OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY

Vol. VIII, No. 5

Report of the Director for 1921

HONOLULU, HAWAII
BISHOP MUSEUM PRESS
1922

Bernice P. Bishop Museum

BOARD OF TRUSTEES

ALBERT F. JUDD, President

E. FAXON BISHOP, Vice-President — J. M. DOWSETT, Treasurer

HENRY HOLMES — WILLIAM O. SMITH

RICHARD H. TRENT — WILLIAM WILLIAMSON, Secretary

MEMBERS OF THE STAFF

HERBERT E. GREGORY, Ph.D. - - - - - - - - - - Director

WILLIAM T. BRIGHAM, Sc.D. - - - - - - - Director Emeritus
WILLIAM H. DALL, Ph.D. - - - - - - - Consulting Naturalist
ELMER D. MERRILL, M.S. - - - - - - - Consulting Botanist
OTTO H. SWEZEY, M.S. - - - - - - Consulting Entomologist
CLARK WISSLER, Ph.D. - - - - - - Consulting Anthropologist

ROBERT T. AITKEN, B.S. - - - Research Associate in Ethnology
STANLEY C. BALL, Ph.D. - - - - - - - Curator of Collections
FOREST B. H. BROWN, Ph.D. - - - - - - - - - - Botanist
ELIZABETH WUIST BROWN, Ph.D. - Research Associate in Botany
EDWIN H. BRYAN, JR., B.S., Ph.B. - - Assistant Entomologist
C. MONTAGUE COOKE, JR., Ph.D. - - - - - - - Malacologist
HENRY E. CRAMPTON, Ph.D. - - Research Associate in Zoology
ARTHUR J. EAMES, Ph.D. - - - Research Associate in Botany
CHARLES H. EDMONDSON, Ph.D. - - - - - - - - - Zoologist
KENNETH P. EMORY, B.S. - - - - - - - Assistant Ethnologist
EDWARD W. GIFFORD - - - - Research Associate in Ethnology
RUTH H. GREINER, A.B. - - - - - - Bishop Museum Fellow
EDWARD S. HANDY, Ph.D. - - - - - - - - - - Ethnologist
ELIZABETH B. HIGGINS - - - - - - - - Librarian and Editor
J. F. ILLINGWORTH, Ph.D. - - Research Associate in Entomology
RALPH LINTON, M.A. - - Research Associate in Archaeology
WILLIAM C. MCKERN, A.B. - - Research Associate in Ethnology
BERTHA METZGER - - - - - - - - Assistant to the Director
GEORGE C. MUNRO - - - - - - - - Associate in Ornithology
MARIE C. NEAL, A.B. - - - - - - - Assistant Malacologist
F. L. STEVENS, Ph.D. - - - - - - - Bishop Museum Fellow
JOHN F. G. STOKES - - - - - - - - - - - - - Ethnologist
LOUIS R. SULLIVAN, M.A. - Research Associate in Anthropology
JOHN W. THOMPSON - - - - - - - - - - - - - Preparator
THOMAS G. THRUM - - - - Associate in Hawaiian Folk Lore
STEPHEN S. VISHER, Ph.D. - - - - Bishop Museum Fellow
LAHILAHI WEBB - - - - - - - - - - - - Guide to Exhibits
GERRIT P. WILDER - - - - - - - - Associate in Botany

Report of the Director for 1921

ORGANIZATION OF THE STAFF

During the year 1921 six members were added to the Museum staff; two were granted leave of absence; two resumed their duties after the termination of their leave, and two left the employ of the Museum.

Thomas G. Thrum, who had previously served the Museum as Editor of the Fornander manuscripts, entered upon his duties as Associate in Hawaiian Folklore on January 3, 1921.

C. Montague Cooke, Jr., was in residence at the Museum during July, August, and September. The remainder of the year was devoted to consultation and study of material at mainland institutions, particularly at the Philadelphia Academy of Sciences.

On account of his health, J. W. Thompson, Preparator, was granted a leave of absence from March 1 to the end of the year.

On April 1, 1921, Stanley C. Ball (Ph. B., Sheffield Scientific School and Ph. D., Yale University) was appointed Curator of Collections. After graduation from Sheffield Scientific School, Mr. Ball served as draftsman at the Tortugas Biological Station of the Carnegie Institution and later became Assistant Curator of Zoology, Peabody Museum, New Haven. From 1916 to 1918 he was Instructor in Zoology at Massachusetts Agricultural College and from 1918 to 1921, Professor of Biology at the International Y. M. C. A. College. His publications relate to general biology.

On April 22 Norman E. A. Hinds was appointed Research Associate in Geology for the year 1921. Assisted by a Harvard fellowship Mr. Hinds is engaged in the preparation of a report on the geology of the island of Kauai.

Following five months' leave of absence granted for study at the University of California, Kenneth P. Emory resumed his duties as Assistant Ethnologist on June 1.

On June 1 Edward S. Handy was appointed Ethnologist on the Museum staff. During the preceding year Mr. Handy held the position of Research Associate in Ethnology as a member of the Bayard Dominick Expedition. (See p. 205.)

On account of ill health Helen M. Helvie severed her connection with the Museum on August 1. She has given ten years of faithful and efficient service as the Superintendent of the Exhibition Halls and Guide to Exhibits.

On September 5 Edwin H. Bryan, Jr., rejoined the Museum staff as Assistant Entomologist, a position which he had held for the first half of 1920.

On September 1 Bertha Metzger was appointed Assistant to the Director. While attending the University of California, Miss Metzger was Secretary to the Dean of the College of Mechanics, and department librarian. Most of Miss Metzger's experience has been in the national parks. She was Secretary to the Manager, Yosemite National Park Company, and later became manager of the housekeeping camp and the reservation departments. She was sent from Yosemite to inventory the properties of Sequoia and General Grant National Parks. In 1921 she was Purchasing Agent in Sequoia.

Olga Smith, Secretary to the Director, left the employ of the Museum on September 24.

On December 1 James F. Illingworth (B. S., Pomona College; A. M., Stanford University; Ph. D., Cornell University) was appointed Research Associate in Entomology. Mr. Illingworth has served as head of the department of biology at the Broadway High School, Seattle (1901-1910), and as Professor of Entomology in the College of Hawaii (1912-1917). For the past five years he has held the position of Entomological Investigator for the Government of Queensland. His special interest lies in the field of economic entomology.

During the year it has been found desirable to add to the staff four temporary appointees. Miss Sarah Driver and Miss Mabel Clark served efficiently as catalogers in the library. Spencer Bickerton has acted as preparator during the absence of Mr. Thompson, and Miss Dorothy Hair assisted in the preparation of a catalog of insects.

WORK OF THE STAFF

The time of the Director, Herbert E. Gregory, has been devoted principally to enlarging the local usefulness of the Museum,

carrying out plans for Pacific exploration, and establishing cooperative relations with other institutions. Attention has been given to the preparation for the press of the Proceedings of the First Pan-Pacific Scientific Conference, and to the formulation of editorial rules for the Museum publications. Field trips were made to the islands of Maui, Hawaii, and Lanai, and preliminary geological studies were made of Haleakala, the summit of Mauna Kea, and the Waianae Mountains. In June the Director gave the Commencement Address at the University of Hawaii on "Research and the community" and at the Kamehameha Schools on "The outlook for Hawaiians." An address on "The significance of scientific research in the Pacific" was delivered before the Press Congress of the World on October 18. The Director has continued his service as Chairman of the Committee on Pacific Investigation of the National Research Council and served on the Committee on Program of the Pan-Pacific Educational Conference. To meet obligations to Yale University, the month of January was spent in New Haven and December was devoted to conferences with Federal Commissions, scientific societies and educational institutions on the mainland. During the absence of the Director the administration of the Museum was in charge of Charles H. Edmondson for the period, January 1 to February 15, and of Stanley C. Ball for the month of December.

Since joining the Museum staff in April, Stanley C. Ball, Curator of Collections, has devoted his time chiefly to preparing a much-needed catalog and to classifying the materials for exhibition, student use, and exchange. (See pp. 192 and 196.) While on the mainland Mr. Ball visited several institutions in order to study museum management.

William T. Brigham, Director Emeritus, reports the completion of a manuscript on Hawaiian worship, a work which has been in progress for the past decade.

Elmer D. Merrill, Consulting Botanist, has taken the time from his exacting duties as Director of the Philippine Bureau of Science to prepare for the Museum a statement of the purpose and method of botanical work in Polynesia.

Otto H. Swezey, Consulting Entomologist, has devoted the time at his disposal to the rapidly growing collection of insects.

He has also directed the work of Edwin H. Bryan, Jr., Assistant Entomologist, and of Dorothy Hair who has nearly completed the preparation of a synonymic bibliographic card catalog of Hawaiian insects.

Clark Wissler, Consulting Ethnologist, has given much time and thought to the Museum. Experience gained as Curator of the Department of Anthropology in the American Museum of Natural History has enabled him to give to the Bishop Museum valuable advice regarding the present activities and future development in research and in exhibition.

Robert T. Aitken, Research Associate in Ethnology, has been absent during the year in the Austral Islands as a member of the Bayard Dominick Expedition. He arrived in Papeete on October 30 but was unable to procure transportation to his field of work until January, 1921. On account of severe illness contracted in Tubuai Mr. Aitken returned to Papeete early in May, sailing again for Tubuai on September 13. For the remainder of the year investigations were continued in Rurutu, Raivavae and Tubuai. The Museum has received from Mr. Aitken some valuable specimens and manuscripts.

Forest B. H. Brown, Botanist, has devoted the year to a study of the flora of the Marquesas with special reference to its bearing on the migration of the Polynesian race. He is accompanied by his wife, Elizabeth Wuist Brown, Research Associate in Botany. See p. 208.)

Since his return to the staff, Edwin H. Bryan, Jr., Assistant Entomologist, has mounted and labelled some 6,000 specimens of Australian insects collected by J. F. Illingworth, and has arranged for study about 16,000 Hawaiian insects, the accumulation of six or eight years of collecting by members of the Museum staff. Mr. Bryan has also undertaken the considerable task of cataloging approximately 2000 photographic negatives and of developing a check system for instruments.

C. Montague Cooke, Jr., Malacologist, devoted a large part of the year to a study of the shells and the anatomy of Zonitidae and Succineidae. This work was done at the Philadelphia Academy of Natural Sciences where a rich collection of material is available for comparison. The time spent in Hawaii was given to catalog-

ing, naming collections, and to field work which has yielded interesting results. (See p. 209.) Mr. Cooke's study of six species of Succineidae and of three of the rarest genera of Zonitidae found in the islands was published by the Museum as Occasional Papers Volume VII, Number 12.

Henry E. Crampton, Research Associate in Zoology, has continued his work on the variation, evolution and distribution of the genus Partula. Two months were spent on Guam and a short visit was made to Saipan. A study of the material from this part of the Pacific gives some interesting results. (See p. 210.)

Arthur J. Eames, Research Associate in Botany, was prevented by serious illness from carrying out his plan for the study of the flora of Tonga as a member of the Bayard Dominick Expedition. An attack of dysentery at Apia forced his return to the United States. In the short time available for work Mr. Eames collected about 1,200 sheets of Samoan plants and made some useful observations on the reliability of plant names as a guide to race migrations.

Charles H. Edmondson, Zoologist, has devoted much time during the year to arranging and classifying the zoological material in the Museum and to enriching the collections by exchange and by field studies. (See p. 200 and p. 211.) In addition to his exacting duties at the University of Hawaii and at the Marine Biological Laboratory, Mr. Edmondson has found time to deliver twelve public lectures on the marine fauna of Hawaii and to prepare two papers: "Stomatopoda in the Bishop Museum" and "Hawaiian Dromiidae" which have been issued as Occasional Papers Vol. VII, No. 13, and Vol. VIII, No. 2.

Since returning from graduate study at the University of California, Kenneth P. Emory, Assistant Ethnologist, has made an archaeological and ethnological survey of the island of Lanai. The results include a map of the island, a list of place names, a relationship tree including every native on Lanai, and a record of all petroglyphs and ruins. Of the value of this work Dr. Clark Wissler remarks, "There is every reason to believe that the story of the Polynesian on Lanai will be a cross-section of his career elsewhere."

Edward W. Gifford, Research Associate in Ethnology, returned from Tonga in June after a nine months' study of the religion and social organization. He reports the collection of an unexpectedly large amount of data bearing on the history of the Polynesians. The results of his work are in preparation for publication. (See p. 207.)

Ruth H. Greiner, Bishop Museum Fellow, has made considerable progress in her study of Polynesian designs on carved and decorated objects. The Marquesan and Hawaiian designs have been analyzed into "design elements," and materials from other parts of Polynesia are being studied, with a view to throwing light on migrations.

Edward S. Handy, Ethnologist, returned in October from the Marquesas, where he spent nine months as a member of the Bayard Dominick Expedition. The time since his return has been devoted to the preparation for publication of his material on religion, social organization, and linguistics. Mrs. Handy, volunteer associate with the Marquesan party, made a special study of the tattooing and household arts of the Marquesans. (See p. 205.)

J. F. Illingworth, Research Associate in Entomology, has devoted his attention to the arrangement and study of the large collection of insects obtained by him in Australia. (See p. 202.)

Ralph Linton, Research Associate in Archaeology, returned in August from a year of intensive study of the archaeology and material culture of the Marquesas. In addition to notes, maps, and photographs, Mr. Linton brought back many valuable specimens of ethnologic interest. By the end of the year a large part of his results was in manuscript awaiting revision and publication in the series of reports of the Bayard Dominick Expedition.

After a year's field investigation as a member of the Bayard Dominick Expedition, W. C. McKern, Research Associate in Ethnology, returned to Honolulu in June. The months of July, August, and September were spent at the Museum in a comparative study of collections and of library material. The remainder of the year was devoted to the preparation of a manuscript on the primitive material culture and archaeology of the Tongans.

G. C. Munro, Associate in Ornithology, has continued to make records of native and migratory birds. In an effort to find the

unique bird (*Dysmorodrepanis munroii*) many trips were made in the forest region of Lanai and a trail was cleared in the Kaiholena valley where this bird was last seen.

During the absence of Mr. Cooke, Marie C. Neal, Assistant Malacologist, has been in charge of the collection of land shells. Her laboratory work has consisted of cataloging, preparing material for study, and arranging specimens for exchange. Field work included collecting trips to Kauai and to windward Oahu. In connection with her investigations Miss Neal carried on graduate work at the University of Hawaii.

F. L. Stevens, Bishop Museum Fellow, spent five months on the islands of Hawaii, Kauai, Oahu, and Maui, in a field and laboratory study of Hawaiian fungi. At the close of the year his large collection had been classified and part of his manuscript report completed.

John F. G. Stokes, Ethnologist, has spent the year in field studies as a member of the Bayard Dominick Expedition. He arrived in Tahiti October 30, 1920, but inability to procure transportation delayed his arrival at Rurutu until December 25. After three months' stay in this island Mr. Stokes went to Rapa by way of Rimatara. Since April 15, 1921, no communication has been received from him.

The program for the study of physical anthropology begun in 1920 by Louis R. Sullivan was continued during the present year. Altogether nearly 11,000 persons have been examined to furnish data on physical characteristics, race mixture and racial differences in growth. To supplement the material obtained in Hawaii, the collections in Peabody Museum (Cambridge) were studied. Mr. Sullivan completed two papers, "A contribution to Samoan somatology" and "A contribution to Tongan somatology." (See pp. 185 and 186.) Mr. Sullivan was the delegate from the Bishop Museum to the Second International Eugenics Congress held in New York, and was in charge of the exhibit of Hawaiian casts, photographs, and diagrams which were prepared under his personal direction. (See p. 191.)

During the year Thomas G. Thrum studied the Poepoe collection, consisting of 42 manuscripts, and submitted a report on their condition and merit with reference to publication. Much time was

also given to the assembling of data regarding the use of astronomy by early Hawaiian voyagers. Several Polynesian vocabularies submitted for publication were also studied. A large part of Mr. Thrum's time was spent on the preparation of a list of geographic terms for the revision of Andrews' Hawaiian Dictionary. (See p. 190.)

In his study of tropical hurricanes Stephen S. Visher, Bishop Museum Fellow, has collected published and unpublished data at Honolulu, Suva, Melbourne, Manila, Hongkong, Shanghai, Kobe, and Tokio. In addition to popular articles he plans to prepare for publication by the Museum a monograph on tropical cyclonic storms of the Pacific.

Gerrit P. Wilder has continued his valued activities in enriching the Museum collection of fruits and plants and has used his expert knowledge in providing correct labels for the casts of fruits in the exhibition halls.

Elizabeth H. Higgins, Librarian and Editor, has supervised the reclassification and cataloging of the library and has shared the burden of preparation of manuscript for the press. The distribution of publications has demanded an unusual amount of attention. (See pp. 187 and 212.)

Before entering upon his leave of absence, John W. Thompson, Preparator, enriched the Museum collections by the addition of casts and models. (See p. 202.)

In addition to her routine duties as Assistant to the Director, Bertha Metzger has assisted in preparing for publication the Proceedings of the First Pan-Pacific Scientific Conference and the revised Hawaiian Dictionary, and has assumed charge of proofreading.

Since the retirement of Helen M. Helvie on August 7, Lahilahi Webb has held the position of Guide to Exhibits. Ably assisted by Anna Ho, she has served as hostess to an increasing number of visitors. The influential position in the community held by Mrs. Webb has greatly assisted in bringing the Museum and the Hawaiians into sympathetic relations. Her intimate knowledge of the Hawaiian language and history has been continuously utilized by members of the staff and by visitors to the exhibition halls.

Valuable assistance has come to the Museum from men not officially on the staff.

Rev. E. E. V. Collocott, President of the Tubou College, Nukualofa, Tonga, has prepared two papers, "Proverbial sayings of the Tongans" and "Tongan astronomy and calendar," for publication by the Museum. (See p. 187.)

Commander J. C. Thompson, U. S. N., in charge of the naval hospital at Guam, a well known student of natural history, has offered his services as collector and as recorder of anthropological data in Guam.

Mr. D. Wesley Garber, Chief Pharmacist's Mate, U. S. N., has taken advantage of his stay in Samoa to obtain anthropometic records and to make collections for the herbarium.

The Museum is under obligations to Mr. H. D. Skinner, Lecturer in Anthropology at the University of Otago. Mr. Skinner found it impracticable to serve as a member of the Bayard Dominick Expedition but at the request of the Museum he undertook a field and laboratory study which has resulted in a valuable manuscript on "The Moriori of Chatham Islands."

PUBLICATIONS

During 1921 the following publications were issued:

MEMOIRS VOLUME VIII, NUMBER 1. A monographic study of the genus Pritchardia, by Edoardo Beccari and Joseph F. Rock, 77 pages, 24 plates, 1 figure, 1921.

Systematic discussion of the palm, Pritchardia, a characteristic feature of the Polynesia flora; 74 per cent of the genus is endemic in Hawaii.

MEMOIRS VOLUME VIII, NUMBER 2. A contribution to Samoan somatology, by Louis R. Sullivan. Bayard Dominick Expedition Publication Number 1. 20 pages, 2 plates, 1 figure, 1921.

A discussion of the physical characters and racial affinities of the Samoans, based on the examination of 93 native adults by E. W. Gifford and W. C. McKern.

OCCASIONAL PAPERS VOLUME VII, NUMBER 10. Fish poisoning in the Hawaiian islands, with notes on the custom in Polynesia, by John F. G. Stokes, 17 pages, 3 plates, 1921.

A description of preparation and application of poison obtained from the plants *auhuhu* and *akia*.

OCCASIONAL PAPERS VOLUME VII, NUMBER 11. An archaeological survey of Haleakala, by Kenneth P. Emory, 25 pages, 4 plates, 3 figures, folded map, 1921.

The location and description of many stone structures hitherto undescribed. Includes revised list of place names.

OCCASIONAL PAPERS VOLUME VII, NUMBER 12. Notes on Hawaiian Zonitidae and Succineidae, by C. Montague Cooke, Jr., 17 pages, 2 plates, 5 figures, 1921.

A revision of two families of Hawaiian land shells based on anatomical studies. Two new genera and five new species are described.

OCCASIONAL PAPERS VOLUME VII, NUMBER 13. Stomatopoda in the Bernice P. Bishop Museum, by Charles Howard Edmondson, 24 pages, 2 figures, 1921.

The relationship and distribution of six genera and nine species of Squillidae are discussed. One new species is described.

OCCASIONAL PAPERS VOLUME VIII, NUMBER 1. Report of the Director for 1920, by Herbert E. Gregory, 28 pages, 1921.

SPECIAL PUBLICATION NUMBER 7. Proceedings of the First Pan-Pacific Scientific Conference (in three parts), 949 pages, 21 figures, 1921.

The proceedings read at the Scientific Conference held at Honolulu, Hawaii, August 2 to 20, 1920. Part I includes an historical introduction, the organization and minutes of the general session and the sections, list of delegates, papers on race relations in the Pacific, on Hawaiian fauna and flora, botany, and fisheries, and also chapters on biological stations with plans for biological work in the Pacific. Part II contains chapters on volcanology, seismology, meteorology, oceanography, ocean currents in relation to organisms, and mapping the Pacific. Part III is devoted to discussions of the status of areal geological surveys and correlations of Post-Cretaceous formation of the Pacific region and to symposia on means and methods of co-operation and training of scientists for Pacific work.

Pages 1-49 of Part I, containing organization, summarized proceedings, resolution and personnel, are published as a separate pamphlet.

The following publications are in press. They will appear early in 1922:

MEMOIRS VOLUME VIII, NUMBER 3. Grasses of Hawaii, by A. S. Hitchcock, 131 pages, 5 plates, 110 figures.

Describes 50 genera of native and introduced grasses.

MEMOIRS VOLUME VIII, NUMBER 4. A contribution to Tongan somatology, by Louis R. Sullivan, 30 pages, 4 plates, 1 figure.

Describes the physical characteristics of 225 Tongans, and discusses the relation of Tongans to Samoans and to Melanesians.

OCCASIONAL PAPERS VOLUME VII, NUMBER 14. Dermaptera and Orthoptera of Hawaii, by Morgan Hebard, 76 pages, 2 plates, 1 figure.

A study based on 688 specimens representing 40 of the 41 genera and all but two of the adventive species recorded for Hawaii.

OCCASIONAL PAPERS VOLUME VIII, NUMBER 2. Hawaiian Dromiidae, by Charles Howard Edmondson, 10 pages, 2 plates.

Discussion of the taxonomic position, characteristics and distribution of the Dromiidae of Hawaiian waters. One new subspecies is described.

OCCASIONAL PAPERS VOLUME VIII, NUMBER 3. The proverbial sayings of the Tongans, by E. E. V. Collocott and John Havea.

An epitome of Tongan mental reactions as expressed in 633 proverbs given in the Tongan dialect with translation and comment in English.

The following papers are in the hands of the Editor:

Secondary xylem of Hawaiian woods, by Forest B. H. Brown.
Material culture of the Morioris of the Chatham Islands, by H. D. Skinner.
Tongan astronomy and calendar, by E. E. V. Collocott.
Hawaiian dictionary.

Papers in preparation include the following:

Tongan ethnogeography, by E. W. Gifford.
Tongan society and religion, by E. W. Gifford.
Tongan material culture and archaeology, by W. C. McKern.
Marquesan material culture, by Ralph Linton.
An outline of Marquesan ethnology, by Edward S. Handy.
Studies in Hawaiian anthropology, by Louis R. Sullivan.
Archaeology and ethnology of Lanai, by Kenneth P. Emory.
Polynesian design, by Ruth H. Greiner.
Hawaiian fungi, by F. L. Stevens.
A Rarotongan dictionary, by S. Percy Smith.
Palmyra crustacea, by Charles Howard Edmondson.

In the titles of Museum publications two changes are made: (1) The books and pamphlets heretofore listed as Miscellaneous Publications have become Special Publications; (2) the series of Occasional Papers will, after the completion of Volume VIII, be continued as Bulletins. No change is contemplated in the Memoirs.

The liberal policy adopted by the Trustees has resulted in an unprecedented call for the publications of the Museum. During the year 3,236 numbers of Memoirs were distributed including 96 complete sets; 6,561 numbers of Occasional Papers, including 83 complete sets; 748 numbers of Fauna Hawaiiensis including 41 complete sets, and 607 copies of other special publications. The regular distribution of publications at time of issue has been about 300. To the regular exchange list which now numbers 161, the names of the following institutions have been added: Arnold Arboretum, Jamaica Plain, Massachusetts; British Museum of

Natural History, London, England; College of Science, Imperial University, Tokyo, Japan; Danish Biological Station, Copenhagen, Denmark; Danish Natural History Association, Copenhagen, Denmark; Gesellschaft fur Erdkunde zu Berlin, Berlin, Germany; Historical Society of Victoria, Melbourne, Victoria, Agricultural Research Institute, Pusa, Bihar, India; Instituto do Butantan, Sao Paulo, Brazil; Journal Officiel des Establissements Oceaniennes, Papeete, Tahiti; Kyoto Imperial University, Kyoto, Japan; Lyon Museum des Sciences Naturelles, Lyons, France; Marine Biological Laboratory, Woods Hole, Massachusetts; Musée Coloniale de Marseille, Marseilles, France; Musée Royale d'Histoire Naturelle, Brussels, Belgium; Museo Civico di Storia Naturali di Genova, Genoa, Italy; Museo Nacional, Mexico City, Mexico; Museum National d'Histoire Naturelle, Paris; Puget Sound Biological Station, Seattle, Washington; Real Sociedad Geografica, Madrid, Spain; Royal Colonial Institute, London, England; Royal Geographical Society of Queensland, Brisbane, Queensland; Royal Horticultural Society, London; Royal Scottish Geographical Society, Edinburgh, Scotland; Societa Italiana di Scienze Naturali, Milan, Italy; Société de Géographie Commérciale du Havre, Le Havre, France; Société National d'Acclimation de France, Paris; University of Nebraska, Lincoln, Nebraska; and University of Washington, Seattle, Washington.

Classified by subjects the publications received from these institutions—serials that will continue to be received currently—are: ethnology, 2; natural history, 13; general science, 4; geography, 7; botany, 3.

SPECIAL TOPICS

Bishop Museum Fellowships

Of the four Bishop Museum Fellowships founded by Yale University in cooperation with the Museum three were filled for the year 1921. F. L. Stevens, Professor of Plant Pathology, University of Illinois, conducted researches on Hawaiian fungi to supplement his previous work done in the American tropics. Ruth H. Greiner, graduate student at the University of California, has devoted her attention to design elements in Polynesian carving, painting, and decoration. Stephen S. Visher, Professor of Geog-

raphy, University of Indiana, has visited Suva, Melbourne, Manila, Hongkong, Shanghai, Kobe, Tokyo, and Honolulu in search of data bearing on the problem of tropical hurricanes as a factor in the distribution of life in the Pacific.

As indicated by the reports of progress and by incomplete manuscript submitted the holders of these fellowships have been enabled to make clearly defined contributions to the knowledge of the Pacific. This pioneer method of adding eminent specialists to the group of Pacific workers has received general approval as part of a constructive program. The National Research Council has called the attention of eight universities to the desirability of establishing similar fellowships, and at the request of the Council the Director has visited five of these institutions for personal conference.

Pan-Pacific Scientific Conference

The relations of the Museum to the First Pan-Pacific Scientific Conference described in the Report of the Director for 1920, pp. 15-16, continue. The request of the Conference that the Museum "publish and distribute the reports, papers and proceedings" has been fulfilled by the publication of the Proceedings of the Conference. (See p. 186.) Accumulating evidence shows that the work of the Conference is a constructive contribution to scientific research in the Pacific, and that the published Proceedings will find large use. Acting as "representative of the members of the Conference after its adjournment" the Bishop Museum has furnished information by correspondence and through scientific journals in regard to activities and plans within the scope of the Conference, has kept closely in touch with the Committee on Future Conferences, and is actively cooperating with the National Research Council and with scientific bodies of other Pacific countries in plans and projects designed to bring to fruition some of the resolutions passed at the Conference.

Manuscripts and Literary Notes of William Churchill

The late William Churchill, whose researches in Polynesian geography, linguistics, and folklore indicate a scholar of unusual attainments, bequeathed to the Carnegie Institution of Washington his manuscripts, notes, and papers. This material has been lent to

the Museum with a view to the completion of the investigation on which Mr. Churchill was engaged at the time of his death which occurred August 10, 1920. The inventory embraces 38 items. Among the manuscript are translations of legends and genealogies in Samoan and other dialects, manuscripts on the Pacific colonies of Germany, Samoan relations, Tanumafile succession and miscellaneous historical, philological, and political papers. Perhaps the most valuable of Mr. Churchill's bequests is some 30 boxes of cards representing the progress made toward the preparation of a Samoan-English dictionary.

Hawaiian Dictionary

Interest in Polynesian linguistic studies and the need of an authoritative reference book for the spelling, pronunciation, and definition of Hawaiian words led to arrangements for revising Andrews' Hawaiian Dictionary, issued in 1865 and long out of print. Supported by a legislative grant of $25,000 revision has been in progress since January, 1915, under the direction of the Board of Commissioners of Public Archives, who placed Rev. Henry H. Parker in charge of the work.

At the request of the Board in May, the Museum assumed the responsibility of completing the revision and of publishing the work. In addition to the task of preparing for the press the manuscript and notes transmitted by the Board the Museum has agreed to furnish a list of Hawaiian geographical names with pronunciation and definition. To make this list authoritative all accessible sources were examined including the Mahele or Book of Awards and the original records of the Land Office and of the Survey Department. Mr. Thrum, on whom the burden of this work has fallen, acknowledges the helpful cooperation of Mr. Joseph S. Emerson, Mr. Stephen Mahaulu, Mrs. Lahilahi Webb, Mr. L. A. Dickey, Mr. Thomas C. White and Mr. Theodore Kelsey.

The Gartley Collection of Photographs

The gift by Mrs. Alonzo Gartley of the photographic negatives taken by her husband is worthy of special mention. The collection consists of 649 large negatives and panoramic views of Hawaiian landscapes, plants, and native peoples, all of which

demonstrate exceptional skill in composition and execution. For the subjects treated the Gartley collection is doubtless the most valuable in existence. It constitutes a suitable memorial of an enthusiastic student of Hawaiian natural history.

Photographs in the Museum

The enlargement of the Museum activities and its cooperative contacts recently established with similar institutions have increased the call for photographic prints for use as illustrations and for comparative studies. To meet this need the preparation of a catalog of photographs, begun in 1920, has been continued. A record, including description, title, date, and the name of the photographer, has been supplied for photographs taken since 1919 and so far as practicable for those taken previous to that date. Of the partly cataloged collection of 2,780 negatives made by members of the staff before 1920, about 2,200, chiefly of specimens in the Museum and subjects of personal interest, have been credited to Dr. Brigham; 510, ethnological subjects, to Mr. Stokes; and 72, botanical subjects, to Mr. Forbes, 1,109 negatives were added in 1920 and 2,013 in 1921.

In addition to large numbers of photographs of historical subjects the Museum files include about 5,900 negatives of value for scientific study and about 600 prints of which the negatives are not the property of the Museum. In regular course the negatives made by members of the staff will increase in number and value but it seems desirable to provide for students interested in the Pacific studies by building up the collection of prints from outside the Museum.

Exhibition at the Eugenics Congress

With the cooperation of the University of Hawaii, Punahou Schools, and Kamehameha Schools, the Museum prepared a rather elaborate exhibit of the racial types in Hawaii to be sent to the Second International Congress of Eugenics held in New York City, October, 1921. The exhibit consisted of a full figure of David Kahanamoku, 54 busts cast from life by Gordon C. Usborne, 7 large charts dealing with population, intermarriage, and vital statistics, and a large number of photographs. Chinese, Japanese,

Koreans, Filipinos, Portuguese, Americans, Hawaiians, and the numerous Hawaiian mixtures are represented in the casts and photographs.

The exhibit arrived in New York in October, 1921, and was placed in the American Museum of Natural History in the Hall of the Age of Man where the sessions of the Congress were held and is still retained as a special exhibit. The American Museum has been given permission to duplicate the exhibit, after which it will be returned to the Bishop Museum.

In supplying subjects for the casts and photographs cordial cooperation has been received from leaders among the different racial groups. Special mention should be made of Dr. Iga Mori, Rev. S. Y. Whang, and Miss Whang, Rev. B. P. Makapagal, Mr. Lee Toma, President Dean of the University of Hawaii, President Griffiths of Punahou, Principal Wood of the Normal School, Principal Givens of McKinley High School, Mrs. Max Carson, and Mr. F. D. Lowrey. The Kamehameha Schools as represented by President Webster, Principal Bartlett, and Principal Newton have been responsible in large measure for the successful completion of this project.

Pacific Bird Life

The Whitney South Seas Expedition of the American Museum of Natural History is engaged in a comprehensive study of the bird life of the islands of the Pacific. Through the generosity of the American Museum duplicate series of birds, of other zoological materials, and of plants obtained by the Expedition will serve to enlarge the collections of the Bishop Museum.

Fortunately the Bishop Museum is able to cooperate by supplying the American Museum with representative material from the Hawaiian Islands and to a small extent from other parts of the Pacific.

The Museum Collections

The funds of the Museum are expended on two closely related activities: (1) the gathering and care of scientific materials, and (2) investigation. The collections are not only permanent records of vanishing things and objects of educational significance but they constitute source materials from which investigation derives much of its value. They demand special attention, for the

worth of collected material is decreased or even destroyed by the absence of complete and easily accessible records of the original history.

The method adopted by most museums for preserving, preparing for use, and exhibiting materials is to organize the staff as a group of curators, each one charged with responsibility for the particular class of objects about which his knowledge or interest centers. For institutions whose interest is solely in the storage and public exhibition of materials and for museums whose activities call for departmental staffs, this system has obvious advantages but it seems to be not so well adapted to institutions with small staffs engaged in a variety of tasks. For the Bishop Museum at least this organization has not proved satisfactory; the divided responsibility resulted in careful attention to some classes of materials and neglect of others and a lack of systematic plans for building up the collections with reference to the needs of students in Hawaii and elsewhere.

As indicated in the Report of the Director for 1920 it has been found desirable to merge the various curatorships into one Curator of Collections who has charge of all collections belonging to the Museum except the books and photographs. The position is difficult to fill, for it calls for an experienced scientist whose attainments include familiarity with the needs and practice of educational institutions and artistic skill regarding the adequate display of exhibition material. The Museum is fortunate in filling the newly made position by the appointment of Stanley C. Ball. As a preliminary study the Curator of Collections has examined all collections belonging to the Museum with a view to providing a permanent record and a classification into the groups: material for exhibition, material for study, and material for exchange. The admirable Preliminary Catalogue prepared by William T. Brigham and published in 1892-93, in which are listed all the ethnological and natural history specimens of the Museum at that period of its history, and also photographs, portraits, relics, and items of historical interest, is being used as a basis for this work. Additional sources are the lists of accessions publihed in the annual report of the Director since 1899 and the accession records kept by members of the staff. Fortunately for some classes of material a full and

accurate catalog has been kept and for other collections it has been possible to obtain sufficiently complete information to supply the data required for labeling.

The Museum and the Public

Beginning with the year 1919, an effort has been made to bring the Museum into closer contact with the people of Hawaii, using its resources to enlarge the educational facilities of the Territory and to increase public interest in the study and preservation of the record of the Polynesian race. The response of the public to this desire to render a larger service has been gratifying. The number of visitors to the exhibition halls is increasing; the use of study collections and consultation with members of the staff by amateur and professional scientists is becoming more frequent; and the Museum's publications are finding more readers.

Analysis of the records of attendance in the exhibition halls as presented in the Annual Reports of the Director present some interesting information. From 1899 to October, 1911, the halls were regularly open to the public two days a week. For the first year of record (1899), the number of visitors was 8,399 and the average for the first five years (1899-1903) was 7,538. For the next eight years (1904-1911) the average attendance was 11,659 with a maximum of 14,296 in 1905—a significant increase attributed to the attractive exhibits in the newly constructed Hawaiian Hall. Beginning with October, 1911, and extending to September, 1919, the Museum was open five days a week during which period the records show an average yearly attendance of 14,619 with a maximum of 15,657 in 1917. For the past four years the attendance has been: 1918, 14,029; 1919, 19,074; 1920, 29,159; 1921, 30,313. This marked increase is partly due to the decision to open the Museum seven days a week and to enlarged tourist travel but seems to be principally the result of increased interest on the part of the public.

As might be expected the white population makes most use of the exhibition halls, constituting roughly 48 per cent of the attendance since the founding of the Museum. During the past ten years it has exceeded 50 per cent except for the war years, 1918 and 1919. The number of Japanese visitors first became

conspicuous in 1904, and since that date has averaged about 19 per cent of the total attendance with a high record of 34 per cent in 1909. For the Chinese the largest attendance is recorded for 1904 and 1905, during which years representatives of this race made up nearly 18 per cent of the total attendance. Since 1905 the percentage of Chinese has gradually decreased to about 7 per cent in 1921. The percentage of Hawaiians likewise decreased from about 17 per cent in 1904 to 10 per cent in 1917 but rose again to 15 per cent during the past two years. Classified by races the attendance for 1921 was: white, 16,993; Hawaiians, 4,847; Chinese, 2,148; Japanese, 5,696; others, 629; total, 30,313. It is interesting to note that the number of Japanese visitors for the year is 889 less than for 1920 and only 1,696 more than for 1909 (4,000), the largest recorded previous to 1920. The Chinese attendance reached a maximum (2,527) in 1905, and has been less than 2,000 except for the periods 1904-1906 and 1919-1921. The attendance of Hawaiians shows a gratifying increase. For the period 1899-1918 the average number was 1,462, being greatest in 1904 and 1905. For the past three years the figures are 1919, 3,090; 1920, 4,229; 1921, 4,847. As compared with 1918 (1,867) an increase of 2,980 or over 250 per cent is recorded.

The attendance in proportion to the population compares favorably with that of other museums but in one respect the record is unsatisfactory. In some mainland museums children of school age constitute as much as 50 per cent of the visitors; at the Bishop Museum the proportion is very much smaller. It is the hope of the Director that excursions to the Museum supplemented by informal lectures by teachers and by members of the Museum staff may attain an established place in the course of study of public and private schools.

In another respect the attitude of the public toward the Museum is gratifying. Whenever called upon to assist in the work of the Museum representative citizens of the territory have generously responded. In fact much of the field work done during the year was made possible by the cooperation of such men as Donald Macalister of Kukaiau ranch, A. W. Carter of Parker ranch, Samuel A. Baldwin and Harry A. Baldwin of Maui, George

C. Munro of Lanai, George P. Cooke, A. L. C. Atkinson, and C. S. Judd.

The members of the parties working outside of Hawaii report that after the scope and aims of the Museum become known, a cordial response is received from government and church officials, merchants, and leading citizens. In no small degree the successful outcome of the work of the Museum in Tonga, the Marquesas, Samoa, and Tahiti is due to the fact that information and facilities for work otherwise unobtainable have been freely provided.

Successful working arrangements with institutions on the United States mainland and in other countries and the gifts to the collections and library listed in this report testify to the growing confidence in the Museum as an institution devoted to the advancement of knowledge in the Pacific.

REPORT OF THE CURATOR OF COLLECTIONS

The Curator of Collections, Stanley C. Ball, has submitted the following report:

Accessions 1921

Anthropological Material

Additions to the collections illustrating physical anthropology include a skeleton from Mokapu Peninsula, Oahu, presented by Mr. H. Gregson, ten skulls from the Marquesas collected by Ralph Linton, and six skeletons from Tonga collected by W. C. McKern and E. W. Gifford.

The ethnological collections have been enriched by gifts as follows:

Mr. A. L. C. Atkinson, old outrigger canoe; Mr. S. A. Baldwin and Mr. A. F. Judd, 12 sling stones from Haleakala; Miss Pleiades Colburn, stone image representing head of Kamehameha I; Mr. C. H. Cooke, Jr., small image carved from fish jaw, second of its kind received, from Molokai; Mrs. Arthur Curtiss James, Hawaiian bed tapa and calabashes; Mr. A. F. Judd, wooden bowl and spoon from the Philippines, 1 Fijian club, 28 escutcheons, 7 sinkers for octopus hooks, 1 awl, stone artifacts from Molokai; Mrs. A. F. Judd, carved wood, probably Polynesian; Mr. C. S. Judd, olona bark; Mr. Philip Kaauwai, 3 ulumaika, 5 fish-hooks, olona fish line, leiomano, mat, calabash, and cane; Rev. Y. S. Mark, ornamental comb from Tonga; Rev. R. C. Page, comb from Tonga; Outrigger Canoe Club, 2 old outrigger canoes; Mrs. Anthony Richley, 1 salt pan, 2 sling stones, 2 ulumaika; Rev. A. M. Saunders, kawa cup from Tonga; Mr. Philip E. Spalding, small image of human head carved on a fish jaw, the first of its kind received, from Molokai; Mrs. E. J. Walker, portion of a hat made of split maidenhair fern stems, received through Kenneth P. Emory, November, 1920.

Ethnological material collected by members of the staff includes the following:

Bayard Dominick Expedition—Austral Islands party, 4 boxes of artifacts and wood samples. (Reserved for description in the 1922 Report); Bayard Dominick Expedition—the Marquesas party, 306 specimens from the Marquesas islands of which the following may be mentioned: 4 large wooden tribal gods, 7 carved house posts, 30 food pounders, 49 adz heads, 3 chisels, 10 tapa beaters, bed of fire-plow, paddle club from burial cave, tunable flute, 3 carved wooden bowls, stone tapa anvil, wooden drums, several ear and wrist ornaments, crowns, necklaces, 13 tapa, 2 pandanus mats. Bayard Dominick Expedition—Tonga party, 3 adzes, 1 adz haft, 9 adz heads, 3 baskets, 6 war clubs, club (Samoan or Fijian?), staff, paddle, tapa beater, nose flute, 4 sail needles, 5 fish-hooks, 2 octopus catchers, 2 tapas, 18 samples of rope and cord, pebbles and fragments of pottery, bone and shell from graves, 101 shells from mollusks used by the Tongans in the arts or as food; Kenneth P. Emory, 2 bowling stones, 97 sling stones, 3 unidentified stone artifacts collected on the island of Maui September 1920, and 3 lots of artifacts from the island of Lanai to be described in the 1922 report.

Purchases for 1921 are 2 old finger bowls, 7 poi bowls and pestle belonging to Queen Emma, and a collection consisting of 2 adz heads, sinker, stone lamp, 4 ulumaika discovered in an excavation at Kaimuki, Oahu.

By exchange 14 stone implements representative of the mound builders were received from Prof. W. H. Sherzer of the Michigan State Normal School.

Materials of ethnological and historical interest placed on deposit and classified on the Museum records as loans consist of the following collections: Mrs. Laura Buffandeau, 2 feather lei, enlarged photograph of Nancy Sumner, oil portrait of Maneiula Sumner, old English Bible (MDCCXII), lithograph of the funeral of Kamehameha III, letters and papers, 2 silk kihei, bronze seal of Republic of Hawaii, bow of Mohawk Indians, poisoned arrow, Korean pipe, carabao horns, portraits of Kamehameha I, and of Pomare of Tahiti, framed certificate; Mr. S. M. Damon, 490 specimens chiefly Hawaiian; a few from other Polynesian islands, Micronesia, Philippines, China, Alaska, South Africa, and Europe (see p. 202); Mr. A. F. Judd (Hawaiian specimens except as otherwise indicated), 3 wooden platters, 10 calabashes, 2 spears, 1 carrying stick, 1 adz head, 1 poi pounder, 1 pestle, 2 kukui nut lei, 2 cowry lei, 1 ivory lei, 1 string shell money, 1 dagger, 2 Philippine swords, 1 string of shell money from Gilbert Islands; Liliuokalani Estate, royal coach, harness and livery; 2 royal standards, songs and stories of Liliuokalani, other songs, 6 certificates of membership of J. O. Dominis, escutcheon, 3 books, trinkets, 6 photograph albums, mounted photographs, documents, relics, and miscellaneous specimens.

BIRDS

The following specimens have been added to the ornithological collections: 34 birds' eggs from Forfarshire, Scotland, presented by Mr. William M. Bush; 4 Hawaiian bird skins, presented by Mr. Albert F. Judd; fossil egg from Laysan guano bed, placed in the Museum by Mr. S. M. Damon;

a dried apapane (*Himatione sanguinea*), collected by Herbert E. Gregory on the summit of Mauna Kea; pheasant cuckoo (*Centropus phasimus*), stone plover (*Burhinus grallarius*), and kingfisher (*Dacelo leachii*), from Queensland, collected by J. F. Illingworth.

INSECTS

From the carefully kept record of Otto H. Swezey, Consulting Entomologist, the following list of accessions for 1921 has been abstracted. It will be noted that most of the new material came from foreign sources.

Collections by members of the Museum staff include 315 Hawaiian insects, 77 North American specimens collected by Edwin H. Bryan, Jr., while on the way from Connecticut to Hawaii, and 12 specimens from Tongatabu collected by Mrs. Delila S. Gifford.

Material received in exchange came from the following sources: Boston Society of Natural History, 28 North American Trypetidae; Dr. W. E. Britton, 3 specimens of *Eutreta sparsa;* Mr. B. Preston Clark, 1451 specimens, mostly Coleoptera, collected by Mr. J. August Kusche on the islands of Kauai, Oahu, and Hawaii; Mr. W. M. Davidson, 56 North American Syrphid flies.

The following donations have been gratefully acknowledged: Mr. W. M. Giffard, a collection of about 1500 mounted specimens from Samoa; Mr. W. H. Meinecke, 6 Hawaiian ant lions, 4 *Triatoma rubrofasciata;* Peabody Museum of Yale University, 801 specimens of typical North American insects; United States National Museum, 2 specimens of *Eutreta sparsa.*

A series of approximately 20,000 specimens of Australian insects has been deposited in the Museum by their collector, J. F. Illingworth. Most of them are mounted and have been labeled by Mr. Illingworth assisted by various Australian entomologists.

A collection consisting of 270 types and paratypes of the 171 species of Sierola have been given by Mr. David T. Fullaway. They include the species described by Mr. Fullaway in "New species of Sierola with explanatory notes" (B. P. Bishop Museum, Occ. Papers Vol. VII, No. 7, 1920).

The Museum has purchased from Mr. W. M. Giffard a collection of several thousand specimens representing the chief order of insects of the Oriental, Malayan, and Polynesian regions.

The seven small lots of insects collected by J. August Kusche from Solomon, Thursday, and Prince of Wales islands (see report of the Director for 1920, p. 22) have been returned to Mr. Kusche.

PLANTS

Hawaiian plants received during the year are: ferns from Oahu donated by Mr. A. F. Judd; Abutilon from Oahu collected by Otto H. Swezey; ferns from the island of Hawaii collected by Mr. Gerrit P. Wilder; and a portion of a petrified tree from Kauai donated by Mrs. V. Knudsen. From members of the Bayard Dominick Expedition collections of unidentified plants from New Zealand, Tonga, and Samoa have been received. Professor C. J. F. Skottsberg of Upsala has donated a valuable series of vascular plants collected by him in Juan Fernandez Islands.

SHELLS

C. Montague Cooke, Jr., Malacologist, reports accessions as follows:

"From members of the Bayard Dominick Expedition two new lots of shells have been received. The collection made by Mrs. Delila S. Gifford in Samoa, Tonga, Tokelau, and Ellice islands comprises over 2300 marine, fresh-water and land shells; from the Marquesas were received approximately 329 shells mostly land varieties including some minute material.

"In Hawaii during the summer and fall I undertook some collecting of minute marine shells. The method followed was (1) making a survey of part of the windward coast of Oahu by taking samples of sand at several different points along the shore; (2) examining the samples at the laboratory to ascertain the amount of shells present; (3) returning to the richest deposits for larger supplies of material. When sorted from the sand the shells were sent to the Academy of Natural Sciences of Philadelphia for identification. As the field of Hawaiian marine minutiae has not been overworked it is likely that new material will be found in the collection.

"Marie C. Neal, Assistant Malacologist, in company with Olga Smith, Miriam and Ella Barton, and Emma Davis, collected on Kauai a few hundred land shells, among which are some new species of much interest, as some of the material came from entirely new localities.

"The American Museum, in return for naming their collection of Hawaiian shells, offered to the Bishop Museum a selection of any duplicate material that was wanted. By this means the Bishop Museum has acquired from the Gulick, Haines, and Crooke collections rare specimens that were much needed toward the completion of the series of some of our endemic genera. The American Museum has also offered duplicates in the Coan collection of Achatinellidae which has recently come to them.

"From Henry E. Crampton were received over 300 land shells collected in 1920 and also a duplicate set of Tahitian Partulas. (See p. 210.)

"During the year negotiations were completed for the purchase of the W. D. Wilder collection of Hawaiian land shells. The collection contains excellent specimens in large series of some of the species of our Achatinellas.

"The collection of shells of the Museum has also been increased by specimens from Mr. Albert F. Judd, and Albert F. Judd, Jr., (Oahu), Mr. W. H. Meinecke (Oahu and Hawaii), Herbert E. Gregory (Maui and Hawaii), Edwin H. Bryan, Jr. (Oahu), Mr. Bruce Cartwright (Kauai), Kenneth P. Emory (Lanai), Mr. J. S. Emerson, Mrs. Charles Lucas, Mrs. Lahilahi Webb, Mr. J. L. Young and Miss L. Denne. The Albert F. Judd collection and the J. T. Gulick collection have been deposited in the Museum on loan.

"Shells were catalogued during the year as follows:

DONOR	LOCALITY	HOW RECEIVED	NUMBER OF SPECIMENS	CATALOG NUMBERS
Mrs. A. E. Moss	New Zealand	Purchase	8,862	359
Albert F. Judd	Oahu, Hawaii	Gift	108	32
American Museum	Hawaii	Gift for naming	85	49
Marie C. Neal	Kauai, Hawaii	Collected	917	154
Miscellaneous	Hawaii		31	11
			10,003	605

"A series of duplicate Hawaiian land shells, amounting to 203 specimens, was given to the American Museum to fill in gaps in their collection. Besides the marine minutiae (uncataloged) mentioned above, and unidentified specimens from the Bryan collection (cataloged and uncataloged) sent to Philadelphia for naming, duplicates of the Bryan collection (cataloged) of Hawaiian marine shells were sent to Washington for use by Dr. Dall in the preparation of a report on the Hawaiian marine mollusca."

During Mr. Cooke's absence the Museum has also received as gifts: from Mrs. Anthony Richley, 15 unidentified shells, and from Mr. Spencer Bickerton, rock containing fossil nautiloids from Australia.

ZOOLOGICAL MATERIAL

In connection with studies of marine fauna made during the year by C. H. Edmondson, the zoological collections have been considerably increased.

Of Crustacea more than 3,500 specimens were obtained on the island of Oahu at Kaneohe Bay, Kahana Bay, Kawela Bay, Waialae, Kawailoa, Pearl Harbor, Waikiki, and Kahala. The new and rare forms and representatives from new localities have been cataloged; the more common specimens and duplicates have been set aside for exchange. A representative series of Australian Crustacea has been received from the Australian Museum, Sydney, and 46 species of Hawaiian Crustacea were forwarded in return. A few specimens of Crustacea from Maleakahana, Oahu, have been received from C. Montague Cooke, Jr.

About 400 specimens of marine worms taken from the sand, coral blocks, and seaweed at Waikiki, Kawailoa, and Kahana Bay, Oahu, and approximately 150 specimens of echinoderms including sea urchins, serpent stars, and holothurians from Waikiki, Pearl Harbor, and Kawailoa have been added to the collection.

Some good examples of the Portuguese man-of-war (*Physalia arethusa*) were secured at Hauula, Oahu, and an undetermined species of Plumularian hydroid was taken from dead coral on Waikiki reef. The Plumularian is probably the first hydroid found growing in shallow water on the reefs about these islands. Two species of Bryozoa and a number of specimens of compound ascidians obtained at Pearl Harbor have been placed in the Museum.

Representatives of two species of Enteropneusta, one or both of which may prove to be new to science, were taken at Waikiki and Kahana Bay, Oahu, and two species of Enteropneusta, one from Funafuti, the other from Australian waters, have been received from the Australian Museum.

Of Hawaiian lizards ten specimens of *Lepidodactylus lugubris* (D. & B.) were taken at Kawailoa and one in Honolulu.

From other sources the following donations to the zoological collections have been received:

Aloha Temple of the Mystic Shrine, mounted king crab (*Kaempferia kaempferi*) from Japan; J. F. Illingworth, a collection made by Mr. Illingworth near Cairns, Queensland. It consists of 4 skulls and 20 embryos of the kangaroo (*Macropus agilis*), 9 lizards, 2 terrestrial leeches, skull and embryo of a bat (*Pteropus conspicillatus*), 2 skulls and 1 skin of northern bandicoot (*Perameles macrura*), and one opossum skull; David Starr

Jordan, 4 fish secured after the Alika flow of Mauna Loa in 1914 which entered the sea at South Kona, Hawaii, and a slab from California containing fossil herring [*Xyne grex* (J. & G.)]; Mrs. Anthony Richley, 9 corals and 2 alcyonarians; Mr. N. G. Smith, tailless fish (*Polydactylus sextilis*) caught off Koko Head, Oahu; Mr. J. W. Thompson, puffer-fish (Lagocephalus) from the Honolulu market; Mr. J. M. Westgate, a quantity of cephalopod eggs collected June 12 about 4 miles from Diamond Head, Oahu; Mr. M. Yamamoto, moth fish caught off Kakaako, Oahu.

There have been deposited in the Museum by Mr. Albert F. Judd, a set of mounted heads and horns of wild goat, deer, and sheep collected in Hawaii, and by Mr. S. M. Damon, shark jaws and fragments of coral.

MISCELLANEOUS MATERIAL

To the collection of miscellaneous specimens gifts have been made as follows:

Aloha Temple of the Mystic Shrine, Honolulu, German war helmet; Mrs. Anthony Richley, rhyolite vessel and collections of minerals from Arizona; Society for Preservation of New England Antiquities, through Mr. W. S. Appleton, Secretary, oil painting of Paki's home; Mr. William Wagener, 3 rock fragments containing olivine crystals.

NOTES ON COLLECTIONS

In addition to the collections in the exhibition halls a large amount of material in storage is available for study. Rooms in the laboratory are utilized for collections in anthropology, ornithology, malacology, entomology, zoology, and botany. The basement of Polynesian Hall and drawers in Hawaiian Hall accommodate the study and storage collections of ethnology.

Miscellaneous collections of the Museum including relics and unique material of historical interest have been classified and precautions taken for their preservation. The unusually fine T. G. Thrum collection of Hawaiian postage stamps, envelopes, postcards, and revenue stamps has been placed in a fireproof vault and provision has been made for the protection of the Bernice Pauahi Bishop jewelry, which has recently been examined and labeled by a committee consisting of Mrs. C. P. Iaukea, Mrs. Minnie Aldrich, Miss Jennie Parke, Miss Lucy K. Peabody, Mrs. Lahilahi Webb, and Mr. Albert F. Judd.

The collection of ethnological material purchased from J. L. Young, mentioned in the Director's Report for 1920, contains a large number of valuable and interesting artifacts. The Marquesas are well represented. Mention may be made of stone food pounders, ornaments of human hair and porpoise teeth, a fine old stone image, a tapa beater of unusual length, carved coconut cups and wooden bowls, a covered treasure box fashioned crudely in the form of a bird, a portion of a carved stone bowl, a staff of orange wood once used by Chief Moanatini and several carved paddles and war clubs.

The collection from Rapanui (Easter Island) is particularly valuable, containing a fine series of stone adzes, axes and chisels, fish-hooks of various materials among which several of stone are noteworthy, wooden

tablets, stone and wooden images of men and animals, carved clubs and staves representing families, and implements of obsidian.

A series of tapas from the Marquesas, the Tuamotus, Fiji, and Samoa; 2 old wooden four-legged seats and 5 wooden drums from the Tuamotus; a girdle of black shell rings on a fiber band from the Carolines; 3 women's skirts of hibiscus fiber from Cook Islands, and a shell missile with line for catching the Portuguese man-of-war. Birds from Gilbert Islands merit record here. Other islands represented are: Tahiti, Rapa, New Britain, New Guinea, New Caledonia, New Hebrides, Penrhyn, Pitcairn, Tonga, and Hawaii.

Particularly interesting and valuable is the large collection of Hawaiian ethnological material lent by Mr. S. M. Damon. It is rich in stone implements many of which are rare and uncommon. Several of the calabashes differ from any previously received. Fishing implements and tools for making tapa are well represented in this collection.

A study of the exhibit in Hawaiian Vestibule arranged from the large collection of insects made near Cairns, Queensland, and brought to the Museum by J. F. Illingworth gives an idea of its interest. Its range, however, can only be understood when the many thousands being cared for in the entomological rooms are seen. Embryos of kangaroos and skulls of representative Australian mammals are important additions to the Museum stock of such material.

The large and varied collection of ethnological specimens made by Ralph Linton during 1920 and 1921 is evidence of the success of the Bayard Dominick Expedition to the Marquesas Islands. Supplemented by the R. L. Young Collection, it makes the Bishop Museum's material from this region unusually complete.

The contribution of a representative duplicate collection of North American insects donated by Yale University gives the Museum a valuable group for comparison. Another noteworthy accession is the collection of about 1500 mounted Samoan insects the gift of Mr. W. M. Giffard.

During his short period of active duty in January and February, J. W. Thompson made for the Museum four models of human heads, cast of a guava, and a cast of a small shark that may prove to be new to science. While on leave of absence, Mr. Thompson made an excellent cast of a puffer-fish (Lagocephalus), which he presented with the preserved specimen.

As shown by the inventory compiled during the year the Museum collections may be summarized as follows:

Anthropology		
Cataloged	350	
Not cataloged, approximate	25	375
Ethnology including relics)		
Cataloged	15,128	
Not cataloged, approximate	200	15,328
Botany, approximate		53,000
Entmology, approximate		100,000
Geology		
Cataloged	160	
Not cataloged, approximate	50	210

Malacology		
Cataloged, approximate	500,000	
Wilder Collection, approximate	47,000	
Garret Collection	8,530	
Unsorted fossil land shells, approximate	300,000	
Uncataloged land shells, approximate	500	856,030
Ornithology		
Cataloged	4,755	
Not cataloged, approximate	50	4,805
Zoology		
Porifera, approximate	75	
Coelenterata, approximate	600	
Echinodermata, approximtae	300	
Coelhelminthes, approximate	400	
Crustacea, approximate	5,000	
Other invertebrates, approximate	50	
Pisces	3,375	
Reptilia	100	
Mammalia	117	10,017
Models of zoological, botanical and ethnological specimens		1,074
Loans, chiefly ethnological specimens		1,081
Total		1,041,920

EXHIBITION HALLS

During the year a study has been made of the material on exhibition with a view to a regrouping designed to give to the exhibits a larger educational value. A beginning has been made in arranging materials to obviate the confusion of crowded cases and in providing explanatory labels.

Fifty-four plaster of Paris head casts of living Hawaiians, Americans, Japanese, Chinese, Portuguese, Koreans, and Filipinos, and of various crosses between these races were made during 1920 and 1921 by Gordon Usborne and J. W. Thompson, under the direction of L. R. Sullivan. These together with a full figure cast of David Kahanamoku were exhibited in Hawaiian Vestibule and Hawaiian Hall for a few days in July. Later these casts were sent as an exhibit to the International Eugenics Congress. (See p. 191.) A duplicate of the Kahanamoku cast stands temporarily in Hawaiian Hall.

In December an unusually interesting exhibition of economically important insects from Australia was placed in Hawaiian Vestibule. J. F. Illingworth, now of the Museum staff, collected them and with the assistance of Edwin H. Bryan, Jr., arranged them in the cases. Appropriate labels explain their relation to agriculture.

An interesting collection of Hawaiian ethnological specimens lent by Mr. Edgar Henriques has been arranged in Case 111 in the second gallery of Hawaiian Hall opposite one containing an earlier loan.

At the time of the Educational Conference in August the feather capes were specially exhibited. Members of the Pan-Pacific Press Congress visited the Museum in a body on Sunday afternoon, October 23. In preparation for this occasion a number of the feather cloaks were temporarily placed in the wall cases of Hawaiian Vestibule. Members of the staff aided Mrs. Webb in explaining matters of interest.

EXTRACTS FROM REPORTS BY MEMBERS OF THE STAFF

Archaeology—the Marquesas

Ralph Linton, Research Associate in Archaeology, summarizes the results of his work as follows:

There are no indications of any pre-Polynesian population in the Marquesas, and the large stone structures and stone figures which occur there are unquestionably the work of the ancestors of the present natives. Dry stone masonry was highly developed and many of the *tohua* (assembly places) and *me'ae* (sacred places) are remarkable both for their extent and the size of the material employed. All the structures appear to have been either platforms or foundations for houses of perishable material, and there are no indications of vaults or, with one exception, of passages. Cut stone in the form of large rectangular slabs was used to some extent in all the islands, but is most important in Nukuhiva, the stone work showing a gradual decrease in excellence as one goes southward. Stone figures are present in most of the islands but are finest and most numerous in the island of Hivaoa. They appear to be copies of wooden prototypes. The use of stone figures as architectural decorations is well developed.

A great number of ancient sites were visited and studied, the data obtained being incorporated into an archaeological survey. In the northern division the assembly places are large and are not, as a rule, associated with *me'ae,* which are small and of simple construction, evidently modeled on the platforms used for dwelling houses. In the southern division assembly places are always associated with *me'ae,* many of which are of great size and complicated plan.

There appears to be a complete lack of stratified deposits in the group, and it is improbable that excavations of the larger sites would yield results commensurate with the labor and expense involved, and excavations would seriously prejudice the natives against future investigators.

The material culture of the group has suffered greatly from European contact, but details of most of the manufactures can still be obtained from old informants. This, combined with study of the actual objects, has made possible a fairly complete report. The culture shows an unusually high development of wood carving and stone working, coupled with a poor development of mat weaving and tapa making. The latter is especially interesting, as certain primitive implements are employed here that are rare or lacking in other parts of Polynesia. The culture as a whole appears to be most closely related to that of the Maori, the resemblance being strongest in the canoe forms and in the art. In view of the lack of data from other parts of Polynesia it is dangerous to theorize, but it seems probable that the Marquesan and Maori material culture were derived from a single ancestral type which was subsequently modified both in the Marquesas and in New Zealand. The differences at the beginning of the historic period were probably due to (a) the environment of the two peoples, which was tropical and oceanic for the Marquesans and temperate and almost continental for New Zealand; (b) the addition of new cultural elements,

coming mainly from Melanesia in the case of the Maori, and from other parts of Polynesia, notably the Society Islands, in the case of the Marquesans.

Ethnology—the Marquesas

Edward S. Handy, Ethnologist, has submitted the following report on the results of field work in the Marquesas during 1920 and 1921:

A series of physical measurements of 200 natives was taken with Mrs. Handy's assistance. With the observations and measurements are front and side-view photographs of each individual, and hair samples.

The ethnology of the islands was studied with the point of view not of specializing in particular phases of the local culture but of obtaining as nearly as is possible today a complete general picture of the ancient culture. The results of the work are far more satisfactory than I had thought possible before arriving in the islands. The ancient culture of the Marquesas islanders ceased to exist many years ago, but the memories of old people are tenacious and in most cases accurate. Ethnological notes brought home include a number of genealogies; some 60 chants in text, including two most interesting creation chants; about 2500 names of valleys, tribes, sacred places and deities; 34 legends and myths of which 13 are native versions in text; information regarding tribal distribution, alliance, and warfare and so on within the islands; fairly detailed descriptions of industries and organized labor, feasts and festivals; and satisfactory information regarding the religious activities and beliefs, sociology, amusements, and other matters. The organized industries, such as planting and harvesting, canoe and house building, and fishing, were found to be an exceedingly interesting field of investigation. Each type of enterprise or work has its special rules, taboos, processionals, and rites. Another most productive field of study was that of feasts and festivals. Each kind of *koina* (feast) had its special purpose, its particular order, tabus, and rites. The social system and government of the Marquesan islanders was on the whole simple, being based on the principle of family and tribal communism. The most interesting feature of the sociology is the system of secondary husbands and secondary wives which constitutes a combination of polygany and polyandry.

In addition to information derived directly from native informants, some very valuable material came to me through the generosity of the Catholic Mission in the form of manuscripts written by early Catholic missionaries.

Mrs. Handy made a very thorough study of the tattooing, which was a high art in the Marquesas, bringing back about 100 plates of accurate drawings of perhaps twice that number of designs, with data regarding their names and meanings. Such a study will be impossible a few years hence. Mrs. Handy also investigated the native cooking, recorded the processes of making more than 30 string figures, and made pen and ink drawings of most of the objects of material culture used by the Marquesan islanders.

It was brought home to me in working with the lnaguage that the orthography adopted in the grammar and dictionary of Mgr. I. R. Dordillon, commonly in use, is totally inadequate for indicating the phonetics of the language, which differ very markedly from those of the dialects of Hawaii and of Tahiti. A careful though incomplete study of the phonetics and vocalization of the dialect of the Marquesas was therefore made, which it is hoped will be suggestive to linguists.

Briefly, the results of the ethnological survey in their bearing on the ethnographic problem, in so far as definite conclusions may be stated at present, may be summarized as follows: The culture of the Marquesan islanders was basically and essentially Polynesian. There are, however, marked differences from what is usually considered the typical Polynesian complex; certain institutions are entirely or almost entirely lacking—for example, the great sacredness of the chief, and a complicated social order. On the other hand, elements are present for which we find no certain correspondence elsewhere—for example, the tattooing and carving arts. The discovery of the causes or sources of these differences furnishes an interesting problem for the ethnographist, one which will probably not be finally solved until more thorough information regarding the other regions of Oceania is available. My impression at the present writing is that in the first place the Marquesas were little influenced by some late cultural infusion that came into the more westerly groups and overlay an earlier culture; and that, on the other hand, there are strongly present in the Marquesas cultural elements which are not truly Polynesian the sources of which must be sought beyond the western limits of this culture area.

Ethnology—Rurutu and Rapa

A letter from John F. G. Stokes, dated April 15, 1921, includes the following paragraphs:

The natives of Rurutu, numbering about 1300, are concentrated into three villages. Fear of the *muti* (praying to death) greatly interfered with physical measurements but after friendly relations had been established the work proceeded satisfactorily.

The old temple sites were examined; a series of photographs of houses was made showing the transition from the ancient form to the present mortared or frame-walled structure; and moving picture films showing the process of making leaf shingles were made. Moving pictures of food preparations were taken, showing fire making with plough, oven preparation, poi pounding, coconut grating, the method of climbing the coconut palm, and two methods of breaking coconuts.

The agricultural methods have probably changed little; fishing, on the other hand, is only a partial survival of the old methods.

No tapa has been made in Rurutu for years except one piece made recently by a woman who devoted six weeks to the task. I was particularly pleased to witness the process of the work as I learned much that I had not understood before.

Games have been practically abandoned. Many of the young people knew of the string figures of which I obtained a list of 24 that were known and photographs of 12.

The genealogy of the chiefs was secured. It connects the islands of Raivavai, Tubuai, and Rurutu. These genealogies are known only to a few men and are carefully guarded on account of their value in proving land titles.

Only a few fragments of folklore were obtained, for the people look with greatest contempt on the *Etene* (Satan or heathen) period. Particulars of ancient birth customs and circumcision were learned, and of the superstitions that still survive. About 15 *himene* (songs) have been recorded on the phonograph.

Rapa appears to be the most interesting of all the islands visited. It reminds one of a crater sunk into the ocean and the sea filling the bowl. The people, numbering about 300, are concentrated in one village. The so-called forts show up very clearly on the highest points of the ridges. They appear to be places of refuges rather than forts and from the sea they look like Maori *pa*.

Fine wicker baskets of Freycinetia and tapa are still made at Rapa. Stone specimens, adzes, and poi pounders were so numerous at the time of my visit that it was evident that the island had not been previously ransacked as reported.

Archaeology and Ethnology—Tonga

In a brief report by E. W. Gifford concerning his work and that of W. C. McKern, the following is included:

During the nine months spent in active work in the kingdom of Tonga, Mr. McKern and I divided the field, he taking in hand the archaeology, arts and industries of Tonga, while I handled religion and society. Frequent conferences made this scheme of work an ideal one. Each had the benefit of the other's results and no part of the field was overlooked. The work of getting anthropometric data was carried on jointly and with Mrs. Gifford's aid.

The Tongan Government gave us every aid in the work and cheerfully granted all requests and we had the whole-hearted cooperation of Colonel R. W. Tate, Administrator of Western Samoa, and of the Wesleyan Methodist and Roman Catholic churches in Tonga. Thirty-seven Tongan specimens were donated to the Museum by various residents of the Kingdom.

Perhaps the most interesting results of the expedition are those obtained by Mr. McKern, who carried on excavations at ten sites. His most startling find was that of pottery, which is not made by the Tongans of today.

Other exceptionally fine bodies of material are a 270-page genealogy of the royal and chiefly families of Tonga, a fine series of myths and tales, a large collection of medical formulas, and an exceptionally full register of Tongan place names and personal names (more than 4,000 of each), which should be of great value in settling the question of Polynesian origins. These are the richest materials gathered—the high lights that stand out from the whole mass of material covering the entire range of Tongan anthropology. No attempt was made to specialize. We tried faithfully to make a complete reconnaissance of Tongan culture as instructed.

Botany—the Marquesas

Letters from Forest B. H. Brown, Botanist, include the following interesting paragraphs relating to his work and that of Elizabeth Wuist Brown, Research Associate in Botany:

In New Zealand and Tahiti we obtained collections and data of the greatest value bearing upon the native food, ceremonial, medicinal and clothing plants, and have about 1000 Maori and 1000 Tahitian botanical terms—a list to which we are continually adding. The breadfruits have proved of unexpected interest, the native having cultivated this plant for sufficient time and with care so that numerous varieties have been obtained by him which we find admit of clear scientific description.

Our trip through the Tuamotu group was of very unexpected interest. We visited 11 islands, obtained good full plant collections and photographs from Niau, Rangiroa, Arutua, Apataki, Toau, Anaa, Katiu, Taenga, Fangataufa, Fakaiana, and Pukapuka. The stop at Pukapuka was very unusual, extremely few people having seen this island, and we made the best of this exceptional opportunity. For a geologist, it seems this group would be of great interest, for the evidence seems to indicate a recent rapid uplift of these islands. We found a number of plants which probably date back to a period when the surface was mountainous and cloud-capped.

At Tahiti and neighboring islands we left many people searching for bread-fruits. They are greatly interested and certain to locate numerous other varieties, which can quickly be found and described on our return. The natives of the Marquesas and Tahiti actually discriminate between these numerous varieties of bread-fruit with considerably greater accuracy than can the average American agricultural college graduate with varieties of apples and cereals. I should not be surprised if my final list includes 100 varieties!

We have met M. Henry, who described the new Marquesan palm. We find the closest relative of the palm occurs in Central America and is a very close relative to the coconut—a most important bit of evidence. M. Henry has given to the Museum his original photograph of this palm and the negative.

The results of our work are most encouraging. It is probable that our enumeration of the plants of Nukuhiva alone—each with complete herbarium material—will exceed the total number hitherto reported for all French Polynesia; and the natives appear to have known and had some particular use for nearly, if not quite every one.

Entomology

From the report of Otto H. Swezey, Consulting Entomologist, the following has been taken:

The accumulation of Hawaiian insects collected from 1916 to 1921 comprises 16,602 specimens. Only about 3,000 specimens of this large lot of material have been determined. It has been sorted into orders and

smaller groups, and awaits the opportunity of being finally determined at the convenience of those qualified to do so. As this large amount of material is greater than the Museum collection of material described in the Fauna Hawaiiensis (13,783 specimens), it is to be expected that when finally worked up, many species will be found that were not previously represented in the Museum cabinets, and no doubt a considerable number of new species will also be found.

We have the rare opportunity of obtaining insect material from Guam. Commander J. C. Thompson of the United States Navy, an enthusiastic student of natural history, has recently gone there on a protracted assignment, and has generously offered to collect for the Museum.

Mr. F. W. Christian, a missionary in the Cook Islands, has also offered to collect insects for the Museum, and has been supplied with collecting material for the purpose.

During the coming year it is hoped that field work may be done on Molokai, Lanai, or in other localities where little or no collecting has been done. Not only is collecting of specimens desired in many regions of the islands, but it is desirable that every opportunity be taken for making observations in the field on the habits and biology of the Hawaiian insects, for there are many species concerning which little is known. One much desired line of research is the study of the insect fauna of the various kinds of trees, both in particular regions and also generally throughout Hawaii. This phase will always be given attention on all field trips.

The completion of the synonymic bibliographic card catalog of Hawaiian insects is expected in 1922, with the hope that from it a bibliographic list of the Hawaiian insects may be printed.

A type register has been obtained and all "types" and "paratypes" in the collections will be entered. The Fauna Hawaiiensis collection of Hawaiian insects is largely composed of "paratypes" and these have heretofore remained unrecorded as such.

Malacology

From the report of C. Montague Cooke, Malacologist, the following has been taken. (See also p. 199.)

The collections of shells made by members of the Bayard Dominick Expedition as an incidental feature of their ethnological work are interesting and probably contain new material. But their meagerness calls attention to the need of more exhaustive conchological investigation in those and other Pacific islands, especially of small and minute land and marine forms (which are little if at all known) with material for anatomical study. Such an investigation is particularly desirable at this time when introduced plants and animals are destroying native life more and more extensively throughout Polynesia. Data about the distribution and relationship of land shells in the different groups of islands would be helpful in solving some geological problems of the former distribution and relationship of land in this region for as time goes on the amount of evidence is decreasing.

An addition was made to the Museum's supply of fossil land-shell material in September, when I discovered at Kahuku, Oahu, in a coral bluff

a pocket of fossil shells. Though not occupying a space of more than a few square feet the material was so rich—about the richest I have ever seen—that many thousand specimens were taken, some of which may be new. The most noteworthy specimens were a few belonging to the genus Planamastra. This is the second record of the finding of this genus in the Koolau Mountains.

Preparatory to cataloging the Wilder Collection, Mr. Irwin Spalding, who had often accompanied Mr. Wilder on collecting trips, assisted me in working out the localities and the rather complicated system of arrangement of the shells. As a result, part of the collection is now ready to be cataloged, particularly the Achatinellidae, but much of the small material needs to be studied before entry in the catalog is possible. The collection contains excellent specimens in large series of some species of Achatinellas, and it is therefore a matter of regret that the collector left little or no record of data relating to localities.

Land Shells From Guam and Saipan

The following excerpt is from a report by Henry E. Crampton, Research Associate in Zoology:

Earlier investigations have been concerned with the Partulae inhabiting the Society Islands, which constitute the present headquarters of the genus. The volume on Tahiti has been published, while subsequent volumes dealing with the other islands of the group are in preparation. In 1920 an opportunity was seized to make a comparative study in the Mariana Islands which lie at the extreme northwestern part of the whole range of the genus. It was expected that this investigation would prove especially fruitful on account of their distance from the generic headquarters, their contrasted ecological features, and the peculiarities of their indigenous species. Such expectations have been fully realized.

Nearly ten thousand individuals of the species of Partula were collected and properly preserved for intensive study. Thus sufficient material is in hand for a satisfactory ecological and taxonomic comparison of forms from the Marianas with the species from the Society Islands, despite the adverse weather conditions and the lack of transportation facilities which rendered it impossible to visit other islands such as Tinian and Rota. Many hundreds of land-snails belonging to other genera were also collected.

The following brief statement gives the general results:

1. The inter-island comparison of Guam and Saipan is based upon the one species that is common to the two areas, namely, *Partula gibba* Fer.

2. *P. gibba and P. radiolata,* Pfeiffer, are abundant in Guam, and their diversities have been investigated as they are displayed by the collections from 39 representative localities. Each species varies from station to station as regards the number and kind and numerical proportions of its color-classes, and is quantitatively treated in the statistical constants of the several standard characters of the shells.

3. A rare and unfigured species, *P. fragilis* Fér., has been found in Guam in sufficient numbers to afford the basis for a complete study. Appar-

ently this is the same species which was found in Guam by Quadras, and named *P. quadrasi* by von Moellendorf.

4. A new species has been discovered in Guam on the remote peak of Mt. Salifan, and on account of its locality it has been named *P. salifana.* The animals are large and well developed; despite the fact that Guam has been a well known collecting ground for a full century, they have never before been found owing to the seclusion of their habitat.

5. The question as to the causative value of the environmental influences, as contrasted with the congenital factors of differentiation, may now be answered more positively than in the case of the Polynesian material. All of the evidence proves that racial diversification in the material under investigation is due to the operation of internal or hereditary factors.

Zoology

The following interesting items in addition to collections (see p. 200) are reported by C. H. Edmondson, Zoologist:

Work is progressing on the large collection of corals in the Museum, taken in previous years in Hawaii, Palmyra, and in various localities in the South Pacific. The scientific names on the labels of many specimens of corals on exhibition in the Museum are now obsolete and the entire lot should be recataloged when the classification of the specimens has been completed.

A list of the Crustacea in the Museum collected by C. M. Cooke, Jr., at Palmyra in 1913 is being prepared for publication.

Research work at the biological laboratory at Waikiki has been progressing satisfactorily during the year. An intensive study of a section of the reef involving the ecology of the animals found within its limits has been undertaken.

Experimental work looking toward the determination of the rate and conditions of growth of coral, mollusks, crustaceans, and other marine animals is in progress. The spawning season of reef organisms is being noted and studies of embryonic and larval phases of as many forms as possible are being made. The food and feeding habits of the animals of the reef are also being studied.

Daily catches of plankton are being taken on the reef by towing between two established points with the purpose in view of determining the variation in the amount of plankton under different conditions of tide, temperature, and sunlight.

Cooperation with a number of specialists has been established by means of which assistance will be rendered in working up certain groups of Hawaiian fauna. Dr. Charles Chilton, of Christchurch, New Zealand, has been giving attention to Hawaiian amphipods, Miss Alice Robertson of Seattle, Washington, has expressed her willingness to classify the Bryozoa sent her from local waters, and Dr. Joseph Cushman, of the Boston Society of Natural History, is interested in the Foraminifera from the shallow waters of Hawaii. Acknowledgment is also due the United States National Museum for assistance in the determination of certain Crustacea from these waters.

In May, 1921, Miss Elsa Kluegel, a graduate student in zoology, completed her work on the food of Hawaiian food fishes. This work was conducted during the preceding nine months at the biological laboratory, the results being recorded in a thesis on file in the library of the University of Hawaii.

Report of the Librarian

The Librarian, Elizabeth B. Higgins has submitted the following report:

Apart from the accessioning and cataloging of books and serials as received, the library work of the year has been almost entirely the classification, rearrangement, and card-making incident to the introduction of the Library of Congress system. In the early part of the year 106 books were bound and missing parts of current serials were sent for. From July to December with several breaks due to illness the work of classifying was carried on by Miss Driver, the Librarian giving to that part of the work only an hour or two a week for advice and consultation on knotty problems. By December, 1921, when Miss Driver's engagement terminated the most of the working part of the library was recataloged.

The accessions of the year are larger than usual as shown by the following table:

	Parts and Volumes	Pamphlets	Photographs	Maps	Manuscripts
Exchange	229	1,137	.....	.....	.....
Purchase	166	68	50	4	.....
Gifts	216	1,026	407	6	13
	611	2,231	457	10	13

The unusually large number of volumes and pamphlets received by exchange is the result of adding 29 institutions to the list of those receiving the publications of the Museum. (See p. 187.) From several of these institutions nearly or quite complete sets of their serial publications to date have been received—for example, 46 volumes and 32 parts of the Proceedings of the Royal Colonial Institute, 149 botanical and zoological publications from the College of Science, Tokyo, and 12 volumes from the Museum of Natural History at Lyons, France. Several long sets, sent through the Smithsonian Institution, arrived too late to be counted as 1921 accessions.

The new exchanges will add to the Museum library about 32 periodicals that will continue to be currently received—an exceedingly valuable acquisition. The demand for foreign scientific serials is steadily increasing as the work of the Museum develops.

For valuable gifts of books, pamphlets, photographs and manuscripts the Museum is indebted to the following:

Mr. Arthur C. Alexander, 1 manuscript; Mr. J. C. Andersen, 3 separates; Mr. W. S. Appleton, 1 manuscript and 1 pamphlet; Arnold Arboretum, 1 pamphlet; Mr. A. L. C. Atkinson, 1 manuscript; Mr. S. A. Baldwin, 27 photographs; Dr. Stanley C. Ball, 5 separates; Mr. Elsdon Best, 3 separates; Mr. Spencer Bickerton, 1 manuscript; W. T. Brigham, 15 pamphlets and 4 colored prints; Mr. J. MacMillan Brown, 6 clippings; Mr. A. O. Burkland, 17 photographs; Canadian Biological Board, 4 pamphlets; Carnegie Institution of Washington, 6 volumes; Carnegie

Institution of Washington Geophysical Laboratory, 10 pamphlets and 8 separates; Dr. Charles Chilton, 1 volume; C. Montague Cooke, Jr., 1 pamphlet; Miss Ethel M. Damon, 1 volume and 1 pamphlet; Detroit Institute of Art, 6 pamphlets; Mr. E. M. Ehrhorn, 89 pamphlets; Mr. J. S. Emerson, 3 clippings; Kenneth P. Emory, 5 pamphlets; Mrs. C. N. Forbes, 227 pamphlets; Mrs. Walter M. Giffard, 1 photograph; Herbert E. Gregory, 294 photographs, 63 volumes and 338 pamphlets; Mr. W. S. Hillebrand, 1 manuscript; Mr. Leroy H. Harvey, 2 separates; J. F. Illingworth, 9 volumes and 44 pamphlets; Dr. T. A. Jaggar, 3 photographs; Japan Imperial Earthquake Investigation Committee, 1 pamphlet; Mr. T. C. Johnston, 1 package of manuscripts; Dr. David Starr Jordan, 1 separate and 6 photographs; Mr. A. F. Judd, 29 volumes, 134 pamphlets and 3 manuscripts; Mr. C. S. Judd, 18 photographs; Kamehameha Manual School, 52 pamphlets; Mrs. John Kerkup, 1 newspaper; Mr. Charles Kofoid, 1 separate; Mr. Charles F. Kraebel, 23 photographs; Library of Congress, 4 pamphlets; Dr. Felix von Luschan, 1 volume and 6 separates; Mr. Donald Macalister, 13 photographs; Mr. Elmer D. Merrill, 2 volumes; Milwaukee Museum, 1 volume; Dr. A. Mouritz, 1 pamphlet; New York Zoological Society, 1 pamphlet; New Zealand Government, 1 volume and 1 separate; Mr. H. S. Palmer, 3 photographs; Pan-Pacific Union, 5 volumes; Mr. R. R. Parker, 1 pamphlet; San Jose Colegio de Senoritas, 1 pamphlet; Mr. E. S. Shepherd, 1 separate; Mr. Will Smithies, 1 manuscript; J. F. G. Stokes, 1 manuscript; Mr. J. Mollerup-Thomsen, 2 pamphlets; L. R. Sullivan, 1 separate; Mr. Lorrin A. Thurston, 1 separate; Thomas G. Thrum, 1 manuscript; Dr. R. J. Tillyard, 64 separates; United States Department of Agriculture, 5 pamphlets and 1 volume; United States Fish Commission, 29 volumes and 22 pamphlets; U. S. Geological Survey, 6 maps; United States Hydrographic Office (through Mr. G. W. Littlehales), 18 volumes and 10 separates; Mr. Edward P. Van Duzee, 1 volume; Miss Elsie Wilcox, 2 photographs; Yale University, 3 volumes.

Special mention should be made of the large collection of books and pamphlets and the very valuable set of photographs of Australia and New Zealand given by Herbert E. Gregory. Large gifts of pamphlets and books have also been made by Mr. A. F. Judd and Mrs. C. N. Forbes. Many valuable authors' separates and pamphlets have also been received, among them 64 papers on Australian insects, the gift of Dr. H. J. Tillyard. From the U. S. Fish Commission and the U. S. Hydrographer's Office a number of bound copies of works relating to the Pacific have been received.

The accessions of photographs by gift have been exceptionally large and a set of manuscript maps of Kau given by United States Geological Survey is particularly valuable from the ethnologist's point of view.

Some advance has been made toward a closer affiliation between the Museum library and the other libraries of the city. A number of volumes and pamphlets on subjects out of the Museum field have been transferred to the University of Hawaii, and books have been lent reciprocally by the University, the Hawaiian Sugar Planters' Association and the Museum. Several volumes have also been lent to the University of California library. A closer correlation of the Honolulu libraries is likely to be possible soon.