *Phyla*, but otherwise was seen flying singly through low herbage in open places. Females seemed commoner than males in our experience. Most specimens were seen in the environs of Matthew Town.

Records: Matthew Town, x.1985. 0-2 km. N. of Matthew Town, v.1984. Horse Pond, ca. 1.5 km. NE of Matthew Town, x.1985. Man-o-War Bay, nr. Calf Pond, x.1985.

Eurema lisa euterpe (Menetries 1832)

This species is figured by Riley (1975: pl. 14, fig. 7) and is classified as "moderately frequent" by Clench and Bjorndal (1980: 22-23). We did not encounter it at all in 1984, and the only locality where we saw it in 1985 was Horse Pond, where it was fairly common. Most specimens were taken on *Phyla* flowers.

Records: Horse Pond, ca. 1.5 km. NE of Matthew Town, x.1985.

Eurema chamberlaini inaguae Munroe 1950

This subspecies is not figured by Riley (1975), but it is unmistakable, being smaller than other Inagua *Eurema* and with a bright orange male and a yellow female. Clench and Bjorndal (1980: 23) discuss it in some detail. We encountered it most frequently in open woodlands where it habitually nectared on such flowers as *Zizyphus* and especially *Cocobey*.

Records: 0-2 km. N. of Matthew Town, v.1984. Salt Pan, NE edge of Matthew Town, x.1985. Horse Pond, ca. 1.5 km. NE of Matthew Town, v.1984, x.1985. 5 km. S of Salt Works, v.1984. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Family Papilionidae

We are accepting the generic nomenclature proposed by Hancock (1983) rather than placing the following two species in the omnibus genus *Papilio* Linnaeus, as is usually done.

Heraclides andraemon bonhotei (E. M. Sharpe 1900)

This race is not figured at all by Riley (1975), but it is illustrated, even if rather poorly, by Howe (1975: pl. 77, fig. 1). Clench and Bjorndal (1980: 23-24) list it as "uncommon to scarce", and it certainly was in May 1984. It was considerably more abundant in October 1985, but very difficult to capture as most individuals refused to nectar or to fly within net range. This butterfly flies rather low to the ground in a direct manner, and they can be intercepted in this way. Most of the specimens collected were in the Man-o-War Bay vicinity, though they were seen elsewhere.

Records: 5 km. S of Salt Works, v.1984. Man-o-War Bay, nr. Calf Pond, x.1985.

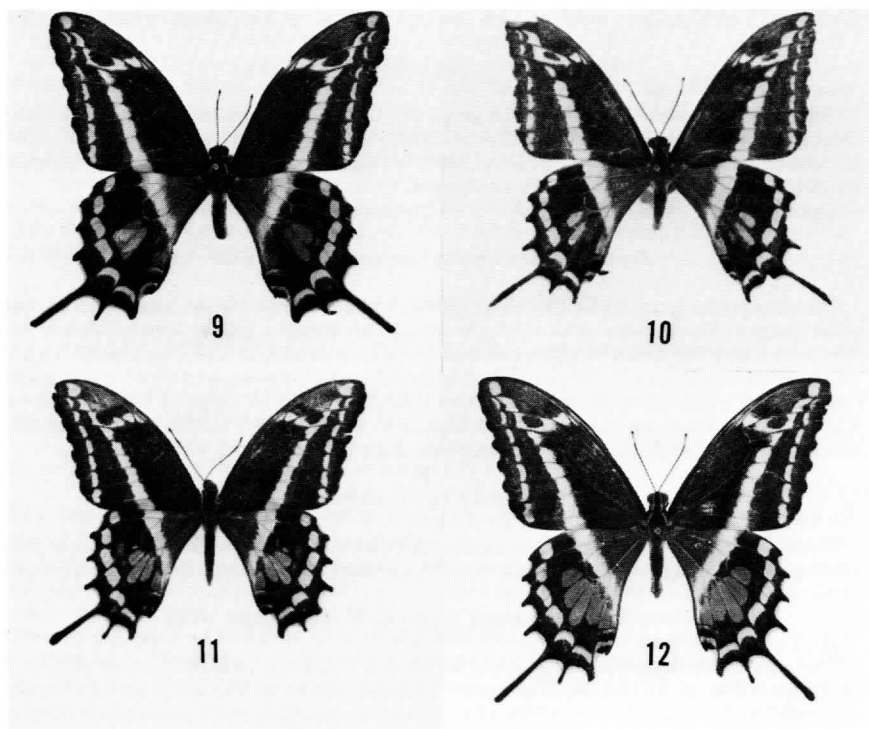
Heraclides aristodemus bjorndalae (Clench 1979)

Males of this insect are illustrated here for the first time (Figures 9-12), to show the full range of variation, and Clench and Bjorndal (1980: 24) considered it "apparently scarce"

as there were only two specimens known at the time. During May 1984 we certainly thought that *bjordalae* was scarce to rare, for we saw only two individuals, one of which Simon was lucky enough to capture. It seemed almost impossible that we might make any biological observations about the insect until we returned in October 1985.

A hurricane had brushed Great Inagua about ten days before we arrived on the island in October, and it had caused significantly more rain than normal to fall. The vegetation was prime during this period, and we returned to the Man-o-War Bay area where the previous trip had yielded our single specimen. A few males were seen, and every day at the site yielded more observations and a few specimens.

The hammock vegetation on Great Inagua is sparser than in the other *aristodemus* sites, the trees shorter, and the general aspect is drier. The only likely foodplant on the site was Torchwood (*Amyris elemifera* L.). Despite continuous searching, no examples of the



Figures 9-12: upper surfaces of representative ♂ specimens of *Heraclides aristodemus bjordalae* (Clench). All specimens were collected at Man-o-War Bay in the vicinity of Calf Pond. 9, x.1985 (Allyn Museum photo number 860320-13). 10, v.1984 (Allyn Museum photo number 860320-14). 11, x.1985 (Allyn Museum photo number 860320-12). 12, x.1985 in M. J. Simon collection (Allyn Museum photo number 860509-1). All specimens approximately 0.6x.

other possible foodplant, Wild Lime (*Zanthoxylum* sp.), were found. This is contrary to Simon's experience on North Caicos where Wild Lime was abundant and Torchwood rare. He saw oviposition on *Zanthoxylum* there (at this time), and it seems evident that *bjoernaldae* shares this foodplant with the much commoner (there) *H. andraemon bonhotiei*.

The butterflies seldom venture outside the dense hammock vegetation; hence, they are chipped almost immediately after they begin flying. Most of the specimens that we saw or caught, even though they apparently had been out only a matter of a few days, were badly chipped. The flight of males is irregular and bouncing, even when they cross an open space. This is in sharp contradistinction to the straightforward pattern of flight of *andraemon*, so the two species which otherwise look so similar easily may be distinguished on the wing with almost 100% certainty. Females of *bjoernaldae* (we only were certain that we saw a few) fly a more direct path and somewhat higher over the canopy (such as it is); they are very difficult therefore to capture.

In most *aristodemus* populations, the males will nectar rather freely, but those of *bjoernaldae*, in our experience, were not particularly attracted to flowers. A few individuals would nectar briefly at *Cordia* and especially at *Lantana* flowers. They would seldom stay on the plant beyond five to ten seconds, nervously flitting from flower to flower, then resume their characteristic flight patterns.

Based on the population at Man-o-War Bay, we began examining other sites for this supposedly "rare" butterfly, and saw individual specimens, but not large populations, throughout the western part of the island. These observations were culminated by our seeing a large female flying lazily through the back yard at the Main House just before we left the island (we had packed our nets away for the trip the night before). We cannot be certain whether all of these specimens were spill-overs from the Man-o-War Bay population or whether small populations exist over much of the island. Wherever we saw *bjoernaldae*, however, we also saw a few Torchwood, so the potential for a stable population exists almost everywhere, other than in hypersaline areas, at least along the west coast of the island.

Simon alone, and later in the company of Robert Aronheim, discovered a colony of *bjoernaldae* on North Caicos, as suggested earlier, and a few specimens have been collected on other islands of the Turks and Caicos group. These specimens are generally larger than Inagua specimens, perhaps reflecting the greater aridity on Great Inagua and the better quality of foodplant on Turks and Caicos. Examination of very short series of material from both islands seemed to show several points of difference between Inagua and Caicos specimens. The longer series now available from Great Inagua, however, demonstrated that the salient points of difference observed in Caicos specimens are well within the normal range of variation of the Inagua material. This shows the futility of trying to describe subspecies from short series, especially from island habitats which may even be seasonally highly variable.

Records: Horse Pond, x.1985. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, x.1985. Sight records also from areas between Salt Works and Matthew Town and in Matthew Town itself, x.1985.

Family Hesperidae

Epargyreus zestos inaguorum Clench and Bjorndal 1980

This subspecies was described by Clench and Bjorndal (1980: 24-26) and discussed in great detail. It is illustrated here for the first time (Figures 13-14). The sexes are similar, and all of the Inagua material consistently varies from other *zestos* in the characters enumerated in the original description. It occurs on both Inaguas and also on the islands of the Turks and Caicos group without further differentiation. This is the same situation as with *Memphis intermedia*, *Strymon acis* subspecies and *Heracles aristodemus bjoernaldae*. We found the insect very common in May 1984, and only somewhat less so in October 1985, usually in more or less wooded areas. It is an avid flower visitor, showing a great preference for *Avicennia*, *Zizyphus* and *Lantana*.

Records: 0-2 km. N of Matthew Town, v.1984. 5 km. S of Salt Works, v.1984. Calf Pond,

v.1984. Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Urbanus proteus domingo (Scudder 1872)

This species is here recorded for the first time from the Inaguas on the basis of a single specimen collected west of the saline pond near Northwest Point. The specimen was collected while it was nectaring on *Cordia*. A few more individuals were seen, but were not collected. The presence of this insect on Great Inagua is easily explained if *domingo* is as migratory as the nominate race is in mainland Florida, where thousands may be seen migrating during the autumn near Apalachicola. This butterfly is figured by Riley (1975: pl. 21, fig. 14). If a proper foodplant occurs in the Man-o-War Bay area, and one should, there is no reason why this insect could not establish at least a temporary colony on Great Inagua.

Record: Man-o-War Bay, nr. Calf Pond, x.1985.

Ephyriades brunnea brunnea (Herrich-Schäffer 1864)

This insect is figured by Riley (1975: pl. 23, fig. 1) and is discussed by Clench and Bjorndal (1980: 27). We can concur that its favorite nectar source is Wild Coffee (*Psychotria ligustrifolia* (Northrop) Millsp.) and can add only that it was not as abundant in October 1985 as on the previous trip. Nevertheless, one can usually encounter it near woods edges.

Records: 0-2 km. N of Matthew Town, v.1984. Horse Pond, ca. 1.5 km. NE of Matthew Town, v.1983. 5 km. S of Salt Works, v.1984. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Ephyriades zephodes (Hübner 1825)

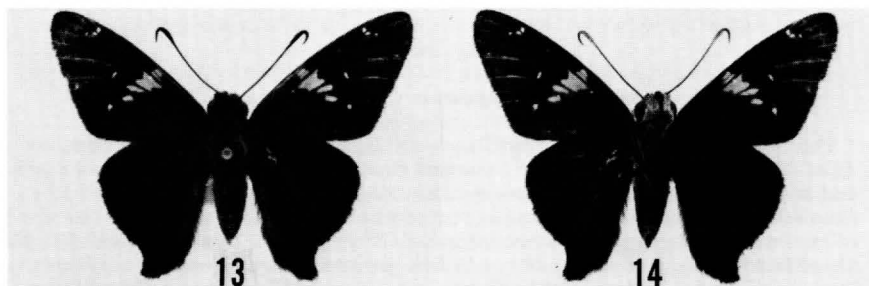
We did not see this insect, nor did Clench and Bjorndal (1980: 27), who recorded it on the basis of one old specimen. Riley (1975: text fig. 14) illustrates it. This species is surely not resident to the Inaguas.

Pyrgus oileus oileus (Linnaeus 1767)

Clench found an apparently thriving colony of this skipper near Matthew Town (Clench and Bjorndal 1980: 27), but it has not been seen there since. Certainly we did not collect it, although Miller thought he saw a specimen in 1984, but could not be certain. It is figured by Riley (1975: pl. 23, fig. 5).

Hylephila phyleus phyleus (Drury 1773)

This species, illustrated by Riley (1975: pl. 23, fig. 16) and discussed by Clench and Bjorndal (1980: 27-28), was decidedly uncommon in both 1984 and 1985. On each trip we



Figures 13-14: *Epargyreus zestos inaguarum* Clench and Bjorndal, ♂ upper (13) and under (14) surfaces; GREAT INAGUA ISLAND: Man-o-War Bay, x.1985 (Allyn Museum photo numbers 860320-2/3). Specimen magnified to approximately 1.11x.

collected only one specimen, and these were in widely separated places.

Records: Horse Pond, v.1984. Man-o-War Bay, nr. Calf Pond, x.1985.

Wallengrenia, new species near *vesuria* (Plötz, 1883)

A similar species is figured by Riley (1975: pl. 23, fig. 15), but not the one from Great Inagua Island which is discussed by Clench and Bjørndal (1980: 28). Most of our specimens were collected as they were nectaring on Wild Sage or *Zizyphus*. It was never encountered commonly and was decidedly more scarce in October 1985. The species will be named by J. Y. Miller in the near future.

Records: 0-2 km. N. of Matthew Town, v.1984. Horse Pond, x.1985. 5 km. S of Salt Works, v.1984. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, v.1984, x.1985.

Panoquina panoquinoides panoquinoides (Skinner, 1891)

The species is basically a denizen of hypersaline environments (Clench and Bjørndal (1980: 28), but it is found occasionally some distance from these *salinas*. We found a few specimens at blooms of *Phyla* around Horse Pond, about 0.5 km. from the nearest salt pan. It is illustrated by Riley (1975: pl. 24, fig. 15). *P. panoquinoides* was less common than we had been led to believe from Clench and Bjørndal's narrative. It was not quite so uncommon during October 1985 as in May 1984, when we saw but one specimen.

Records: Horse Pond, ca. 1.5 km. NE of Matthew Town, x.1985. Calf Pond, v.1984. Man-o-War Bay, nr. Calf Pond, x.1985.

A FURTHER NOTE ON *HERACLIDES ARISTODEMUS* IN THE BAHAMAS

In the same paper that he described *H. aristodemus bjørndalae*, Clench (1979) also described *Papilio aristodemus driophilus* from Andros Island, citing five major points of difference between it and the Floridian subspecies, *ponceanus* (Schaus). Clench had at the time five specimens of *driophilus* from which he made these comparisons. Later collecting, especially by Donald J. Harvey, has produced about two dozen specimens which we have examined in comparison with additional specimens of *ponceanus*. All of the characters cited by Clench are variable, and it is impossible to determine which should be called *driophilus* and which *ponceanus* without the locality labels. Reluctantly, therefore, we have concluded that *driophilus* is a junior synonym of *ponceanus* [new synonymy].

The identity of Florida and Andros material is not surprising: it is highly likely that the two areas exchange faunal elements rather regularly. This is the best explanation, for example, for the sporadic appearance of *Heraclides andraemon bonhoti* in Florida (it is abundant on Andros); and recently large populations of *Eumaeus atala* (Poeey), indistinguishable from Florida material, have been found in some habitats on Andros. It is intriguing that populations of *Battus devilliers* (Godart) also have been discovered recently on Andros; could rare immigration of Androsian *devilliers* to the mainland account for the old records of this species (perhaps they were not deliberately mislabelled, as previously claimed) in Florida? Possible answers are interesting to contemplate.

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Dr. David Hall of the Herbarium, Florida State Museum, Gainesville, Florida, confirmed plant identifications and was generally very helpful to entomologists with limited experience with plant taxonomy. Dr. Jacqueline Y. Miller did the photography for this paper.

The Staff at the Main House, especially Edna Walkine, was most helpful and made us feel comfortably at home during our stay. Mrs. Doris Mc Phee cheerfully provided the use of her truck during both of our stays on Great Inagua.

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To all of these people, and any who may have inadvertently been left out of the list, we owe a great debt of gratitude for making our Inagua experience a positive one.

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The works here cited should be consulted, along with the references cited therein, for a more comprehensive picture of the West Indian butterflies and, in the case of Clench and Bjorndal (1980), for additional information especially about the Inaguas.

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