

2025

212  
Smith

73

PROCEEDINGS

OF THE

CALIFORNIA ACADEMY OF SCIENCES

---

FOURTH SERIES

---

Vol. I

1907-1912

SAN FRANCISCO  
PUBLISHED BY THE ACADEMY  
1912

✓  
231493

## CONTENTS OF VOLUME I.

### PLATES I-XXXIV.

	PAGE
Title-page .....	i
Contents .....	iii
No. I. Preliminary Description of Four New Races of Gigantic Land Tortoises from the Galapagos Islands. By John Van Denburgh .....	1
(Published December 20, 1907)	
No. II. A Botanical Survey of the Galapagos Islands. By Alban Stewart. (Plates I-XIX) .....	7
(Published January 20, 1911)	
No. III. The Butterflies and Hawk-Moths of the Galapagos Islands. By Francis X. Williams. (Plates XX-XXI)..	289
(Published October 7, 1911)	
No. IV. The Snakes of the Galapagos Islands. By John Van Denburgh. (Plates XXII-XXX) .....	323
(Published January 17, 1912)	
No. V. Notes on the Botany of Cocos Island. By Alban Stewart. (Plates XXXI-XXXIV) .....	375
(Published January 19, 1912)	
No. VI. The Geckos of the Galapagos Archipelago. By John Van Denburgh .....	405
(Published April 16, 1912)	
No. VII. Notes on the Lichens of the Galapagos Islands. By Alban Stewart .....	431
(Published December 17, 1912)	
Index .....	447

December 30, 1914.

PROCEEDINGS  
OF THE  
CALIFORNIA ACADEMY OF SCIENCES  
FOURTH SERIES

Vol. I, pp. 1-6.

December 20, 1907.

---

Expedition of the California Academy of  
Sciences to the Galapagos Islands,  
1905-1906.

I.

Preliminary Descriptions of Four New Races of Gigantic  
Land Tortoises from the Galapagos Islands.

BY  
JOHN VAN DENBURGH,  
*Curator of the Department of Herpetology.*

SAN FRANCISCO  
PUBLISHED BY THE ACADEMY  
1907

PROCEEDINGS  
OF THE  
CALIFORNIA ACADEMY OF SCIENCES  
FOURTH SERIES

VOL. I, pp. 1-6.

December 20, 1907.

---

EXPEDITION OF THE CALIFORNIA ACADEMY OF  
SCIENCES TO THE GALAPAGOS  
ISLANDS, 1905-1906.

I.

PRELIMINARY DESCRIPTIONS OF FOUR NEW RACES  
OF GIGANTIC LAND TORTOISES FROM  
THE GALAPAGOS ISLANDS.

BY JOHN VAN DENBURGH,  
*Curator of the Department of Herpetology.*

Early in 1905 the California Academy of Sciences decided to send an expedition to the Galapagos Islands. The general purpose was to explore this group more thoroughly than the opportunities of previous investigators had permitted, and to secure large collections of the plants, mollusks, insects, birds, mammals, and reptiles in the hope of throwing more definite light upon the origin of the archipelago. Particularly, it was determined to study the geology of the islands, to make a very careful search for fossils, and to spare no effort to secure specimens or remains of those races of the gigantic land tortoises which long had been thought extinct.

Study of the published results of previous expeditions had convinced me not only that these islands must all, at some

December 19, 1907.

former period, have been parts of a single land-mass, becoming later, by partial submersion, separated into the various islands, but that Albemarle Island, which possesses several races of tortoises and on which Heller and Snodgrass found evidence of an elevation amounting to several hundred feet, had much more recently been formed by the union of several smaller islands corresponding, probably, to its five great volcanoes. Accordingly, the members of the expedition were instructed to collect on Albemarle exactly as though it still were five islands.

The expedition set sail from San Francisco, on the twenty-eighth of June, 1905, in the schooner "Academy," which had been purchased and rechristened for the purpose. The scientific staff of the expedition consisted of eight young men. Mr. R. H. Beck, who has had more experience in these islands than any other collector, this being his fourth expedition to them, was in charge. Mr. Alban Stewart went as botanist; Mr. W. H. Ochsner, as geologist; Mr. F. X. Williams, as entomologist; while Mr. E. W. Gifford and Mr. J. S. Hunter were to study and collect the birds, and my assistant Mr. J. R. Slevin, with the aid of Mr. E. S. King, was to care for the reptiles.

Having made brief stops at various islands near the coast of Lower California, as well as at San Benedicto, Socorro, Clipperton, and Cocos Islands, the party reached the Galapagos Archipelago and landed upon Hood Island, September 24, 1905. During the months which followed the most arduous collecting was vigorously carried on in all the islands of the group, many of the larger being visited several times, and on September 25, 1906, after a full year of work, the "Academy" left Culpepper Island and set sail for San Francisco, where she arrived in safety Thanksgiving Day, November 29, 1906.

The collections brought back are by far the largest and most important ever gathered in these islands. The reptiles number over forty-five hundred specimens, of which nearly four thousand are from the Galapagos. The search for land tor-

toises met with far greater success than I had dared anticipate. All of the races which had been supposed extinct were found still living, with the exception of that of Charles Island. Tortoises were also found living on two islands which they had not previously been known to inhabit. On Barrington Island, also not hitherto known to have supported tortoises, portions of the remains of fourteen individuals were secured. It is probable that the tortoise of this island, like that of Charles, is really extinct. A single tortoise was secured on Cowley Mountain, Albemarle Island, and others were found living in all of the other localities from which these huge reptiles have ever been recorded. In all over three hundred tortoises are represented in the collection, some forty of them, however, only by more or less fragmentary remains.

A complete report upon this collection can only be issued after an immense amount of work. Meanwhile, it seems best to publish this brief statement and the following preliminary descriptions of the tortoises of Hood, James, Chat-ham, and Narborough Islands, which seem never to have been described.

#### *Testudo hoodensis* new species.

*Type*.—Adult (?) female (?) now living in Golden Gate Park, San Francisco. California Academy of Sciences No. 8121. Hood Island, Galapagos Archipelago. Joseph R. Slevin and E. S. King. Caught June 27, 1906.

*Diagnosis*.—No nuchal; gulars paired; front of carapace high, little lower than middle, height at nuchal notch more than 41% (45%) of straight length; difference between percentages of heights at third vertebral and at nuchal notch less than 9 (5); carapace saddle-shaped, narrow anteriorly, width at margin of junction of second and third marginals not more than 54% (45%); first marginals not greatly enlarged, not much everted, their ventral surfaces not vertical, their most prominent points separated by less than 30% (20%); length over curve not more than 123% (122%), greater than width over curve; vertical distance from lower surface of plastron to lower edge of lateral marginals great, 12%; general size rather small, straight length (June, 1907) 22.2 inches; plastron long, median length 89%; plates striated, central portions of vertebrals and costals much elevated; pectoral plates forming a suture on median line; lower jaw and throat marked with yellow.

### *Testudo darwini* new species.

*Type*.—Adult male. California Academy of Sciences No. 8108. James Island, Galapagos Archipelago. R. H. Beck and Joseph R. Slevin. July 31, 1906.

*Diagnosis*.—No nuchal; gulars paired; fourth cervical vertebra biconvex;<sup>1</sup> carapace high, elongate, somewhat dome-shaped but high in front; posterior declivity beginning about middle of third vertebral; height at nuchal notch more than 41% (45%) of straight length; difference between percentages of height at third vertebral and at nuchal notch more than 9 (10); carapace not saddle-shaped, width at margin of junction of second and third marginals 55%; width over curve in male not greater than length over curve; vertical distance from lower surface of plastron to lower edge of lateral marginals moderately great (9%); general size large, straight length 38 inches; shell heavy; pectoral plates forming a suture on median line; the sum of the measurements of the length over curve, length of plastron, height at nuchal notch, and height at third vertebral, equals or exceeds the sum of the measurements of the straight length, straight width, and width over curve; jaws and throat black.

### *Testudo chathamensis* new species.

*Type*.—Skeleton of adult male. California Academy of Sciences No. 8127. Found in a cave on Chatham Island, Galapagos Archipelago. R. H. Beck and Joseph R. Slevin. February 12-14, 1906.

*Diagnosis*.—No nuchal; gulars paired; fourth cervical vertebra biconvex; carapace depressed, front elevated in male; height at nuchal notch less than 41% of straight length (male 34, female 27%); male flat-backed, female dome-shaped, difference between percentages of heights at third vertebral and at nuchal notch 6 in male, 24 in female; carapace of male slightly saddle-shaped but broad, width at margin of junction of second and third marginals 53% in male; anterior marginals but little everted; length over curve in male 112%, female 126%; vertical distance from lower surface of plastron to lower edge of lateral marginals small, 4% in male, 6% in female; general size moderate, straight length in male 35.25 inches, female 22.5 inches; pectoral plates much reduced, not meeting on mid-line; jaws and throat of female black.

### *Testudo phantasticus* new species.

*Type*.—Adult male. California Academy of Sciences No. 8101. Narborough Island, Galapagos Archipelago. R. H. Beck. April 5, 1906.

---

<sup>1</sup>It is probable that this is the normal arrangement in all the races of the Galapagos Islands. The third cervical vertebra has been found biconvex in the types of *T. galapagensis* and *T. becki*; but in seven specimens of the latter the fourth is biconvex, as in other races.

*Diagnosis.*—No nuchal; gulars paired; fourth cervical vertebra biconvex; front of carapace high, not lower than middle, height at nuchal notch more than 41% (54%) of straight length; difference between percentages of height at third vertebral and at nuchal notch less than 9 (2); carapace saddle-shaped, narrow anteriorly, width at margin of junction of second and third marginals not more than 54% (46%); first marginals much enlarged, everted more than in any other race, their ventral surfaces nearly vertical, their edges from nuchal notch to prominent point nearly horizontal, prominent point almost a right angle; distance between prominent points of first marginals more than 30% (32%); length over curve more than 123% (124%), greater than width over curve; vertical distance from lower surface of plastron to lower edge of lateral marginals small, 6%; general size moderate, straight length 34.5 inches; plastron short, 70%; pectoral plates forming a suture on median line; lower jaw and throat marked with yellow.

A few words in explanation of the measurements given in the foregoing descriptions may be necessary. In attempting to avoid the indefiniteness which has too largely characterized descriptions of these tortoises it was quickly found necessary to devise some means of expressing and comparing upon paper their individual variation in shape. This, it was found, could best be done by taking numerous measurements of each tortoise and reducing all these measurements to percentages of the (straight) length of the tortoise. In this way, the measurements of tortoises of all sizes may be directly compared. The tortoise is placed upon a level board or table in such a position that it rests naturally upon, as nearly as possible, the entire length of the plastral bridge of each side. With the tortoise in this position, the straight length is the distance between verticals erected at the nuchal notch and at the posterior border of the supracaudal plate. The straight width is the distance between verticals erected at the sides of the tortoise opposite the line of meeting of the second and third costal plates. The curved length is measured with a tape-measure over the midvertebral line from the nuchal notch to the posterior edge of the supracaudal plate. The curved width is taken from the bend in the marginal plates up along the line of meeting of the second and third costals, across the middle of the third vertebral, down between the second and third costals, to the line of bending of the marginals. The width



second to third marginals is the straight width at the level of the lateral margins of the sutures between the second and third marginal plates of each side. The middle height is the vertical distance between the board or table and the middle of the third vertebral plate, and is taken with a square and spirit-level. The front height is taken in the same manner at the nuchal notch. The height to marginals is the vertical distance from the table to the lower border of the marginal plates at about the middle of the plastral bridge. The plastron is measured with a tape along the median line, the tape is not pushed into plastral depressions and when the plastron is notched the projections are not measured.

SAN FRANCISCO,  
November 18, 1907.