PROCEEDINGS OF THE UNITED STATES NATIONAL MUSEUM

issued by the

SMITHSONIAN INSTITUTION
U. S. NATIONAL MUSEUM

Vol. 90 Washington: 1941 No. 3118

NOTES ON SOME NORTH AND MIDDLE AMERICAN DANAID BUTTERFLIES

By Austin H. Clark

Among the most interesting problems connected with the study of the Lepidoptera are those having to do more or less directly with the migrations of many species, and of all the migratory species the one that has attracted the most attention is our common milkweed butterfly, or monarch (*Danaus plexippus*).

This butterfly ranges from far north in Canada southward throughout North and South America to Patagonia. It occurs in a number of different forms, of which only the most northern (*plexippus*) and the most southern (*erippus*) are known to be migratory, the several tropical forms being apparently sedentary and in some cases of very restricted range.

All the forms of this butterfly are much alike. But if we are to obtain a clear picture of the migrations of our common North American form (*plexippus*) and its distribution, regular or casual, in Central America and in the West Indies we must distinguish it from the local and apparently sedentary forms, the ranges of which it frequently overlaps and with some of which it intergrades.

Dr. William Schaus and John F. G. Clarke have been so kind as to permit me to study the excellent series of specimens of this species in the collection of the National Museum, including the Barnes collection. In addition to these I have studied several hundred individuals mainly from New England and from the vicinity of Washington, D. C., in my own collection; about 70 specimens from the vicinity of New Orleans, La., generously sent me by Percy Viosca, Jr.; a fine specimen

of the subspecies *megalippe* from Key West, Fla., which I owe to the courtesy of Lucien Harris, Jr., of Atlanta, Ga.; a number of specimens from eastern Virginia in the collection of the University of Richmond captured by Dr. Carroll M. Williams; and about 50 from Tahiti, which were sent me by J. Morgan Clements. Dr. Hugo Kahl, of the Carnegie Museum at Pittsburgh, Pa., and Ralph Chermock were so good as to look up for me the specimen figured by Dr. W. J. Holland in "The Butterfly Book" as *plexippus* which I had long recognized as representing the South and Central American form *megalippe*.

My interest in the milkweed butterfly was first aroused a few years ago by the capture of two very worn examples of *Danaus plexippus megalippe* in eastern Virginia. These, at the time, were regarded merely as aberrations of the common *D. p. plexippus*. Later Mr. Harris sent me a fine specimen from Key West, Fla., and Mr. Viosca sent me four others that had been taken with numerous very worn migrants of *D. p. plexippus* near New Orleans, La. I then found that *megalippe* occurs sparingly in the coastal marshes of eastern Virginia in company with the much more numerous *plexippus*.

Whether this southern form is endemic on our southeastern coast or whether it is simply a casual, swept up, so to speak, in the wave of north-bound *plexippus* in spring, remains to be determined.

Unfortunately the material available has been far too limited to permit the drawing of any but tentative conclusions regarding the number and distribution of the forms of *Danaus plexippus* occurring in northern South America and in the West Indies. No specimens are at hand from Venezuela, except from Aroa in the west, or from most of the West Indian islands. The few West Indian specimens certainly do not give, in some cases, a true picture of the status of the species in those islands that are represented. For instance, only the northern *D. p. plexippus* is represented from Cuba and from Trinidad where the prevailing local form would presumably be *D. p. megalippe* or some variant of it.

It is hoped that this paper will serve to call attention to the interest attaching to the careful working out, on the basis of adequate material, of the tropical forms of this polymorphic species.

The National Museum has recently received from C. O. Neumann, of San Antonio, Tex., a fine specimen of *Danaus cleothera*, a species not heretofore recorded from the United States, and there is another specimen of the same species, also from Texas, in the Barnes collection. This collection includes, in addition, a specimen of *Danaus jamaicensis* from Florida. J. F. G. Clarke has suggested that notices of these specimens be included in the present paper.

With these additions the number of forms in the genus *Danaus* recorded from the United States reaches a total of seven—*Danaus*

plexippus plexippus, *D. p. megalippe*, *D. berenice berenice*, *D. b. strigosa*, *D. eresimus*, *D. cleothera*, and *D. jamaicensis*. In order to facilitate the identification of these forms in localities where information on the tropical American danaids is not easily accessible, it has seemed advisable to include a key to them.

At the suggestion of Mr. Clarke the description of an interesting new species from Peru allied to *D. nivosus* is appended.

KEY TO THE NORTH AND MIDDLE AMERICAN SUBSPECIES OF DANAUS PLEXIPPUS

a^1. Larger, fore wing more than 45 mm. long; fore wing with two light spots beyond end of cell; black border of hind wing with more or fewer small white spots.

b^1. Two spots beyond end of cell on fore wing and two larger spots between these and apex light dull orange contrasting with small white spots on costal border; apical portion of fore wing with more or less dull orange; two rows of small white spots in black border of hind wing.
plexippus (pl. 71, fig. 1)

b^2. Two spots beyond end of cell on fore wing and two larger spots between these and apex white; apical portion of fore wing with little or no dull orange; small white spots in black border of hind wing obsolete or lacking except at the outer and anal angles.

c^1. Ground color of wings dull orange———— megalippe (pl. 71, fig. 2)

c^2. Ground color of wings pale lavender-brown——— tobagi (pl. 71, fig. 3)

a^2. Smaller, fore wing less than 45 mm. long; fore wing lacking the two light spots beyond end of cell; no small white spots in black border of hind wing.
portoricensis (pl. 72, figs. 3, 4)

DANAUS PLEXIPPUS PLEXIPPUS Linnaeus

PLATE 71, FIGURE 1

Range.—Trinidad, British West Indies; Cuba; Peru; from Costa Rica (San José and Juan Vinas), the Gulf coast, and southern Florida northward throughout North America to Vancouver Island, the Northwest Territories, the Red River Valley, Fort Providence (west of Great Slave Lake), Lake Athabasca, the western shore of Hudson Bay, Moose Factory (on southwestern James Bay), southern Quebec, and Nova Scotia; Bermuda; the Canary and Cape Verde Islands; casual in the British Isles and western Europe; also, as a relatively recent immigrant, from the Hawaiian Islands and eastern Polynesia westward to the Andaman Islands, southward to northern New Zealand and eastern and southern Australia, and northward to Formosa.

Specimens from tropical America examined.—MEXICO: Coatepec, 1 ♀ (William Schaus); San Juan, Veracruz, 1 ♀ (W. Schaus). COSTA RICA: San José, 1 ♂; Juan Vinas, 2,500–3,500 feet, October 1906, 1 ♂ (W. Schaus and John Barnes). PERU: No further data,

1 ♂. TRINIDAD, British West Indies. MONTSERRAT, 1 ♂ (W. Schaus). CUBA: No. further data, 1 ♂ (W. Schaus).

Notes.—This insect is extraordinarily constant throughout its enormous range, and aberrations are rare. Most of the numerous specimens from Polynesia that I have examined, all more or less worn, are unusually dull in color, but this appears to be due simply to fading in intense sunlight. Old individuals from the eastern United States and from the Gulf coast are often equally dull.

In the Old World Tropics this northern subspecies shows no tendency to assume the characters of its tropical representative (*megalippe*) in America.

Regarding *Danaus plexippus* as it appears in Central America Godman and Salvin wrote:

> Central-American specimens, as a rule, agree closely with North-American ones in having the spots toward the apex of the anterior wings tawny instead of pure white. In Nicaragua, however, and further to the southward specimens approach more nearly to the race prevalent in the north-western portions of the southern continent [*megalippe*], and have these spots white and the veins of both wings more strongly margined with black. These characters are very slight, and show a tendency to a certain type rather than a present existing definable feature; and therefore we are unwilling to separate them. Still the divergence seems to commence in Nicaragua, all specimens found to the northward belonging to the northern form [*plexippus*], whilst those to the southward generally, but not universally, belong to the southern [*megalippe*].

Dr. Marston Bates wrote that "Cuban specimens of this species * * * fall within the range of variation shown by the North American population. Specimens from other West Indian islands and from the tropical mainland have been separated as distinct chromorphs." He also said that "The apex of the forewing above is almost entirely black in some specimens, and includes several white spots; the black border of the outer margin of both wings also includes two rows of white spots, sometimes only partly developed."

From this it would appear that both *plexippus* and *megalippe*, with intergrades, occur in Cuba as well as in parts of Mexico, southern Central America, and along the southern and southeastern coasts of the United States.

Migration notes.—Our knowledge of the migrations of this butterfly is as yet very imperfect. We need many more detailed records than are available at present, especially in the southeastern portion of the country, and we need far more information regarding the assumed northward migration in the spring.

The occurrence of a definite northward migration has always seemed to me debatable. It appeared to me more likely that a few individuals succeeded in overwintering in the north and that the northern population was maintained year after year by these rather

than by the annual mass incursion of immigrants from the south. While it is possible that a few individuals may succeed in overwintering in the north, as occasionally happens in the case of *Phoebis eubule*, it seems most probable that most of the northern population each season is derived from individuals of southern origin, as is usually assumed.

Dr. Frank Morton Jones, of Wilmington, Del., and Miss Dorothy K. Cleaveland, of California, Pa., have both been so kind as to send me records of unusual interest in connection with the northward migration.

Dr. Jones writes that at Virginia Beach, Va., from April 18 to 30, 1906, throughout most days, one to three or four of these butterflies were usually in sight, flying north or northwest, some obviously seeking the larval food plant. There were many dead ones along the shore, washed up by the waves.

This note is particularly interesting and significant in view of the fact that later in the season, in summer and autumn, this is not a common insect about Virginia Beach. It also suggests an explanation for the occurrence of the form with white preapical spots on the fore wings (*megalippe*) in southeastern Virginia. Individuals of this form, which so far as known is normally nonmigratory, may join the flocks of *plexippus* in the far south where both occur.

Miss Cleaveland thus describes a flight presumably of this species seen at Tahlequah, Oklahoma, on March 9, 1928:

> Tonight about 5:30 I saw a flock of hundreds of butterflies (?monarchs) flying low over my head, due north, characteristic butterfly flutter-flying and near enough to see the lack of bodies like birds, but too far to see markings. I was on upper Delaware Street, just starting to supper from the Rosses'.
>
> This is the note, made at the time, in my bird (and other nature subjects) journal. From all appearances I felt confident at the time, and have ever since, that I saw a northward spring migratory flight of monarch butterflies. It was much smaller than fall flights I have seen, but otherwise similar. The creatures were too close to me and I am too familiar in observing nature to be mistaken in their identity as butterflies. I judged they were monarchs because of their relative size and because I have seen the monarch southward flights and know something of their habits.

Dr. Carroll M. Williams writes that in the fall of 1936 he noticed a southerly movement of this species at Richmond, Va. "The steady, yet completely scattered migration in a general southern direction was quite apparent. No hint of mass migration was visible, however."

Dr. Williams quotes from a letter from Mrs. Walton, of Clifton Forge, Va., describing a mass migration in that locality. Mrs. Walton wrote:

> During the first of October 1935 a great mass of monarch butterflies passed through the valley coming from the northeast and following the valley river [the James] and railroad. They were about 30 yards in width and 6 feet in

depth. They were flying just high enough to miss the housetops and so on down until you could even touch them. They were flying at a moderate speed and some of them would pause a second to rest; and when night came they would all rest just where darkness caught them. They were so thick in places that they seemed like a cloud passing. Some of them would dart in and out between the houses. In their flight they followed the mountain valley.

This unusual flight was the subject of much discussion locally at the time.

Driving from Washington to Alexandria, Va., along the main boulevard on September 22, 1934, I saw between 200 and 300 of these butterflies in the adjacent fields or crossing the road, flying singly or more rarely in twos or threes, occasionally in larger groups, 6 to 15 or 20 feet above ground. All were flying directly west. The light wind, as determined from weather vanes in Alexandria, was east or slightly north of east. Continuing from Alexandria to Accotink, I noticed the same phenomenon; between 200 and 300 butterflies were seen, all flying west. On September 25, 1934, between 5 and 5:30 in the afternoon on the road from Accotink to Alexandria a few butterflies were noticed, flying west as before.

Dr. Remington Kellogg has given me a note on a migratory flight that he witnessed at Fishers Island, N. Y. Under date of September 19, 1921, he wrote that for the past two days large numbers, and at times a steady procession, of large dragonflies were observed flying across the island toward the southwest. Monarch butterflies (*Danaus plexippus*) were frequently seen, though never in such large numbers as the dragonflies. He noted that winds—that is, the prevailing northwest wind—apparently have little to do with the migration of the dragonflies and added that it is easy now to understand how it is that dragonflies form such a large item in the stomach contents of the pigeon hawks, which were migrating along the same route.

DANAUS PLEXIPPUS MEGALIPPE (Hübner)

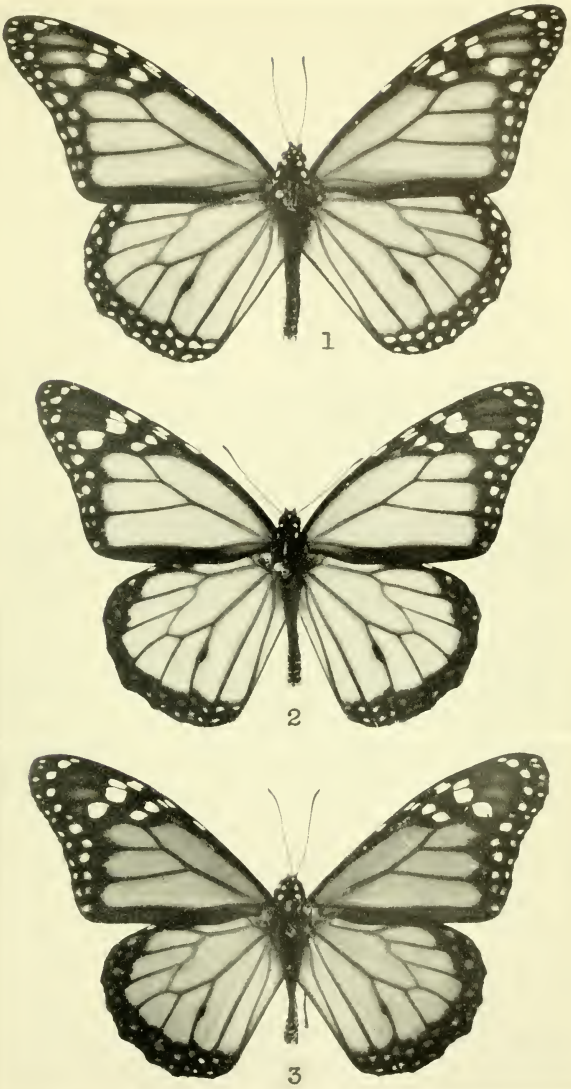
PLATE 71, FIGURE 2

Euploea Megalippe HÜBNER, Index systematicus, No. 220, 1826.

Anosia Megalippe HÜBNER, Sammlung exotischer Schmetterlinge, vol. 2, pl. 220 (7), figs. 1, 2, 1826.

Danais archippus form *nigrippus* HAENSCH, *in* Seitz, Die Gross-Schmetterlinge der Erde, vol. 5, p. 113, May 13, 1909.

Range.—From Peru (Chanchamayo) northward to Mexico (Colima) and eastward in northern South America to Venezuela (Aroa) and British and French Guiana; islands of St. Lucia and Dominica, Lesser Antilles; Puerto Rico; Dominican Republic (Samaná); coast of Texas; near New Orleans, La.; Key West, Fla.; about Currituck Sound, N. C.; coast of Virginia south of Chesapeake Bay; casual in Long Island, N. Y., and Decatur, Ill.



1. *Danaus plexippus plexippus*, male, Kendall, N. Y.; H. S. Burnett.
2. *Danaus plexippus megalippe*, male, British Guiana.
3. *Danaus plexippus tobagi*, new subspecies, male, Tobago, August 12, 1913; N. A. Wood; type specimen (U. S. N. M. No. 53526).

1, 2. *Danaus candidus*, new species, male, near Cuzco, Peru; H. A. Jaynes; upper (1) and under (2) sides; type specimen (U. S. N. M. No. 53528).
3, 4. *Danaus plexippus portoricensis*, new subspecies, male, Ciales, Puerto Rico, December 5, 1933; C. G. Anderson and A. S. Mills; upper (3) and under (4) sides; type specimen (U. S. N. M. No. 53527).

1, 2. *Danaus jamaicensis*, male, Florida: Roland Thaxter; upper (1) and under (2) sides
3. *Danaus berenice berenice*, male, Miami, Fla.; under side.
4. *Danaus berenice strigosa*, male, Brownsville, Tex.: George Dorner: under side.

1, 2. *Danaus eresimus*, female, Paso Prieto, Santiago, Cuba, October 27, 1934; upper (1) and under (2) sides.
3, 4. *Danaus cleothera*, male, Castroville, Tex., October 30, 1938; C. O. Neumann; upper (3) and under (4) sides.

Specimens examined.—Mexico: Esperanza, Colima, August 2, 1916, 1 ♂ (Leopold Conradt). El Salvador: San Salvador, October 1920, 1 ♂. Costa Rica: Juan Vinas, 2,500–3,500 feet, 2 ♀ ♀ (Schaus and Barnes). Panamá: Chiriquicito, July, 2 ♂ ♂ (Schaus and Barnes). Colombia: No further data, 1 ♂. Ecuador: Sarayaco, 3 ♀ ♀ (W. Schaus); Macas, 3,500 feet, July 1 ♂ (Mrs. James B. Rorer); Baños, 1 ♂; no further data, 2 ♀ ♀ (Prof. F. Campos R.). Peru: Chanchamayo, 1 ♂. Venezuela: Aroa, 1 ♀ (W. Schaus). British Guiana: Rockstone, Essequibo, 1 ♂ (Schaus and Barnes); no further data, 3 ♂ ♂, 1 ♀. French Guiana: St. Jean, Maroni, 1 ♂ (W. Schaus). St. Lucia: No further data, 1 ♂ (W. Schaus). Dominica: No further data, 1 ♂ (Prof. Harry Ward Foote, Yale explorations June–July 1913); July 29, 1903 1 ♀ (August Busck). Puerto Rico: Mayagüez, January 1899, 1 ♀ (August Busck). Dominican Republic: Samaná, 1 ♀. South America: No further data, 2 ♂ ♂, 1 ♀. No locality: 2 ♀ ♀. Louisiana: Rigolets Pass, St. Tammany Parish, 3 ♂ ♂, 1 ♀ (Percy Viosca, Jr.). Florida: Key West, December 18, 1936, 1 ♀ (Lucien Harris, Jr.). North Carolina: Northern end of Currituck Sound, July 4, 1938. Virginia: Back Bay, Princess Anne County, July 4, 1938; 2 miles west of Spring Grove, Surry County, June 15, 1938. New York: Long Island, September. 1 ♀. Illinois, Decatur, July 24–30, 1 ♀.

Notes.—Long ago W. F. Kirby correctly identified Hübner's figures of *Anosia megalippe* as representing the southern form of the common North American *plexippus*. He recorded the fact that whereas Hübner showed the apical spots on the fore wings as white, in *plexippus* "most of the apical spots on the fore wings are not white, but tawny." He gave the habitat of *megalippe* as the Antilles, Venezuela, Bogotá, and Ecuador. But his determination seems generally to have been overlooked, and in 1909 Dr. R. Haensch renamed this form *nigrippus*.

This is the subspecies represented by Dr. W. J. Holland in "The Butterfly Book," plate 7, figure 1. The figured specimen in the Carnegie Museum, as I have been kindly informed by Dr. Hugo Kahl and Ralph Chermock, bears the label "*Danais erippus*, South America" and was obtained from Dr. Staudinger. It agrees well with others at hand from the Guianas.

The specimens from western South America, including Venezuela, and Central America, are somewhat darker and more reddish than those from the Guianas, the West Indies, and the eastern United States, but the difference is very slight and inconsistent.

Godman and Salvin noted that three examples from St. Vincent (both windward and leeward sides) had white subapical spots, agreeing with South American specimens. They had many specimens from Dominica, all belonging "to the form prevalent in the northern parts

of South America, in which the spots in the apical portion of the primaries are purer white than in North American examples." W. J. Kaye wrote that in Jamaican and Haitian specimens the usual white spots in the apex of the fore wing are oftener than not yellowish.

As examples of intermediates between this form and typical *plexippus* the following specimens may be mentioned: A rather dark female from Jalapa, Mexico, collected by Dr. William Schaus, has the preapical spots on the fore wings pale yellowish, though the apical area is very dark; there are two complete rows of small spots in the black border of the hind wings. In a female from San José, Costa Rica, the upper preapical spots on the fore wing are white, the lower ones yellowish; the apical area is black; the spots in the border of the hind wing are obsolete, except at the anal angle. One of the specimens from Juan Vinas, Costa Rica, has both rows of white spots developed in the black border of the hind wings.

The specimen from Mayagüez, Puerto Rico, lacks the two white spots beyond the end of the cell in the fore wing; the fore wing is 52 mm. long. One of the females from "South America" is very dark.

The boundary between plexippus *and* megalippe.—In Nicaragua (Godman and Salvin), Jamaica (Kaye), Haiti (Kaye), and Cuba (Bates) and along the southern and southeastern coast of the United States *Danaus plexippus* appears to be represented by a population including individuals typical of both *plexippus* and *megalippe*, with a complete series of intergrades. In some of these areas, as in southern Central America, the *megalippe* form appears to predominate; in others, as in Cuba and the southern and southeastern United States, the *plexippus* form. The exact relation between the two forms in this intermediate region remains to be worked out.

DANAUS PLEXIPPUS TOBAGI, new subspecies

PLATE 71, FIGURE 3

Diagnosis.—Similar in all respects to *D. p. megalippe* but with the ground color of the wings pale lavender-brown.

Range.—Confined to the island of Tobago, British West Indies.

Type—Scarborough, Tobago, collected by N. A. Wood on August 12, 1913, ♂ (U.S.N.M. No. 53526).

Additional specimens examined.—TOBAGO: Scarborough, August 5, ♂, August 8, ♀; Botanic Station, August 1, ♂, July 24, ♀; The Bay, August 2, ♀; all collected by N. A. Wood in 1913.

Remarks.—This form is strikingly different from *D. p. megalippe* in the ground color of the wings, though it resembles it in all other features. In a rather rare aberration of *D. p. plexippus* (*fumosus*) the wings have the same ground color.

DANAUS PLEXIPPUS, ?subspecies

Speaking of *Danaus plexippus* as it occurs on the island of Trinidad, British West Indies, William James Kaye said "The specimens from Trinidad are very richly dark coloured and have the marginal band to the hind wing very dark and very little spotted." From this it would appear that Trinidad is inhabited by a local race allied to that on the neighboring island of Tobago. Mr. Kaye's description certainly does not apply to specimens from the mainland in Guiana, which are unusually bright.

The only specimen at hand from Trinidad represents *D. p. plexippus* and not the form mentioned by Mr. Kaye.

DANAUS PLEXIPPUS PORTORICENSIS, new subspecies

PLATE 72, FIGURES 3, 4

Diagnosis.—Resembling *D. p. megalippe* from the Guianas but smaller, the fore wing less than 45 mm. long; pair of white spots just beyond the end of the cell in the fore wing absent; two preapical spots small and pale yellowish; no white spots in the black border of the hind wing.

Range.—Known only from the island of Puerto Rico.

Type.—Ciales, north-central Puerto Rico, collected by C. G. Anderson and A. S. Mills, of the United States Bureau of Entomology and Plant Quarantine, December 5, 1933, ♂ (U.S.N.M. No. 53527).

Additional specimen examined.—No data, ♂; received from the Brooklyn Museum.

Remarks.—The small size, absence of the two light spots beyond the end of the cell, and absence of white spots in the border of the hind wing give this form a very distinctive appearance. It is, of course, possible that it may prove to be merely an abnormally marked dwarf of *D. p. megalippe*, but the fact that the two specimens at hand are quite alike would seem to indicate that it is a valid race.

A specimen of *D. p. megalippe* from Puerto Rico also lacks the two white spots beyond the end of the cell of the fore wing, and these are occasionally absent from specimens of *D. p. plexippus* taken in the southeastern United States.

DANAUS CLEOTHERA Godart

PLATE 74, FIGURES 3, 4

Localities.—TEXAS: Medina River near Castroville, Medina County, collected by C. O. Neumann on October 30, 1938, ♂; Brownsville, Cameron County, collected by Armstrong on November 17, 1933, ♂.

Notes.—The specimen from near Castroville is a rather small male with the fore wing 39 mm. long. It is rather dark and unusually well

and clearly marked on the under side of the hind wings. It resembles most closely specimens from Guatemala and from San Mateo, Costa Rica, in the National Museum collection.

The specimen from Brownsville is a slightly larger male with the fore wing 42 mm. long. It is not so contrastingly marked on the under side of the hind wings as is the specimen from near Castroville. It agrees very closely with a specimen from Honduras in the National Museum collection.

Danaus cleothera is easily distinguished from *D. eresimus*, which, according to Dr. Marston Bates, occurs in southern Florida, by the absence of the two large white spots between veins 2 and 3 and 3 and 4 on the fore wings above and by the conspicuous white borders of the veins on the hind wings beneath.

DANAUS JAMAICENSIS Bates

PLATE 73, FIGURES 1, 2

Locality.—Florida, collected by Prof. Roland Thaxter.

Notes.—The Barnes collection, now in the United States National Museum, contains a typical example of this species from Florida. The label has printed upon it the word "*Florida*," below which is written in a German hand the name "Thaxter." Presumably the specimen was collected in Florida by Dr. Roland Thaxter, professor of cryptogamic botany at Harvard University, who in his early years was an enthusiastic entomologist, and the name "Thaxter" written on the label by Dr. Herman August Hagen, who until his death in 1893 had charge of the insects in the Museum of Comparative Zoology. The label has been compared with a specimen of Dr. Hagen's handwriting, and there appears to be little doubt that the name "Thaxter" was written on the label by him.

Remarks.—Certain small pale specimens of *Danaus berenice strigosa* from Mexico approach *D. jamaicensis* so very closely as to suggest that *jamaicensis* should be considered as a subspecies of *berenice* rather than as a distinct species.

KEY TO THE DANAIDS RECORDED FROM THE UNITED STATES

a^1. Ground color of wings dull orange, veins black_____ plexippus

b^1. Preapical spots on fore wings light dull orange; apical portion of fore wing with more or less dull orange; two rows of small white spots in the black border of hind wing_____ plexippus plexippus (pl. 71, fig. 1)

b^2. Preapical spots on fore wings white or whitish; apical portion of fore wing almost wholly, or quite, black; spots in black border of the hind wing obsolete or wholly absent in central portion.

plexippus megalippe (pl. 71, fig. 2)

a^2. Wings except for black border uniform brown, dark or light.

b^1. Underside of hind wing with ground color uniform, veins black with white edgings.

c^1. Larger, fore wing more than 40 mm. long; color dark chocolate-brown. berenice

d^1. Veins on hind wing above concolorous with ground color. berenice berenice (pl. 73, fig. 3)

d^2. Veins on hind wing above edged with light gray. berenice strigosa (pl. 73, fig. 4)

c^2. Smaller, fore wing less than 40 mm. long; color light yellowish brown. jamaicensis (pl. 73, figs. 1, 2)

b^2. Underside of hind wing with ground color not uniform, having lighter and darker markings.

c^1. Fore wing above with two large submarginal white spots between veins 2 and 3 and 3 and 4; hind wing below with an arc of large, pale, inconspicuous, more or less confluent spots parallel with margin midway between cell and dark border, and with veins narrowly blackish. eresimus (pl. 74, figs. 1, 2)

c^2. Fore wing above without white spots between veins 2 and 3 and 3 and 4; hind wing below with a dark line from anterior border along end of cell and another parallel to and some distance from it, these two lines fusing at lower end of cell and running as a broad band to inner border of wing; veins in central portion of wing, except where crossing dark bands, broadly edged with white_____ cleothera (pl. 74, figs. 3, 4)

DANAUS CANDIDUS, new species

PLATE 72, FIGURES 1, 2

Description.—Upper surface: White, faintly clouded with pale buff, with a broad black border including two rows of rather large white spots, the veins on the hind wings very dark brown narrowly edged with gray, those on the fore wings edged with lighter brown; cell of fore wing brown with a broad light streak near the lower border; between veins 1 and 2, 2 and 3, and 3 and 4 are three large subcircular white spots occupying the entire width of the interspace, delimited interiorly by a faint clouding of the background; there is a similar spot, situated nearer the margin of the wing, between veins 4 and 5; above this last and in line with the three preceding spots are two somewhat smaller elongated spots; between these and the end of the cell are two approximately similar spots, and just within the end of the cell a triangular or broadly chevron-shaped spot; above the cell spot and each of the two pairs of spots beyond is a white dash on the costal border. *Lower surface*: Fore wing with the cell brown, and the interspaces between the veins brown as far as the submarginal spots, with a large broadly chevron-shaped white spot between the bases of veins 2 and 3, a small spot just above this, a long dash along the inner portion of vein 2 which is continued inward along the lower border

of the cell half way to the wing base, and a similar dash just above vein 1; hind wings faintly tinged with dull yellowish, the veins blackish brown.

The sexes are similar.

Type.—Near Cuzco, Peru, collected by H. A. Jaynes, of the U. S. Bureau of Entomology and Plant Quarantine, now stationed at Jeanerette, La., ♂ (U.S.N.M. No. 53528).

Additional specimen examined.—A female, from the same locality, also collected by Mr. Jaynes.

Remarks.—This species is allied to *D. nivosus*, of which it may eventually prove to be merely an extreme form. It is easily distinguished from *nivosus* by the almost pure white hind wings and the much whiter fore wings on which the submarginal white spots between vens 1 and 2, 2 and 3, and 3 and 4 are larger, the first two reaching the dark border; the spots in the dark border of the wings are also larger, and the inner row is complete, the spots in this row being as large as those in the outer row.

U. S. GOVERNMENT PRINTING OFFICE: 1941