

unscratched. The Prieska conglomerate passes under the so-called Kimberley shales or under the lowest sheets of dolerite at the bottom of the shales. No evidence was found to support the idea of Greene that the Kimberley shales rest upon the denuded surfaces of Dwyka and Ecca beds.

4. *The Founders of Geology*; by Sir ARCHIBALD GEIKIE. Pp. 297. Baltimore, 1901 (Johns Hopkins Press).—The highly interesting, and permanently valuable, course of lectures delivered by Sir Archibald Geikie at Baltimore in 1897 have recently been published in attractive form. As is well known, these lectures formed the first of the series of the George Huntington Williams Memorial Lectures on the Principles of Geology, established through the generosity of Mrs. Williams, under the auspices of the Geological Department of the Johns Hopkins University. A second series of lectures was delivered a year since, by Prof. W. C. Brögger (this Journal, June, 1900, p. 456).

5. *Das Gesetz der Wüstenbildung in Gegenwart und Vorzeit* von JOHANNES WALTHER. Pp. 175 with 50 illustrations. Berlin, 1900 (Dietrich Reimer).—Some years since, an interesting volume was published by the present author on Denudation in the Desert (this Journal, xlii, 177, 1891). He has now taken up the allied subject of the formation of desert regions both at present and in the past. He notes that the problem of the desert in general is involved in that of the history of regions having no drainage outlets; for although it is not true that every desert is without outlet, nor is every such region a desert, yet both phenomena are closely connected together. Of the entire land surface of the globe, estimated at 130,000,000 square kilometers, about one-fifth belongs to regions where the drainage is without outlet. Of these, 12,000,000 square kilometers belong to Asia, 7,000,000 to Australia, 4,000,000 to Africa, and 1.3 millions to America. If we go back in geological time, even as far as the Miocene, we find these areas largely increased; hence the importance of this aspect of the subject.

The special topics discussed by the author are the dry weathering due chiefly to change of temperature, deflation or the effect of winds, also the action of flowing waters. Other interesting chapters are those devoted to the deposition of gravel or mud, of lake loess and sand dunes; further the desert flora and fauna; the saline deposits, etc. The author has brought to the discussion of the subject a thorough knowledge of the various points, made more definite from his own personal observations; he has illustrated his text with excellent figures, and thus the volume as a whole is very suggestive from the scientific standpoint as well as being thoroughly readable.

### III. ZOOLOGY.

1. *Recent papers relating to the fauna of the Bermudas*, with some corrections.—In the Trans. Conn. Acad. Sci., Vol. X, Part 2, are nine papers on this subject, viz:

(1) The Air-breathing Mollusks of the Bermudas. By Henry A. Pilsbry. Plate 62.

(2) Additions to the Ichthyological Fauna of the Bermudas, from the collections of the Yale Expedition of 1898. By Samuel Garman.

(3) Additions to the Marine Mollusca of the Bermudas. By A. E. Verrill and Katharine J. Bush. Plates 63-65.

(4) The Nudibranchs and naked Tectibranchs of the Bermudas. By A. E. Verrill. Plate 66.

(5) Additions to the Anthozoa and Hydrozoa of the Bermudas. By A. E. Verrill. Plates 67-69.

(6) Additions to the Crustacea and Pycnogonida of the Bermudas. By A. E. Verrill. Plate 70.

(7) Additions to the Echinoderms of the Bermudas. By A. E. Verrill.

(8) Additions to the Tunicata and Molluscoidea of the Bermudas. By A. E. Verrill. Plate 70.

(9) Additions to the Turbellaria, Nemertina and Annelida of the Bermudas, with Revisions of some New England genera and species. By A. E. Verrill. Plate 70.

Besides the above, Dr. W. M. Rankin has recently published "The Crustacea of the Bermuda Islands" (Annals N. York Acad., xii, p. 521, 1900), and Prof. H. L. Clark has published two papers on the Bermuda Echinoderms (op. cit., xi, p. 407, 1898, and vol. xii, p. 117, 1899).

The nine papers first mentioned are preliminary to a much fuller report on the Fauna of the Bermudas, now nearly completed by the writer, which is to be freely illustrated. It is intended to supply a want long felt by numerous students of zoölogy who annually visit the Bermudas, Bahamas, and other West Indian Islands. The marine fauna of the Bermudas is largely a colony from the West Indies.

These preliminary papers give, however, a much fuller idea of the character and extent of the Bermudian fauna than any previous works, relating to the same groups.

Mr. Pilsbry's paper on the terrestrial mollusks is complete, up to date. It includes 41 species. Of the truly terrestrial forms all except 15 species are supposed to have been introduced in comparatively modern times, and several quite recently. Six species: *Helicina convexa*, *Thysanophora hypolepta*, and *Pæcilozonites* with four species, are endemic and not known elsewhere. The latter genus is the most remarkable, and its largest species (*P. Nelsoni*) is extinct, but it occurs abundantly in the æolian limestone, sometimes in strata exposed only at low tide, thus showing that it lived on the islands before their partial submergence, and indicating the comparatively great antiquity of the genus. Its nearest allies are now found in the eastern United States. The *Rumina decollata* is now the most abundant land shell. It was introduced accidentally, about 1876, probably on plants from Teneriffe or the Cape Verde Islands by Governor

Lefroy. It was first recorded by Bartram in 1879. A single specimen was found by J. M. Jones in the governor's grounds in 1877. It spread very gradually, at first, from Hamilton, as a center, until in a few years it became an important horticultural pest, for it has but few natural enemies in the islands. Mr. Garman describes three small rare fishes, dredged in shallow water. One of these is new (*Brosmophycis Verrillii*), another (*Gobius stigmaturus*) was previously known only from the original type, of which the origin was not known.

In the paper on Anthozoa, etc., several species of corals, gorgoniæ and actinians are for the first time recorded from Bermuda. The most important additions to the reef corals are *Orbicella cavernosa*, *O. annularis*, and *Plesiastrea Goodei*, (sp. nov.), all large, massive species. The animal of *Madracis decactis* is described and figured for the first time. It has 20 tentacles. The current erroneous descriptions of the polyps of *Siderastrea* are corrected. Other genera are revised. Five new species of Actinaria are described. Seven gorgonians are added to the fauna, including *Muricea muricata* and one very large new species (*Eunicea grandis*).

In Dr. Rankin's paper on the Crustacea, 57 species of Malacostraca are enumerated.\*

In the paper on Crustacea by the writer, 25 additional Malacostraca are recorded, not including a few that are synonymous with some in Dr. Rankin's list. Miss M. J. Rathbun has since sent me the names of a few additional species,† viz: *Scyllarides*

\* This is exclusive of "*Pandalus tenuicornus*" (p. 544) introduced by an error, and *Alpheus Edwardsii*. A specimen of the latter sent to me by Dr. Rankin is the young of his *A. hippothoë*, var. *bahamensis*, which he also sent to me. This is apparently a form of *A. heterochelis* Say.

† Miss Rathbun has also determined some of those that were left doubtful in my list. The shrimp mentioned under Pontonidæ (p. 579) is *Gnathophyllum Americanum* (Guerin). The "*Paguristes?*" (p. 578) is a new species of hermit crab, viz: *Clibanarius Verrillii* Rathbun, sp. nov.

"The chelipeds are similar in shape but noticeably unequal, the propodus of the right being  $\frac{5}{6}$  the length of the left. The distal margin of the carpus of both chelipeds is in line with the end of the eyes. The merus of the larger cheliped is two-thirds as high as long; its outer surface is marked by a few short, faint rugose lines; the upper margin is similarly rugose. The carpus is furnished with rough granules above and along the distal margin; there is a large tubercle on the outer surface. The palm is subrectangular, about equally long and high; upper margin convex. The margins are rough with granules; the outer surface is nearly smooth. Both fingers are stout and deflexed, and gape widely; the inner margins are very unevenly toothed; the upper margin of the dactylus is bordered by two rows of sharp granules. The fingers are excavated at the tips, which are white.

The smaller cheliped differs not only in being shorter and narrower but in having the upper margin of the carpus and propodus cut into stout spines increasing in size distally. A similar large spine is on the upper margin of the dactylus at the proximal third. The right cheliped is more hairy than the left, with long light hairs.

*Colors.*—In formalin a pinkish-white or yellowish-white ground-color with small roundish spots of bright yellowish-red or orange which are most numerous along the upper and distal margins of the segments of the legs, where they tend

*latus* and *S. sculptus* (U. S. Nat. Mus., coll. Dr. T. H. Bean); *Hippolyte acuminatus* (coll. Goode); and *Domecia hispida* (coll. Yale Exp., 1898). To these should be added *Hippolyte bidentata* Bate, making the total number of species 87, now known.\*

Two new species of Pycnogonida, the only ones known in the region, are described and figured.

In the paper on the marine Mollusca a large number of species (about 80) are added to the fauna, and most of them are figured. Of these 25 species are described as new. This makes the total number about 350. In the article on Nudibranchs, etc., nine new species are described, including a very large *Aplysia* and a new genus (*Pleurobranchopsis*), allied to *Pleurobranchus*, but without a shell. In the three papers on echinoderms about 40 species are recorded, including numerous additions to the fauna, but no new species, except *Synapta acanthia*, described by Prof. Clark (1899, p. 134). Of Tunicata four new species are described, including a large and elegantly colored *Diazona* (*D. picta*), and three others are added to the fauna. The compound ascidians, which are numerous, have not been worked up. A small reddish brachiopod (*Cistella cistellula*) was found attached to the under side of corals in Harrington Sound. It agrees closely with specimens from Naples. Several Bryozoa are recorded for the first time, and two remarkable new species are described.† One of these (*Caulibugula armata*) is the type of a new genus, allied to *Bugula*, but it has an articulated stem; the other (*Barentsia timida*) is allied to *Pedicellina*.

In the ninth paper, two new planarians and two new nemerteans are described, and a previously known species of each group is recorded, both of which are found at Naples. These orders are sparsely represented at Bermuda and none had been recorded previously except the terrestrial *Tetrastemma agricola*. Of *Gephyræa* 4 species are recorded, two of which (*Aspidosiphon spinulosum* and *Golfingia elongata*) are new. Of Annelida 60 new species are described and at least 10 others are added to the fauna, which about trebles the known species. About 25 of the new species are Syllidæ. Several new genera are described and

to form irregular transverse bands. There are four bands on each of the propodal and terminal joints of the second and third pairs of legs; chelæ and eye-stalks spotted with red." (M. J. Rathbun.)

Total length about 40<sup>mm</sup>. It becomes much larger.

Bermudas, 4 large and 1 small specimen (coll. Dr. F. V. Hamlin); Yale Mus. and U. S. Nat. Mus.

\* The marine Isopoda have been worked out by Miss Richardson, who enumerates 23 species. About 25 species of Amphipoda were also collected by the Yale party. An undetermined fresh-water ostracode crustacean was found abundantly in a rain-water cistern at Bailey Bay.

† Another remarkable new bryozoan often occurs at Bermuda:

*Amathia Goodei* V., sp. nov. This forms large, intricately branched clusters, 4 or 5 inches high and broad, with the branches thick, soft, and flaccid, and more or less anastomosing, often 2 to 3<sup>mm</sup> in diameter. The zooids are numerous, arranged in large, dense, elongated clusters, composed of several close rows, which often nearly or quite surround the stem, and extend for some distance below the nodes, but are scarcely at all spiral (coll. of G. Browne Goode).

other genera are revised, including certain New England genera and species. Several necessary changes in nomenclature are also made.

In this connection, it may be of interest to mention that a second Bermudian species of lizard, similar to, and perhaps identical with, the Blue-tailed Lizard of the eastern U. States, is in the Yale Museum. As preserved in alcohol, its body is green, without stripes; tail bluish green; head dark brown. Length about 5 inches.

A. E. V.

✓ 2. *Trans. Conn. Acad. Science*, Vol. X, Part 2, pp. 301-698. 1900. New Haven.—This part contains a Revision of certain West Indian Ophiurans with a Faunal Catalogue of all West Indian species, with their distribution (pp. 301-387, 2 plates), by A. E. Verrill; the Hawaiian Hepaticæ of the tribe Jubuloideæ, by Dr. A. W. Evans (pp. 387-463, 16 plates); Notes on some type-specimens of Myxomycetes in the New York State Museum, by W. C. Sturgis (pp. 463-491, pl. 62), and also nine papers relating to the fauna of the Bermudas, noticed below.

3. *Zoological Results based on Material from New Britain, New Guinea, Loyalty Islands and elsewhere*, collected during the years 1895, 1896, and 1897; by ARTHUR WILLEY. Part V (December, 1900). Pp. 531-690. Cambridge, 1899 (University Press).—Part V of this valuable series\* contains the following papers: A description of the Entozoa collected by Dr. Willey during his sojourn in the Western Pacific, by Arthur E. Shipley; pp. 531-568, plates LIV-LVI. On some South Pacific Nemertines collected by Dr. Willey, by R. C. Punnett, pp. 569-584, plates LVII-LXI. On the young of the Robber Crab, by L. A. Borradaile; pp. 585-590, with figures in the text. Anatomy of *Neohelia porcellana* (Moseley), by Edith M. Pratt; pp. 591-602, plates LXII and LXIII. On a new blind snake from Lifu, Loyalty Islands, by G. A. Boulenger; pp. 603-605, with figures in the text. On Crustacea brought by Dr. Willey from the South Seas, by Rev. T. R. R. Stebbing; pp. 605-690, plates LXIV-LXXIV.

#### IV. MISCELLANEOUS SCIENTIFIC INTELLIGENCE.

1. *Leçons de Physiologie Expérimentale*, par R. DUBOIS et E. COUVREUR. Pp. 380, 303 gravures. Paris, 1900 (G. Carré et C. Naud).—With the increasing tendency to teach physiology as an experimental science has come the demand for manuals which will assist the student in his practical work. The volume under consideration is the outcome of the experience gained by the authors in directing the courses in experimental physiology at the University of Lyons. It differs from most of its predecessors in the detail with which the experimental technique peculiar to physiology has been presented. An acquaintance with the more important phenomena of living organisms is assumed, and the directions given are intended to be sufficiently explicit to guide the student in the laboratory. The diversity of topics considered, and more particularly the unusual mode of presentation

\* See this Journal, vii, 79, 322; viii, 398; x, 89.