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About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

n.d. c 1959
D/C.D

RESEARCH PROPOSAL SUBMITTED TO

THE NATIONAL SCIENCE FOUNDATION

for

Further Botanical Exploration of the Hawaiian Islands

and

Continued Publication of Illustrated Descriptions in the

"Flora Hawaiiensis"

from

Otto Degener

Mokuleia Beach

Oahu, Hawaii

1. Institution: The New York Botanical Garden, Bronx Park, New York 58, N.Y.
2. Principal Investigator: Otto Degener
3. Title of Proposed Research: "Botanical Exploration of the Hawaiian Islands"
4. Desired Starting Date: The research is already under way; support is desired as soon as this proposal can be activated.
5. Time Period for which Support is Requested: Five years
6. Budget Requested: $67,320

Research Proposal Submitted to the National Science Foundation

1. Institution: New York Botanical Garden, Bronx Park, New York 58, N.Y.

2. Principal Investigator: Otto Degener, Collaborator in Hawaiian Botany.

3. Title of Proposed Research: "Further Botanical Exploration of the Hawaiian Islands and Continued Publication of Illustrated Descriptions in the 'Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands.'"

4. Desired Starting Date: The research is already under way; support for it would be gratefully received as soon as this proposal can become activated.

5. Time Period for which Support is Requested: Five years.

6. Description and Background of Proposed Research: Thanks to Grant Number G2216 dated January 1956 and its renewal as Grant Number G6377 dated May 1958, the writer and his wife conducted field work as well as study in herbarium and library. As a result of these efforts, the "Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands" has progressed through Book 5 into Book 6. The total number of published pages in an edition of 3,000 copies available to the public comes to just over 2,000.

The Hawaiian Archipelago is so isolated geographically in the Pacific that of its estimated 20,000 different species, varieties and forms of Flowering Plants, all but a fraction of 1% are endemic. This high degree of endemism is not only limited to the Archipelago as a whole, but many taxa are limited to one isolated mountain summit, some arid ridge surrounded by a lush sea of vegetation, some darkly shaded gulch, or some isolated oasis in a barren waste of aa lava.

The continuous discovery and publication of novelties up to the present time indicate that our knowledge of the Hawaiian flora is still far from complete. Many such novelties are collected even in those areas that are rapidly being despoiled of all vegetation due to the ravages of feral goats, cattle, deer, swine, antelope and mouflon, the competition of weeds and of exotic trees planted by the State Government by 'plane and otherwise in the Forest Reserve, and the spread of agriculture. Such destruction of the native Hawaiian flora is

continuing with ever-increasing fury, and cannot be stopped! Many species collected by early workers, and even by modern ones like myself, are already extinct and known to us only from herbarium specimens. Many more are on the verge of extinction and should be collected and studied before it is too late. We owe to future generations a representative set of herbarium specimens of our unique Hawaiian flora that we, due to commerce, ignorance and vandalism, are rapidly exterminating.

Though the collecting, describing and illustrating of the native flora is of prime importance, the introduced flora must not be neglected. Exotics should be collected as herbarium specimens and preserved as proof of their arrival in the Hawaiian Islands at a certain date. Comparison centuries hence of these pioneers and their descendants in the Islands may give clues as to the rapidity of speciation and other evolutionary problems as yet unformulated.

I acquired my interest in tropical plants in the summer of 1920 in Bermuda as undergraduate assistant of Plant Pathologist Herbert H. Whetzel. Two years later I enrolled as graduate student in the Department of Botany at the University of Hawaii, becoming a diligent collector of the Hawaiian flora. While trying to identify my finds with the available literature, using above all others the only general floristic work extant for the area, Hillebrand's "Flora of the Hawaiian Islands" completed in 1871, I came to realize the incompleteness of man's knowledge of the Islands' rich flora. I resolved then and there to work toward helping correct this deficiency. With this in mind I returned home to New York City and continued the study of my Hawaiian plants under the guidance of Drs. Britton, Rydberg and Barnhart at the New York Botanical Garden. In 1925 I emigrated to the Islands permanently to collect as much of the fast-vanishing flora as possible and to help record it.

Due to limited library and herbarium facilities - truly wretched when I began almost two score years ago - I published relatively little entirely alone but distributed my collections for naming to leading specialists throughout the world.

Almost every monograph dealing with Hawaiian vascular plants published since 1928 has at least cited my collections. Often I have been quoted, and not infrequently these publications contain descriptions of novelties published in collaboration with me. Consequently I have played a role as something more than merely the collector of rare plants.

As early as 1926 I had announced my intention to proceed with the publication of a Flora Hawaiiensis. From 1932 to the present this work has been appearing in loose-leaf fascicles until now the sixth volume is almost complete. Over 2,000 pages have appeared, and the work is profusely illustrated. This large work, while not resting exclusively upon my own collections, has only been possible through the experience I have gained and the specimens I have made as an observant field botanist. In almost 40 years.

Over 200 papers by about 88 authors, principally systematic botanists, have referred to plants collected or notes taken by me. Since my activities as a collector have been eminently successful, as indicated by the extent of the collaboration, I wish to continue them along about the same line. I am also anxious to continue the publication of the "Flora Hawaiiensis" as promptly as manuscript and illustrations can be prepared.

The procedure to be followed is to use a car for making as thorough a coverage as possible by road of the principal islands of the Archipelago within the next five years. Where the car cannot penetrate farther, I shall proceed on foot. Vast areas in the Islands are still botanically unexplored. Due to the extremely "chopped up" nature of the terrain in this volcanic region, much of it is extremely difficult of access. Also, the high degree of endemism in the Islands calls for as complete an exploration of them as possible. It is dangerous to botanize precipitous areas and other types of rough lava alone so that often an assistant collector, besides my wife, should be available.

7. Facilities: Our home on the Island of Oahu is available as our laboratory and study. There we have our collection of books and pamphlets about Hawaiian and

non-Hawaiian plants, our microscope and other study and writing equipment.

We have the use of a Volkswagen ambulance purchased second hand for $1,500 February 1956 with NSF funds. This vehicle is in such a worn out condition after years of field work that any future major repair would be uneconomical. Consequently we believe it must be replaced within a year or two with a similar car possessing high clearance for rutted, mountain roads.

In addition, Mrs. Degener and I, through the kindness of its Director, have the use of the library and herbarium of the Bishop Museum in Honolulu. Here are preserved many of my plant finds, deposited from time to time as gifts.

8. Personnel: The permanent personnel involved would consist of myself and my wife. Being childless both of us intend, as in the past, to give essentially full time to this project. Funds are not requested from the National Science Foundation for salaries. In fact, local experience indicates that the purchase of needed plant drawings from artists at prearranged prices is more economical than having an artist on salary.

OTTO DEGENER

(Principal Investigator)

Born: May 13, 1899, Orange, New Jersey.

Education: Trinity and Collegiate Schools, New York, N.Y.; B.S., Massachusetts Agricultural College (now University of Massachusetts), 1922; M.S., University of Hawaii, 1925; Sc. D. (hon.), University of Massachusetts, 1952. Post graduate work at Woods Hole, Massachusetts, New York Botanical Garden and Columbia University.

Experience: Instructor in Botany, University of Hawaii, 1925-27. Later Naturalist at Hawaii National Park. Botanist on Anne Archbold Expedition to Melanesia, 1940-1941, spending 8 months in Fiji. As a result of botanical exploration the new Ranalian Family Degeneriaceae was named in his honor. Study in European herbaria, 1951-52. Botanical consultant for CAA for Canton Atoll, South Pacific. Collaborator in Hawaiian Botany, New York Botanical Garden, 1935 - 1961.

Books: Illustrated Guide to the More Common or Noteworthy Ferns and Flowering Plants of Hawaii National Park with Descriptions of Ancient Hawaiian Customs and an Introduction to the Geologic History of the Islands. 1-312 pp. 1930. Second edition, 1945.

Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands. Books 1-5 (Book 6 in collaboration with Mrs. Degener over 75% completed.) Over 2,000 pp. 1932-61.

Naturalist's South Pacific Expedition: Fiji. 1-303 pp. 1949.

DR. I. HANSEN DEGENER

(Research Associate)

Actually co-author

Education: Student in the Natural Sciences, Albert-Ludwig University, Freiburg, Baden, 1944; Dr. rer. nat. (Dr. Natural Sciences), magna cum laude, Friedrich-Wilhelm University, Berlin, 1949. Botanical assistant at the Botanisches Museum, Berlin-Dahlem, 1945-46; lecture and laboratory assistant to Drs. R. Pilger and H. Sleumer, Berlin-Dahlem, 1948-49; botanist, ditto, 1949-53; assistant in pharmacognosy at the Freie Universitat, Berlin-Dahlem.

Publications: (as I. Hansen) Europaeische Arten der Gattung Erica L. Bot. Jahrb. 75:1-81. 1950. (With Gerloff,J.) Beitrage zur Kenntnisse einiger Volvocales. Berl. Deutsch. Bot. Gesell. 65 (4): 87-93. 1952. (As I. Degener, with O. Degener), Nutzpflanzen der Eingeborenen von Fidschi. Mitt. Bot. Gart. u mus.Berl.-Dahl. 1:1-20. 1953. (I. Degener, with E. Potztal), Beitrage zur Anatomie und Systematik der Leptureae. Bot. Jahrb. 76:251-270. 1954. Co-author and collaborator in most articles with her husband since her marriage in 1953.

Shorter Articles in Scientific Journals: To date my (since our marriage Dr. Isa Degener is mostly included) collections, my observations, my illustrations or descriptions of interesting finds or of novelties by myself and mostly collaborators are scattered under the accompanying APPENDIX. This is uncritical and incomplete

as I lack access in the Islands to some references. It shows, however, that it has ever been my purpose to speed up our knowledge of the flora of the South Seas. As announced about twenty-five years ago in "An Opportunity to Cooperate in the Study of Hawaiian Plants" (Torreya 33 : 158), my specimens always have been available for study to any qualified specialist anywhere. The following workers, for example, have taken advantage of my offer. Arnold has made use of my cuts to illustrate his book about "Poisonous Plants of Hawaii," Sherff has described many novelties in collaboration with me, Yuncker has described novelties in Cuscuta and Peperomia based on my collections, and Chandler now thanks me in the preface of his book for help. So far as Hawaii and Fiji are mainly concerned, my collections and observations have been of considerable value. I alone have influenced the work of most of the following writers mentioned in the APPENDIX favorably: Mrs. Degener and I, since our marriage.

9. Budget Estimate (5 yrs.)	1961	1962	1963	1964	1965	TOTAL
a. Salaries of Drs. Degener	-	-	-	-	-	-
b. Expendable Equipment & Supplies (pressing equipment, preservatives, photostats, postage & shipping costs, etc.)	700	600	600	600	600	3,100
c. Travel: 1. Drs. Degener & assistants with car from island to island by 'plane & boat	1,800	1,800	1,800	1,800	1,800	9,000
2. Car mileage: 5,000 miles per yr. at 11¢ per mile	550	550	550	550	550	2,750
d. Maintenance in the field of 2-3 persons (meals & lodgings)	1,650	1,650	1,650	1,650	1,650	8,250
e. Publication of "Flora Hawaiiensis"	3,000	3,000	3,000	4,500	4,500	18,000
f. 3,000 book covers, punching, trimming, collating, designing cover, making silk screen	5,000 (book 6)	-	-	-	5,000 (book 7)	10,000
g. Purchase of drawings made to order to illustrate specific species for Flora Hawaiiensis or "New Illustrated Flora of the Hawaiian Islands"	1,000	1,000	1,000	1,000	1,000	5,000
TOTAL DIRECT COSTS	$ 13,700	$8,600	$8,600	$10,100	$15,100	$56,100
Indirect Costs(20%)	2,740	1.720	1,720	2,020	3,020	11,220

TOTAL 67,320

Alexander, C.P. 1943. Undescribed Species of Western Nearctic Tipulidae (Diptera). The Great Basin Nat. 14:89-100.

----------. 1944. New Nearctic Crane-Flies (Tipulidae, Diptera). Can. Ent. 76: 166-172.

Allard, H. A. 1943. The North American Ragweeds and their Occurrence in Other Parts of the World. Science 98:292-295.

Anonymous. 1933. News, Notes, and Comments. Jour. N. Y. Bot. Gard. 34:276.

---------. 1942. Minutes of Meeting Dec. 1, 1942. Torreya 42:199-200. (Abstr. Degener lecture.)

---------. 1947. Beyond the Hawaiian Horizon: Fiji. Paradise Pacific. Feb. 28.

---------. 1949. Stories in Plants. Hawaiian Botanist's Book (Review of Degener, O. Plants Haw. Nat. Park) Pacific Islands Monthly. Sept.

---------. 1950. Hawaiian Motif. Paradise Pacific 62(8):29. (Description of plaque at 34th International Flower Show held at Grand Central Palace, New York City, honoring Degener for the year as "outstanding botanist or naturalist who was a native of the Pacific Islands or did his main work there.")

gymnoxiphium

---------. 1957. Argyroxiphium (Gray) Keck. Gard. Jour. 7:29. 1957.

Arnold, H. L. 1944. Poisonous Plants of Hawaii. 1-71. pl. 1-24.

Baehni, C. 1942. Memoires sur les Sapotaes. II. Le Genre Pouteria. Candollea 9:147-476.

Bailey, I. W. & Smith, A.C. 1942 Degeneriaceae, a New Family of Flowering Plants. Jour. Arn. Arb. 23:356-365.

Bartram, E. B. 1933. Manual of Hawaiian Mosses. Bishop Mus. Bull. 101: 1-275.

----------. 1939. Supplement to the Manual of Hawaiian Mosses. Bishop Mus. Occas. Pap. 15:93-108.

----------. 1944. Additions to the Mosses of Fiji. The Bryol. 47:57-61.

----------. 1952. High Altitude Mosses from Mauna Kea, Island of Hawaii. Bishop Mus. Occas. Pap. 20:297-300.

Carlquist, S. 1957. Leaf Anatomy and Ontogeny in Argyroxiphium and Wilkesia (Compositae). Amer. Jour. Bot. 44:696-705.

----------. 1957. Systematic Anatomy of Hesperomannia. Pac. Sc. 11-207-215.

----------. 1959. Studies on Madinae: Anatomy, Cytology, and Evolutionary Relationships. Aliso 4:171-236.

Caum, E. L. & Hosaka, E.Y. 1936. A New Species of Schiedea, Bishop Mus. Occas. Pap. 11(23): 1-5.

Chandler, W. H. 1958. Evergreen Orchards. 1-535.

Chock, A.K. 1956. A Taxonomic Revision of the Hawaiian Species of the Genus Sophora L. (Family Leguminosae). Pac. Sc. 10:136-158.

Christensen, C. 1930. The Genus Cyrtomium. Amer. Fern Jour. 20:11-52

Christophersen, E. 1934. A New Hawaiian Abutilon. Bishop Mus. Occas. Pap. 10(15):1-7.

Clausen, R.T. 1938. A Monograph of Ophioglossaceae. Mem. Torr. Bot. Cl. 19:1-177.

----------. 1954. Ophioglossaceae of the Hawaiian Islands. Amer. Jour. Bot. 41:493-500.

Croizat, L. 1943. Notes on Polynesian Glochidion and Phyllanthus. Bishop Mus. Occas. Pap. 17:207-214.

----------. 1944. Notes on Fijian Euphorbiaceae. Bishop Mus. Occas. Pap. 18:69-71.

Cummins, G.B. 1937. Description of tropical rusts. Torr. Bot. Cl. Bull. 64:39-44.

Danser, B.H. 1937. A Revision of the Genus Korthalsella. Jard. Bot. Buiten. Bull. III. 14:115-159.

Degener, O. 1924. Four New Stations of Lycopodium Prothallia. Bot. Gaz. 77:89-94.

----------. 1925. The Gametophyte of Lycopodium Cernuum in Hawaii. Bot. Gaz. 80:26-46.

----------. 1925. Dardanus sanguinocarpus, new species; in Edmondson, C.H. Marine Zoology of Tropical Pacific Crustacea. Bishop Mus. Bull. 27:4, 24.

----------. 1926. Preliminary Pages to a Flora Hawaiiensis or Illustrated Flora of the Hawaiian Islands. 1-102. (Mimeographed).

----------. 1929. The Genus Bidens (Campylotheca) in Hawaii. Bishop Mus. Spec. Publ. 15:6-7.

----------. 1930. Illustrated Guide to the More Common or Noteworthy Ferns and Flowering Plants of Hawaii National Park with Descriptions of Ancient Hawaiian Customs and an Introduction to the Geologic History of the Islands. 1-312.

----------. 1932. A New Illustrated Flora. Bishop Mus. Spec. Publ. 20:9-10.

----------. 1932. Kookolau, the Hawaiian Tea. Jour. Pan-Pacif. Res. Inst. 7(2):2-16.

----------. 1932. The Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands. Jour. Pan-Pacif. Res. Inst. 7(4):2-16.

Degener, O. 1932-1961. Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands. Books 1 - 4 printed in 1946 in second edition due to destruction of many copies of first edition during April 1, 1946 tidal wave. Book 6, in collaboration with Dr. Isa Degener, now almost completed). Over 2,000 pages, profusely illustrated.

----------. 1933. Hawaiian Mosses. Torreya 33:151.

----------. 1935. An opportunity to Cooperate in the Study of Hawaiian Plants: Torreya 33:158.

----------. 1936. Pages from a New Illustrated Flora of the Hawaiian Islands. Bishop Mus. Spec. Publ. 30:26.

----------. 1937. Videant Consules. Rev. S. Am. Bot. (Montevideo) 6:38-41.

Degener, O. & Skottsberg, C. 1937. A New Hawaiian Species of Rutaceae. Brittonia 2:362.

Degener, O. 1938. Chaulmoogra Oil History is Traced by Hawaiian Scientist in this Review. Hon. Star-Bull. (Newspaper) Dec. 17.

Degener, O. & Hosaka, E.Y. 1938. A New Species of Phyllostegia and Two New Varieties of Cyanea of the Hawaiian Islands. Bishop Mus. Occas. Pap. 14:27-30.

----------. 1940. Straussia Sessilis, a New Species from Hawaii. Bull. Torr. Bot. Cl. 67:301.

Degener, O. 1942. Botanizing in Fiji. Torreya 46(6):199-200.

----------. 1943. Stenogyne Sherffii Degener, a New Mint from Hawaii. Brittonia 5:58-59.

----------. 1943. The Last Cruise of the "Cheng Ho." Jour. N.Y. Bot. Gard. 4:197-213, 221-232.

----------. 1944. The Last Cruise of the "Cheng Ho." Alumni Bull. State College 26(8):6-7, 10, 12.

----------. 1945. A Botanist Leaves Hawaii. Torreya 45:72-78.

----------. 1945. Tropical Plants the World Around (I). Jour. N.Y.Bot. Gard. 46:76-91; (II) 110-125; (III) 132-143; (IV) 158-167.

----------. 1945. Notes from New Guinea. Jour. N.Y. Bot. Gard. 46(552): 292-293.

----------. 1945. Plants of Hawaii National Park Illustrative of Plants and Customs of the South Seas. 1-314. (Practically a second edition of book printed in 1930.)

----------. 1946. Plants for Pacific Islands. Jour. N.Y. Bot. Gard. 47(562):260.

----------. 1946. Plant Explorer in Fiji. Through the Garden Gate (N.Y.B.G.) 1(4): (2 pages).

Degener, O. 1946. The Tritonia Becomes Naturalized. Organic Gard. 8(5):42.

----------. 1947. Hawaii's Native Flowers. Paradise Pacific. Hawaiiana 69(6):15.

----------. 1948. Silversword. Haw. Digest 3(15):23-27.

----------. 1948. A Note on the Early Life of Robert S. Williams. Jour. N. Y. Bot. Gard. 49(577):16-17.

----------. 1949. Naturalist's South Pacific Expedition: Fiji. 1-303.

----------. 1951. Potter's Noni. Proc. Fla. State Hort. Soc. 231-232.

Degener, O. & Hawkes, A.D. 1951. The Holly Fern. Am. Fern. Jour. 41:117-120.

Degener, O. & Greenwell, A.B.H. 1951. A New Variety of Perrottetia (Celastraceae) from the Hawaiian Islands. Rev. S. Am. Bot. (Montevideo) 10(1):25.

Degener, O. & Hathaway, W. 1951. (1952?) Die Flora des Cantonatolls im Stillen Ozean. Rev. S. Am. Bot. (Montevideo) 10:33-37.

Degener, O. & Fosberg, F.R. 1952. A Central Pacific Sesuvium. Bishop Mus. Occas. Pap. 21:45-47.

Degener, O. & I. 1953. Nutzpflanzen der Eingeborenen von Fidschi. Mitt. Bot. Gart. u. Museum Berl.-Dahl. 1:1-20.

Degener, O. 1954. The Capers of Commerce. Saier's Gard. Mag. 3:363.

----------. 1955. Hawaii - Nature's Botanic Garden. Hort. 33(3):134-135.

Degener, O. & Gillaspy, E. 1955. Canton Island, South Pacific, Atoll Res. Bull. 41:1-51.

Degener, O. & I. 1956. Impressions of Yugoslavia. Gard. Jour. (N.Y.B.G.) 6:23-24.

Degener, O. & I. & Ziegenspeck, H. 1956. Vorkommen von Drosera anglica Huds, in Hawaii und die Samenverbreitung mancher Drosera Arten in Hawaii und Europa. 1-6.

Degener, O. 1957. Wilhelm Hillebrand (1821-1886). The Asa Gray Bull. 3:193-198.

Degener, O. & I. 1958. The Hawaiian Beach Scaevola. Phytologia 6:321.

Degener, O. & Ziegenspeck, H. 1959. Bearbeitung der Sporangien der lepto-sporangiaten Farne (Filicales) mit neueren Methoden. 1-12.

Degener, O. 1959. Book Review (Kuck & Tongg, Haw. Flowers & Flowering Trees). Phytologia 6:444.

----------. 1959. Hawaiian Flowers and Flowering Trees. Gard. Jour. (N.Y.B.G.) 9(1):33.

Egler, F. E. 1937. A New Species of Hawaiian Portulaca. Bishop Mus. Occas. Pap. 13(15):167-170.

----------. 1939. Santalum ellipticum, Restatement of Gaudichaud's Species. Bish. Mus. Occas. Pap. 14:349-357.

----------. 1947. Arid Southeast Oahu Vegetation, Hawaii. Ecol. Monogr. 17:383-435.

----------. 1949. Portrait of Fiji and of a Personality. (Review of Degener, O. Naturalist's South Pacific Expedition:Fiji) Jour. N.Y. Bot. Gard. 50:262.

Emory, K. P. 1946. Hawaiian Tattooing. Bishop Mus. Occas. Pap. 18:235-268.

Fagerlund, G. O. & Mitchell, A.L. 1944. Checklist of Plants, Hawaii National Park, Haw. Nat. Park Hist. Bull. 9:1-76.

Fosberg, F. R. 1936. Miscellaneous Hawaiian Plant Notes - I. Bishop Mus. Occas. Pap. 12(15):1-11.

----------. 1936. The Hawaiian Geraniums. Bishop Mus. Occas. Pap. 12(16)1-19.

----------. 1937. The Genus Gouldia (Rubiaceae). Bishop Mus. Bull. 147:1-82.

----------. 1939. Notes on Polynesian Grasses. Bishop Mus. Occas. Pap. 15:37-48.

----------. 1939. Taxonomy of the Hawaiian Genus Broussaisia (Saxifragaceae). Bishop Mus. Occas. Pap. 15:49-60.

----------. 1939. Diospyros ferrea (Ebenaceae) in Hawaii. Bishop Mus. Occas. Pap. 15:119-131.

----------. 1942. Miscellaneous Notes on Hawaiian Plants - 2. Bishop Mus. Occas. Pap. 16:337-347.

----------. 1943. Notes on Plants of the Pacific Islands. III. Bull. Torr. Bot. Cl. 70:386-397.

----------. 1943. The Polynesian Species of Hedyotis (Rubiaceae). Bishop Mus. Bull. 174. 1-102.

----------. 1948. Immigrant Plants in the Hawaiian Islands. Univ. of Haw. Occas. Pap. 46:1-7.

Hastings, G. T.1941. (Review of Degener, O.) Flora of the Hawaiian Islands. Torreya 41:16-18.

Hatheway, W.H. 1952. Composition of Certain Native Dry Forests: Mokuleia, Oahu, T.H. Ecol. Monogr. 22:153-168.

Hawkes, A.D. 1949. A Botanist in Fiji. (Review of Degener, O., Naturalist's South Pacific Expedition: Fiji.) Paradise Pacific 61(12):106.

Hawkes, A. D. & Degener, O. 1950. The Upright Psilotum. Amer. Fern Jour. 40:207-210.

Hawkes, A. D. & Degener, O. 1950. Notes on Dicranopteris emarginata. Amer. Fern Jour. 40:253-255.

Hayward, W. 1957. The Cultivated Taccas. Baileya 4:85-97.

Hogue, C. E. 1950. Botanists Protest Axis Deer on Hawaii. The Biclog. 33:19-21.

Hosaka, D.H. & Thistle, A. 1954. Noxious Plants of the Hawaiian Ranges. Univ. Haw. Ext. Bull. 62:1-39.

Hubbard, D.H. & Bender, Jr., V. R. 1950. Hawaii Nature Notes. Haw. Nat. Hist. Assn. 4:1-29.

Johnson, L. A. S. 1957. A Review of the Family Oleaceae. Contr. N. S. Wales Nat. Herb. 2:395-418.

Keck, D. D. 1936. The Hawaiian Silverswords, Systematics, Affinities, and Phytogeographic Problems of the Genus Argyroxiphium. Bishop Mus. Occas. Pap. 11:1-38.

Kobuski, C.E.1935. Studies in Theoceae, I. Eurya subgen. Ternstroemiopsis. Jour. Arn. Arb. 16:347-352.

Krauss, R.W.1950. A Taxonomic Revision of the Hawaiian Species of the Genus Carex. Pac. Sc. 4:249-282.

Lam, H. J. & Meeuse, B.J.D.1938. Monograph of the Genus Nesoluma (Sapotaceae). Bishop Mus. Occas. Pap. 14:127-165.

Lam, H. J. 1954. Nesoluma and Planchonella from the Hawaiian Islands (Sapotaceae). Bishop Mus. Occas. Pap. 21:209-212.

Long, W. H. 1947. Studies in the Gasteromycetes XV. Notes on New or Rare Species of Tylostoma. Lloydia 10:115-135.

Lanjouw, J. et al. 1956. Int. Code Botanical Nomenclature Regn. Veg. 8:30.

McLean, F. T.1934. Meeting of December 5, 1933. (Abstr. Degener lecture) Torreya 34:24-25.

Merrill, E.D. 1954. The Botany of Cook's Voyages. 1-384.

Miller, H.A. 1953. Notes on Hawaiian Hepaticae: Frullaniaceae. The Bryologist 56:40-48.

----------. 1954. Field Observations on Associations of Hawaiian Mosses. The Bryologist 57:167-172.

Moldenke, H.N.1945. The Known Geographic Distribution of the Members of the Verbenaceae-----. Am. Jour. Bot. 32:609-612. (Lantana camara var. albiflora n. var. based on Degener's Oahu specimen.)

----------.1958. Materials Toward Monograph Genus Vitex. XI. Phytologia 6:197.

----------.1959. Notes on new and noteworthy plants. Phytologia 7:73-77.

Monachino, J. 1949. Revision of the Genus Alstonia. Pac. Sc. 3:133-182.

Nolan, G. C. 1950. Hillebrandia Sandwicensis. The Begonian 27:123.

Ostergarrd, J.M.1955. Some Opisthobranchiate Mollusca from Hawaii. Pac. Sc. (April) 110:135. (Describing Eysia degeneri sp. nov.)

Petrak, F. 1952. Ein Beitrag zur Pilzflora von Hawai(i). Sydowia, Ann. Myc. Ser. II. 6:363-371. 1952.

---------. 1953. Beitrage zur Pilzflora von Hawaii. Sydowia, Ann. Myc. Ser. II. 7:381-409.

Pope, W. T. 1929. Manual of Wayside Plants of Hawaii. 1-289.

Potztal, E. 1954 (?) Panicum Degeneri. Bot. Jahrb. 76(?) (Not available)

Rock, J. F. 1957. Some New Hawaiian Lobelioids. Bishop Mus. Occas. Pap. 22:35-66.

Ruhle, C. 1959. Hawaii National Park. A Guide for the Haleakala Section, Island of Maui, Hawaii. U. S. Dept. Int. Nat. Park Serv. 1-94.

Santos, J. V. 1950. A Review of the Grass Genus Garnotia. Nat. & Appl. Sc. Bull. 10(1-2):1-179.

Scanlan, G. M. 1942. A Study of the Genus Cyperus in the Hawaiian Islands. Cath. Univ. Amer. Biol. Ser. 41:1-62.

Schmidt, K.P. 1949. Botanical Explorations in the Fijis. (Review of Degener, O., Naturalist's South Pacific Expedition: Fiji) Scientific Monthly 69:344.

Selling, O.H. 1946. Studies in Hawaiian Pollen Statistics. Part I. The Spores of the Hawaiian Pteridophytes. Bishop Mus. Spec. Publ. 37:1-87.

----------. 1947. Studies in Hawaiian Pollen Statistics. Part II. The Pollens of the Hawaiian Phanerogams. Bishop Mus. Spec. Publ. 38:1-430.

----------. 1948. Studies in Hawaiian Pollen Statistics. Part III. Bishop Mus. Spec. Publ. 39:1-154.

Shen, R. H. & Constance, L. 1951. The Genus Sanicula (Umbelliferae) in the Old World and the New. Univ. Calif. Publ. Bot. 25:1-78.

Sherff, E. E. 1928, 1932. Studies in the Genus Bidens. VIII. Bot. Gaz. 85:1-29. 1928; IX. 86:435-447. 1928; X. 93:213-220. 1932.

----------. 1929-1935. New or Otherwise Noteworthy Compositae. III. Bot. Gaz. 88:285-309. 1929; IV. Bot. Gaz. 89:362-373. 1930; VII. Bot. Gaz. 92:202-209. 1931; IX. Bot. Gaz. 95:78-103. 1933; X. Amer. Jour. Bot. 22:705-710. 1935.

----------1931 Review of Degener, O. Illustrated Guide to the -------). Bot. Gaz. 91(4):465.

----------. 1933. New or Otherwise Noteworthy Compositae. VIII. Bot. Gaz. 94:589-597.

----------. 1933. Some New or Otherwise Important Compositae of the Hawaiian Islands. Amer. Jour. Bot. 20:616-619.

----------. 1934. Some New or Otherwise Noteworthy Members of the Families Labiatae and Compositae. Bot. Gaz. 96(1):136-153.

----------. 1935. Revision of Haplostachys, Phyllostegia, and Stenogyne. Bishop Mus. Bull. 136:1-101.

----------. 1936. Additions to the Genus Euphorbia L. and to Certain Genera of the Compositae. Bot. Gaz. 97:580-609.

----------. 1937. The Genus Bidens. Field Mus. Nat. Hist. Bot. Serv. 16:345-709.

----------. 1937. Certain New Plants from Hawaii and Mexico. Amer. Jour. Bot. 24:88-90.

----------. 1938. Revision of the Hawaiian Species of Euphorbia L. Ann. Mo. Bot. Gard. 25:1-94.

----------. 1938. Studies in the Genus Labordia Gaud., with a New Variety of Megalodonta E. L. Greene. Am. Jour. Bot. 25:579-589.

----------. 1939. Genus Labordia, Hawaiian Euphorbiaceae, Labiatae and Compositae. Field Mus. Nat. Hist. Bot. Ser. 17:447-612.

----------. 1940. (Review of Degener, O. Flora Hawaiiensis.) Bot. Gaz. 102:223.

----------. 1941. New or Otherwise Noteworthy Plants from the Hawaiian Islands. Amer. Jour. Bot. 28:18-31. 1

----------. 1941. Additions to our Knowledge of the American and Hawaiian Floras. Field Mus. Nat. Hist. Bot. Ser. 22:407-441.

----------. 1942. Some Recently Collected Specimens of Schiedea (Caryophyllaceae) and of Mexican Compositae. Am. Jour. Bot. 29:332-333.

----------. 1942. Hawaiian Pittospora. Some Mexican Coreopsideae. A Note on Xylosma Hawaiiensis Seem. Field Mus. Nat. Hist. Bot. Ser. 22:467-580.

----------. 1943. Some Additions to our Knowledge of the Genus Schiedea Cham. & Schlecht. Amer. Jour. Bot. 30:606-608.

----------. 1944. Some Additions to our Knowledge of the Flora of the Hawaiian Islands. Amer. Jour. Bot. 31:151-161.

----------. 1945. Revision of the Genus Schiedea Cham. & Schlecht. Brittonia 5:308-339.

----------. 1945. Some Additions to the Genus Dodonaea L. (Fam. Sapindaceae). Amer. Jour. Bot. 53:499-510.

----------. 1946. Remarks upon certain Hawaiian Labiatae and Compositae. Bull. Torr. Bot. Cl. 73:184-193.

----------. 1947. A preliminary Study of Hawaiian Species of the Genus Rauvolfia. Additions to the Genera Scalesia and Hidalgoa. Field Mus. Nat. Hist. Bot. Ser. 23:321-356.

----------. 1947. Further Studies in the Genus Dodonaea. Field Mus. Nat. Hist. Bot. Ser. 23:269-317.

----------. 1948. A New Variety of Gnaphalium sandwicensium Gaud. in the Hawaiian Islands. Lloydia 11:309.

----------. 1949. Some New or Otherwise Noteworthy Dicotyledonous Plants from the Hawaiian Islands. Bishop Mus. Occas. Pap. 20:1-25.

----------. 1950. Miscellaneous Notes on Dicotyledonous Plants. Amer. Jour. Bot. 36:499-511.

----------. 1950. A Preliminary Paper on the Genus Nototrichium (A. Gray) Hillibr. (fam. Amaranthaceae). Bot. Leaflets 1:1-4.

----------. 1950. Notes on Certain Members of the Amaranthaceae, Caryophyllaceae, Euphorbiaceae and Compositae. Bot. Leaflets 2:1-6.

----------. 1951. Miscellaneous Notes on New or Otherwise Noteworthy Dicotyledonous Plants. Amer. Jour. Bot. 38:54-73.

----------. 1951. I. New Entities in the Genus Cheirodendron Nutt. ex Seem. (fam. Araliaceae) from the Hawaiian Islands. IV. Two Hawaiian Species of the Genus Sophora L. (fam. Leguminosae). Bot. Leaflets 5:1-14, 24-25.

----------. 1951. A Revision of the Hawaiian Islands Genus Nototrichium Hillebr. (fam. Amaranthaceae). Bot. leaflets 4:1-21.

----------. 1952. Some New or Otherwise Noteworthy Compositae from the Hawaiian Islands; II. Notes on Schiedea Cham. & Schlecht. (fam. Caryophyllaceae) and Phyllostegia Benth. (fam. Labiatae) in the Hawaiian Islands; III. Contributions to our Knowledge of the Genera Tetraplasandra A. Gray and Reynoldsia A. Gray (fam. Araliaceae) in the Hawaiian Islands. Bot. Leaflets 7:1-21.

----------. 1952. Further Studies of Hawaiian Araliaceae: II. Additions to Cheirodendron Helleri Sherff and a Preliminary Treatment of the Endemic Species of Reynoldsia A. Gray; III. Additions to our Knowledge of the Genus Tetraplasandra A. Gray (fam. Araliaceae). Bot. Leaflets 6:6-41.

----------. 1953. I. Further Notes on the Genus Tetraplasandra A. Gray (fam. Araliaceae) in the Hawaiian Islands; II. Notes on Miscellaneous Dicotyledonous Plants. Bot. Leaflets 8:1-26.

----------. 1954. Revision of the Genus Cheirodendron Nutt. ex Seem. for the Hawaiian Islands. Fieldiana, Bot. 29:1-45.

----------. 1954. I. Further Notes upon the Flora of the Hawaiian Islands. Bot. Leaflets 9:1-10

----------. 1955. Revision of the Hawaiian Members of the Genus Tetraplasandra A. Gray. Fieldiana: Bot. 29(2):49-142.

----------. 1955. With Thanks To All Who Aid Research. Chicago. Nat. Hist. Mus. Bull. 26:10-11.

----------. 1960. Some Dicotyledonous Plants Recently Collected in the Hawaiian Islands. Britt. 12(3):170-175.

Skottsberg, C. 1934. Astelia and Pipturus of Hawaii. Bishop Mus. Bull. 117:1-77.

----------. 1936. Vascular Plants from the Hawaiian Islands. II. Acta Horti Gotob. 10:97-193.

----------. 1936. The Arboreous Nyctaginaceae of Hawaii. Svensk Bot. Tidskrift 30(3):722-743.

----------. 1937. Liliaceae of Southeastern Polynesia. Bishop Mus. Occas. Pap. 13:233-244.

----------. 1937. Further Remarks on Hawaiian Artemisiae. Bot. Mag. (Tokyo) 51:196-202.

----------. 1942. Vascular Plants from the Hawaiian Islands. III. Pteridophytes Collected during the Hawaiian Bog Survey 1938. Acta Horti Gotob. 15:35-148.

----------. 1944. On the Flower Dimorphism in Hawaiian Rubiaceae. Arkiv. Bot. 31A(4):1-28.

----------. 1944. Vascular Plants from the Hawaiian Islands. IV. Phanerogams collected during the Hawaiian Bog Survey 1938. Acta Horti Gotob. 15:275-531.

Smith, A. C. 1942. Botanical Results of the 1940-41 Cruise of the Cheng Ho. Sargentia 1:1-143.

----------. 1943. Studies of Pacific Island Plants - III. New or Noteworthy Flowering Plants from Fiji. Bull. Torr. Bot. Cl. 70:535-549.

----------. 1949. Additional Notes on Degeneria Vitiensis. Jour. Arn. Arb. 50:1-9.

----------. 1951. Studies of Pacific Island Plants. IX. Notes on the Rutaceae of Fiji, Samoa, and Tonga. Jour. Arn. Arb. 32:226-255.

----------. 1951. The Vegetation and Flora of Fiji. Sc. Monthly 73:3-15.

----------. 1952. Studies of Pacific Island Plants, X. The Meliaceae of Fiji, Samoa and Tonga. Contr. U.S. Natl. Herb. 30:469-522.

Smith, A.C. & Kobuski, C.E. 1952. Studies of Pacific Island Plants, XI. Further Notes on Fijian Flowering Plants. Jour. Arn. Arb. 33:97-118.

Smith, A. C. 1952. Studies of Pacific Island Plants, XII. The Cunoniaceae of Fiji and Samoa. Jour. Arn. Arb. 33:119-149.

Waialua, Oahu, Hawaii.
Jan. 8, 1959.

Dear Al:

It was so nice for Isa and me having you for a couple of days here. As you now know, Mokuleia is a lonely spot and you should have stayed longer so that we could "pump you" botanically. We crave news about Mainland activities. Our only communication with the outside World is practically by letter, and that is not always very satisfying.

This afternoon I complained about my h.f.c. (helicopter frustration complex) to our tenant Sgt. McCoy (living opposite the young Whitakers). He then mentioned that his friend, a Major Swezey, 25th Aviation Co., Schofield Barracks, is in charge of all helicopters in the Territory. He told McCoy that at any time he wants a joy ride in a 'copter, he would take him up. This statement, of course, I would not repeat. But does it not appear as though it is not too difficult to get a hitch hike up to that plateau by merely asking a man like Major Swezey?

Now I don't know Smithsonian policy and neither want the institution nor you to stick your necks out, as one might say. But could you not write a noncommittal chatty letter to me stating some facts without necessarily committing your institution or yourself to anything at all? It is my suggestion, if it meets with your approval, that you write on Smithsonian stationary as is your wont. I would then, without involving you in any way, show the letter to my tenant McCoy, who could then pass it on or the information to his friend Swezey when the latter happens to come to the beach for a swim. Who knows? It might work to set me and an assistant on the "lost" plateau. How about something like the following:

Dear - - :

After visiting your islands and studying with you the U.S. Geological maps, it occurs to me that you should attempt to reach the two-mile long and one-mile wide 4,000 ft., high plateau due south of Hanalei Bay on Kauai. It is called Namolokama Peak. Evidently no one has ever botanized in this area. This plateau may be somewhat like the mythical "Lost World" about which Conan Doyle wrote some years back. The U.S. National Museum has not a single specimen from this extensive area, and is interested in getting a complete set of what grows there. The collection would be outstanding.

It would be a fete of considerable importance if some individual - perhaps a commercial helicopter cane duster or Government agency - had the vision to cooperate in getting you to that plateau, giving you a day to collect botanical specimens in gunny sacks or presses, and bringing you and your catches back to your base camp at Hanalei Village, etc., etc.

If I had some such letter, I would show it to McCoy, asking him to accompany me at a salary of $100 (or even $250 if need be, some of the cash to come from me privately and not all from NSF) per day. I would be ready at any time though the most favorable for flowering specimens is Spring rather than Winter. But in a case like this, beggars can hardly be choosers.

Aloha nui loa (in which Isa joins),

WAIALUA BRANCH

WAIALUA, HAWAII

59-117
1213

BANK OF HAWAII

Jan. 3, 1959 NO.

PAY TO THE ORDER OF Mr. A. W. Whitaker $ 25 00

Twenty five and 00 DOLLARS

DR. OTTO DEGENER
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

Dr. Otto Degener

Organ music lesson

January 8 1959

Mrs. Otto Degener
Waialua, Oahu.

To Alexander Whitaker III Dr.

Terms Waialua, Oahu.

1	drawing, ingenuone (with details)	$ 25	00

Received Payment in full.
1/8/59 A. W. Whitaker.

(copy)

Waialua, Oahu, Hawaii.
Jan. 3, 1959.

Dear Mr. Montagne:

With payment for a drawing of the Mexican poppy, we have exhausted the first grant from NSF. To simplify matters we are absorbing out of our own pockets the odd cents. Consequently the account should come to zero. #10 plus 1

Dr. A.C. Smith was here at the beach - had one swim - with us for two days. It was fun for us in this isolated spot. We, you see, are emphasizing the swimming on Jan. 3 just to make your mouth water for a real sensible climate. Mrs. Montagne and you better back your backs and fly West. Smith explained that the change from a fee of 10% to 15% by the Garden had been authorized by NSF, a fact unknown to us and hence a cause for alarm. We feared all our coming accounts would be garbled thereby, and eventually cause Washingtonian criticism.

We have been jogged out of our routine by Isa's mother suddenly developing a blind spot in one eye. She was drawing (free for us) a Trichomanes fern under the $225 "Cyclops" when it happened. Evidently her retina became detached. Her first operation failed, but the second seems successful. She must remain bandaged for another two weeks. I have been holding back from printing until she could make a few seed drawings - all that remains to complete another thickish fascicle.

I have instructed the insurance agent to contact the Garden about the car.

In detail, the final accounting is as follows:

July 31, 1958, on hand		$ 496.27
Sept. 5, 1958, received		800.87
		$ 1297.14
EXPENSES		
Printing	$ 496.27	
	272.34	
		$ 768.61
Drawings		35.00
Cycloptic Microscope	214.25	
& Micr.repair	49.16	
		263.41
Car upkeep, 3 recaps, major repairs		140.68
Equipment		35.71
Postage		64.43
		$ 1,307.84

To balance the budget, we are absorbing the $10.70 ourselves.

Aloha,

Otto Degener

THE NEW YORK BOTANICAL GARDEN STATEMENT OF ACCOUNT

INVOICE DATE		AMOUNT OF INVOICE	AMOUNT	ACCOUNT NO.
1/19/59	x	$ 1,200.00	$ 1,200.00	413

ENTERED CASH BOOK

APPROVED FOR PAYMENT

DETACH THIS STATEMENT BEFORE DEPOSITING CHECK

TELEPHONE LUDLOW 4-8500

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK 58, N. Y.

PRESIDENT
CHARLES B. HARDING
TREASURER
BERKELEY GAYNOR

VICE-PRESIDENT
FREDERICK S. MOSELEY, JR.
DIRECTOR
WILLIAM C. STEERE

January 19, 1959

Mr. Otto Degener
Waialua, Oahu
Hawaii

Dear Mr. Degener:

Thank you for your letter of December 14, 1958, with all the information set forth therein which has been noted with interest. As requested I am glad to enclose check in the amount of $1,200 on account of funds now on hand in your N.S.F. grant.

I hope you will watch your step; good botanists are hard to replace, and a back injury can be very distressing.

Not much new around here. We continue to make progress under the able leadership of Dr. Steere. We have plans for a new library wing to be added onto the rear of the Museum Building. Also we expect the City to make quite extensive repairs to the Museum Building this coming summer, so we will be a bit upset.

With best regards.

Sincerely,

H. de la Montagne

H. de la Montagne
Secretary

HM:k

TELEPHONE LUDLOW 4-8500

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK 58, N.Y.

PRESIDENT
CHARLES B. HARDING
TREASURER
BERKELEY GAYNOR

VICE-PRESIDENT
FREDERICK S. MOSELEY, JR.
DIRECTOR
WILLIAM C. STEERE

January 28, 1959

Dr. Otto Degener
68617 Crozier Drive
Waialua, Oahu, Hawaii

Dear Dr. Degener:

Thank you for your recent letter and for the encouraging report on your work. Mr. Montagne has shown me the letter that you enclosed for him and we were very much interested in the news from various fronts. How I envy Al Smith his visit with you, especially at this time of year.

Your remark to Mr. Montagne concerning your alarm over the change of the overhead fee from 10% to 15% requested by the Garden and authorized by NSF surprises me as in my letter of October 29th (last paragraph) I covered this rather fully. I hope that you will review my letter since I gave what we -- and the National Science Foundation -- consider to be adequate and valid reasons for this charge. After my own year with National Science Foundation and several years of administering grants and contracts at Stanford University, I can assure you that there is no reason for alarm on the part of the principal investigator since all he has to do is to calculate his actual need and then add the overhead for the institution, which is automatically given by the granting agency. The increase from 10% to 15% was reflected by an increase in the total amount granted, so you do not need to fear that we will simply take this extra 5% from the amount we assume you had estimated to be adequate to carry on your important work.

Sincerely yours,

William C. Steere
Director

wcs/gd

Waialua, Oahu, Hawaii.
Feb. 6, 1959.

Dear Mr. Montagne:

It was nice getting your letter and the enclosed NSF cheque. I also received Dr. Steere's kind letter. I knew from a previous one that he was to change the institutional charge from 10 to 15%, but had not been informed that Dr. Keck's NSF application had embodied this change

Paradise of the Pacific printing co., is under new management, with a "go-getter" from Calif., now in charge who, at our first visit to the shop asked Mrs. Degener for her first name. Then he remarked that her firm, warm handshake must be due to her having milked cows in her youth!!!!! We jus don't know whether such a brash idiot won't do something to this concern and bankrupt it & hence thought it wisest to pin him down, black on white, regarding business dealings before giving him additional jobs. So here is our copy of our letter to him. He has hardly had time to reply. Please return this copy to us someday when you must write anyway.

It is a funny feeling to be flattered and angry at the same time. My cousin in West Germany just wrote that his son's science teacher in high school showed around MY Fiji book in class, telling his students he had helped the translator with the botanical part! It is flattering to learn, purely by chance, that my book is interesting enough to warant translation, but it is certainly a nerve to translate it & sell the translation without my permission. I bet the teacher was simply duped and is perfectly innocent, otherwise he would not have showed the book proudly around in class.

Isa & I met a retired German publisher in Honolulu a few days ago who states that no one in West Germany can grap a work without first getting the author's permission. In the Russian Zone such theft is permitted. I am writing my cousin to get more information and to buy me a copy or two of this translation. If the law is in my favor, I want royalties to be paid to my parents-in-law in Germany. Isa & mother spent six months carefully translating my book in Germany, and we have the ms., here at home. We did lend a copy or two to a few German & Swiss publishers - who returned it unwanted. Were they the pirates?

I am gratified the Garden is getting a new library wing - you MUST make room for coming Book 6 of the Flora Haw.

A few weeks ago a hurricane ripped off the roofing paper of one of our rental units, and the beaver-board-like canec of walls and ceiling was soaked completely. We are covered by insurance and the company's carpenters supposedly repaired the damage. We then poked a hole in one ceiling panel, and Isa got a gal. or two of rainwater on her head. By threatening to call the Building Inspector from Honolulu, we finally got the insurance co., to agree to fix everything properly, we hiring & supervising the workmen ourselves. The damage is about 1,000, as the new canec must be painted two conts.

That reminds us, the NSF car is insured with this same company. You I believe have the policy. We should know its contents. Also, we privately insured the car against theft. Now that it is three yrs. old, perhaps we should let this lapse, but heighten liability. After this hurricane experience we are insurance conscious.

Enclosed is a bill to Bishop Museum for photostat work.

The season is unfavorable for collecting. Yet here are some seeds of a beautiful endemic hibiscus (H. Clayii) for Mr. Everett to propagate. It is almost Chinese red in color.

WAIALUA BRANCH

WAIALUA, HAWAII

59-117
1213

BANK OF HAWAII

Oct. 8, 19 59 NO.

PAY TO THE ORDER OF M. Alexander Waterhouse $ 25.00

Twenty five and no/100 DOLLARS

DR. OTTO DEGENER or
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

(Ushauring new species)

Dr. Otto Degener

THE NEW YORK BOTANICAL GARDEN

BRONX PARK NEW YORK 58, NEW YORK LUDLOW 4-8500

President
CHARLES B. HARDING

Treasurer
BERKELEY GAYNOR

Vice President
FREDERICK S. MOSELEY, Jr.

Director
WILLIAM C. STEERE

March 6, 1959
Air Mail

Dr. Otto Degener
Waialua
Oahu
Hawaii

Dear Otto:

I have had your letter of February 6 on my desk for several days trying to get time to answer it. I thank you for all the information contained therein and for the copies of the bills that you sent along.

In the second paragraph you refer to a copy of a letter to the Pacific Printing Company which you say you are sending to me and which you wish to have returned. I did not find copy of this letter enclosed with your letter.

As regards the institutional charge for overhead, I am enclosing herewith for your information copy of two letters from Dr. Smith at the National Science Foundation dated July 31 and September 17, 1958.

As regards the policy on your automobile I note that this expired on February 28, 1959. This policy is in process of renewal but rest assured that your car is fully covered. I have asked our insurance agent to send me an extra copy of this policy which I will be glad to forward to you when received.

You enclosed with your letter also seeds of Hibiscus Clayii, for which many thanks. I have passed this on to Mr. Politi, our Horticulturist, and I am sure this will make a striking addition to our collections.

With best regards,

Sincerely yours,

H. de la Montagne
Secretary

HM:md

P.S. The $5,000 U.S. Certificates of Indebtedness due Feb. 14 were redeemed with an income to you of $27.52 and new certificates in the same amount were purchased drawing interest at 3-3/4% due February 1960.

Paradise OF THE Pacific, LIMITED

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Dr. Otto Degener
Wailua, Oahu

DATE Mar. 9, 1959

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OUR ORDER NO. 64321

SHIPPED VIA

TERMS: 30 DAYS NET SOLD BY

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT	TOTAL
16	Lots Flora Hawaiiensis			
	Family 169b Leguminosae 47.37			
	" 98 Proteaceae 47.87			
	" 17d Aspleniaceae 44.77			
	" 190 Euphorbiaceae..... 44.50			
	" 306 Asclepiadaceae..... 44.42			
	" 169e Leguminosae..... 47.72			
	" 117 Portulacaceae 44.57			
	" 117 Portulacaceae 35.38			
	" 216 Sapindaceae..... 51.28			
	" 332 Rubiaceae..... 46.62			
	" 328 Acanthaceae 46.62			
	" 17a Aspleniaceae 33.12			
	" 242 Cochlospermaceae 49.62			
	" 325 Gesneriaceae 50.68			
	" 98 Proteaceae 44.42			
	" 263 Lythraceae 44.17			
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	" 117 Portulacaceae 44.57			
	" 117 Portulacaceae 35.38			
	" 210 Sapindaceae..... 51.28			
	" 332 Rubiaceae..... 46.62			
	" 328 Acanthaceae 46.62			
	" 17d Aspleniaceae 33.12			
	" 242 Cochlospermaceae 49.62			
	" 325 Gesneriaceae 50.68			
	" 98 Proteaceae 44.42			
TRIPLICATE	" 263 Lythraceae 44.17			

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By E.C.

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WAIALUA, HAWAII, U.S.A. March 10, 1959 No. —

WAIALUA BRANCH

BANK OF HAWAII 59-117

PAY TO THE ORDER OF Paradise of the Pacific $723 13/100

Seven hundred twenty-three and 13/100 DOLLARS

Dr. Otto Degener

Job
34791
64327

Waialua, Oahu, Hawaii.
March 10, 1959.

Dr. David D. Keck,
National Science Foundation,
Washington, D. C.

Dear Dave:

Paradise of the Pacific printers now are under new management so I gave a single sheet, a new Hibiscus endemic to Kauai, to the local newspaper to print for the Flora. I thought it would be wise to let the new "Paradise" owner know we need not remain with him if he contemplates raising prices. He he tells me that he could reduce cost of cuts by about two-thirds if I print by the photo-offset process. The cash saving is not sufficient to make up for the inferior appearance, however.

Well, anyway, here are the six samples NSF desires. This fascicle was printed several days ago. I am addressing about 100 envelopes to interested institutions and individuals, and am holding all from the mail (including this letter) until March 15, official date of publication.

Another form is in page proof. I need a few magnifications and type locality quotes.

Assuming that NSF wants the work widely used for which grants are given, Isa & I have offered gratis a copy of Book 5 to each member of our Botanical Society who wants one. We are also sending this and previous volumes to interested persons. Perhaps eventually we should send copies to local High Schools as Dr. Gowing suggests in the accompanying letter.

Collecting expenses are terrific, and such gifts of books may smooth the way financially and otherwise for field work. I sent a set of my books to a Mr. Fleming (sugar executive) of the Island of Maui, and he now has arranged for us to make use of a cabin at 3,000 ft., elevation. He thought we want it for a day, so I offered to rent it for a week at least. It is in a strategic locality with novelties (?) galore. We cannot complete Book 6 and do field work unless we get such help.

Isa and I hope you and your family are not freezing in Washington. My sister reports New York terribly cold, but little snow.

Aloha,

Waialua, Oahu, Hawaii.
March 13, 1959.

Dear Mr. Montagne and Dr. Steere:

I have the "Moutagne letter" of March 6, and enclose the letter of Morrill Johnson, the new printer of the Flora. Evidently we are fully protected. I did send one sheet to the local newspaper for printing just to see whether we are dependent on Johnson should he wish to raise prices. This sheet is in page proof, looks satisfactory and the quoted price is similar to that of Johnson.

A.C. Smith, when visiting us on Oahu, explained to us that the change in book-keeping fee from 10% to 15% had been authorized by NSF months ago. It had been figured in with the appropriation, so of course there is no %5 error in figuring as we had feared.

Enclosed is a printing bill for a fascicle officially published March 15. I likewise have an outlay of $25 for the drawing of the new Kauai hibiscus. Other expenses are mainly postage, for a little equipment, and gas & oil to Museum or printer & return. This we shall give you in toto at the end of the first half year.

We assume that the NSF wants books, printed with their help, used and not simply stored away. Hence Isa & I offered Dr. Gowing, President of our local Botanical Society, a free copy for any member wanting one. Dr. Gowing then suggested we likewise give complimentary copies to the local High Schools. We are not too eager to reduce our printing and collecting funds by losing ALL potential customers. Well, anyway, this last is still in the offing.

This assembling, binding and wrapping of Book 5 takes hours from our actual botanical studies. We are simply trapped. I fear Book 6 must be assembled by the printer. This drudgery is just too much for us.

We have another fascicle in page proof at the printers and plan doing field work on the Island of Maui as we have a "partial" invitation - a free shack in a grand collecting area - that will reduce expenses. Car. transport will come to about $50. We had planned botanizing on Kauai this month when a Mrs. Ruth Hanner, rewident there, was expected back from Europe. She, however, changed plans, and won't be on Kauai until April. She is interested in Nature, and is related to many sugar plantation families. When visiting her last, she was able to "commandeer" free horses, trucks, etc., to help us. She is sponsor of a local museum, and for her many kindnesses we helped a bit with exhibits, like getting Drosera, the sundew.

Please air mail us all non-working cash available for coming printing bill & field work.

Aloha,

THE NEW YORK BOTANICAL GARDEN

BRONX PARK NEW YORK 58, NEW YORK LUDLOW 4-8500

President
CHARLES B. HARDING

Treasurer
BERKELEY GAYNOR

Vice President
FREDERICK S. MOSELEY, Jr.

Director
WILLIAM C. STEERE

March 17, 1959
Air Mail

Dr. Otto Degener
Waialua
Oahu
Hawaii

Dear Dr. Degener:

I have your letter of March 13 which has been noted by us here including Dr. Steere, with interest. As regards the final paragraph of your letter, I am not clear how much money you want. Your account stands this way:

Received from N.S.F.	$6,200
Less 15% overhead	930
	$5,270
Remitted in 1959 (Jan.)	1,200
	$ 4,070
Add interest on U.S.G. Bills	27.52
Balance due you	4,097.52

As you know, the original investment in U.S. Government Certificates matured and $5,000 was reinvested in new bills falling due in February 1960. What part of this money do you now want us to remit to you, or do you wish us to remit all of it?

As regards your automobile, I am in receipt of the new policy in renewal of this insurance which expires February 28, 1960. The premium on this was $39.50 which, incidentally, should be deducted from the above account. I enclose the original policy herewith and have kept a certificate of insurance in our file here.

With kind regards,

Sincerely yours,

H. de la Montagne
Secretary

HM:md
encl.

Waialua, Oahu, Hawaii.
March 30, 1959.

Dear Mr. Montagne:

I have your March 17 letter.

We are so elated! Tuesday we fly to the Island of Maui to botanize on the little-known slope of the mountain Puu Kukui. A physician's young son, who reads the rain gauge at the summit came to us day before yesterday to give us final instructions. We shall have use of a shack at the 3,000 ft., level. We will not take the car as he considers the road passable only for his 4-wheel drive jeep, so we will rent that. We expect to find novelties.

To expedite matters I am taking along customs tags and wrapping paper. In the field we shall label Lobelias, which Dr. Wimmer needs for his coming revision; Mikstromia and Scaevola, which Dr. Skottsberg needs for his coming revision. We can then mail such packages off direct to these specialists from the country post office, instead of carting all to Honolulu & paying unnecessary air freight on them.

As you know, we have another fascicle in page proof that should cost about the same as the previous one. Then we shall need cash for the Maui exploring trip and, probably, cash for a Kauai trip. With this in mind, I believe you should mail us $ 1,600 and keep most of the remainder, if possible, at work in the form of U.S. Certificates, if it is not too much bother.

Regarding the Island of Kauai, we just heard from Mrs. Ruth Hanner's cousin, Mrs. Ida L'Orange, that the former will soon return home. If she will help defray our expenses on "her" island to get the plants there better known, we will go there after "digesting" our Maui catch. If not, I fear we should plug away at publishing further fascicles for Book 6. Then when that is completed, we should spend all the remaining cash of the grant (I doubt there will be any) in field work. Of course whenever an inexpensive opportunity for field work should arise (as in the Puu Kukui, Maui case thanks to my liberally salting Maui residents with Fees Flores), we would take advantage of it.

The Advertiser newspaper printed Hibiscus clayii for us, of which I mailed seeds for Mr. Everett. Their bill, however, has not yet come.

We just detest staying home or at the Museum working on Herb. specimens when exploratory work beckons on the other islands. You don't know how happy we are. I feel like a retired fire engine horse again allowed to race to a fire. You & Mrs. Montagne really should pack up next winter and see how fine your 50th State really is. I believe Dr. Steere and the Trustees are happy that N.Y.B.G., has been interested in this area since 1922 and probably has the very best Haw., collection. No one has ever collected as much as I, and the Garden has always received the cream of my findings.

Aloha,

Otto Degener

(My [illegible] on a packed)

Waialua, Oahu, Hawaii.
March 20, 1959.

Dear Dave:

It is a shame pestering you with just a single sheet. This is the job the "rival" concern printedfor us. It is of a new Hibiscus of which I mailed seed to Dr. Egolf of D.C. Arboretum. Should you meet him, give him our aloha.

We fly to Maui Tuesday for collecting about Puu Kukui. Handing out complimentary copies of the Flora to plantation managers and to potential horticulturists and botanists smooths the way for field work.

Another fascicle is in page proof at the old printers but that job can wait until our return with Maui loot. Then, anyway, we will have cash from Mr. Montagne to pay the bill. I don't want too much of it here at a time.

If we get a similar offer of cooperation from Kauai to reduce our expenses, we shall go into the field there next. If not, we shall plug away on fascicles for Book 6 UNTIL some local help turns up.

According to the rain gauge reader, the season is still too early for Puu Kukui summit lobelias to be in flower. But never mind. There will be plenty to collect on the sunny, lower slopes.

Aloha,

STATEMENT

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PUBLISHERS OF **THE HONOLULU ADVERTISER** OWNERS OF RADIO STATION KGU

CABLE ADDRESS — ADVERTISER
P. O. BOX 3110 PHONE 52977
ADVERTISER SQUARE
HONOLULU 2, HAWAII

MAR 3 1 1959

DR OTTO DEGENER
P O BOX 187
WAIALUA, HAWAII

TO INSURE PROPER CREDIT TO YOUR ACCOUNT, DETACH THIS PORTION AND ENCLOSE WITH YOUR REMITTANCE

				PAST DUE	CURRENT	BALANCE
BALANCE FORWARD AS OF ⟹						
DATE	DESCRIPTION	SPACE	RATE	CHARGES	CREDITS	
MAR 31	83545,417 3000 SHTS MALVACEAE, MALLOW FAMILY			48.15		48.15

EXPLANATION OF KEY SYMBOLS

LD—LOCAL DISPLAY JB—JOB PRINTING
CL—CLASSIFIED LG—LEGAL
NA—NATIONAL RA—RADIO
MS—MISCELLANEOUS CM—COMMISSION
CS—CASH

THE HONOLULU ADVERTISER — ADVERTISER PUBLISHING COMPANY HONOLULU, HAWAII — RADIO STATION KGU

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

April 3, 1959

Dr. Otto Degener
P. O. Box 187
Waialua, Hawaii

Dear Otto:

Thank you very much for your letter of March 10 and the six sets of reprints from the new Illustrated Flora of the Hawaiian Islands. It is pleasing to see that you continue to have such competent artists helping you with this Flora and you are indeed making a valuable permanent record of the vegetation of your archipelago.

I hope that the printing costs will not advance under the new management at the Paradise Press.

I am glad you are looking for ways to disseminate the Flora more widely. The National Science Foundation does not subsidize publications for free distribution on a wide scale, but your activities in this sound commendable.

I am glad to hear you have found some helpful cooperation for exploration on Maui. It seems to me the continuation of field work in strategic areas is important.

We are all very pleased about Hawaiian statehood.

Although it has been colder in Washington than usual, it is milder than New York and my family has been very pleased with the weather. Of course, we realize nothing can compare with that in Waialua! Best regards to you and Mrs. Degener.

Sincerely yours,

David D. Keck
Program Director for
Systematic Biology

Waialua, Oahu, Hawaii.
April 10, 1959.

Dear Mr. Montagne & Dr. Steere:

Enclosed is a bill for printing the new species of Hibiscus of which I mailed the Garden seeds some weeks ago.

We returned from our field trip last Friday and did not get our catches out of the drier until yesterday, Thursday. When some cancelled cheques and receipted bills arrive from Maui, we shall mail them to you in a later letter. Off hand, we fear our collecting costs averaged about $30 per day.

Isa, I and a 25 year old rain gauge reader ALMOST reached the summit of Puu Kukui at 5788 feet. We were too exhausted to go beyond the lower bogs where we collected the three kinds of silverswords (Argyroxiphium), none in flower. We sank into mud up to our knees, which is truly exhausting when both legs are in the mire at the same time. It rained - it usually does there - and with the howling wind I experienced a temporary earache on the windward side of my head. We were overloaded with booty and even had to abandon some of our early and less desireable catches along the trail such as Wikstroemia and Pittosporum. Lobelia gloria-montis was not in flower, but we got good fruiting material for Dr. Wimmer. In short, we must return to Puu Kukui in late summer to get the species flowering at that time.

We wanted to get a celery-like Peucedanum known from the cliff trail leading into the leper settlement at Kalaupapa, Molokai. I had prepared for this hunt about two weeks ago. When a physician in Honolulu asked me for one of my reprints of Dr. Hillebrand's biography, I overwhelmed him with complimentary copies of my books, and at the same time asked his advice as to getting into the settlement. He wrote the government physician Dr. Kramer, at the leper settlement in our behalf who then wrote us our instructions.

We arose at 4:30 A.M., at our headquarters on the slope of Haleakala, Maui, Friday. We enplaned for Molokai around 8, reaching there 20 minutes later. At the airport I phoned Dr. Kramer that we should reach the bottom of the cliff trail between 3 and 4 P.M. I asked for a taxi to be at the trail end to take us to the airport where a private plane would then fly us home to Oahu. Instead of a taxi, he replied he would meet us with his own car.

We browsed slowly down the trail, collecting the Peucedanum, Chamaesyce, Wikstroemia, a few grasses, Plectranthus, Lipochaeta, the true tapa plant Broussonetia, etc., etc. At the end of the trail we saw two cars parked at about 3 P.M. By the time we got there, I loaded down with 2 corrugated cardboard boxes full of plants, the rain gauge assistant and Isa also loaded, the cars were gone. Thus we three dishevelled tramps marched through a seemingly typical Hawaiian village, apparently deserted, until a young policeman of Filipino extraction hailed us and conducted us to the Administrator's home.

The officer's right hand was a bit twisted and shortened as with arthritis, and his left hand a bit swollen and pimply. We noted no other evidence of illness. The Administrator, and Dr. Kramer who soon followed, informed us that our plane had cancelled its flight. Mr. & Mrs/ Berlem invited us into their home for coffee, an invitation we thought wise to decline. Then the Administrator and physician kindly insisted they would be glad to see as house guests until our plane should arrive the next day. That was the only thing for us to do.

THE NEW YORK BOTANICAL GARDEN

BRONX PARK NEW YORK 58, NEW YORK LUDLOW 4-8500

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CHARLES B. HARDING

Treasurer
BERKELEY GAYNOR

Vice President
FREDERICK S. MOSELEY, Jr.

Director
WILLIAM C. STEERE

April 21, 1959

Dr. Otto Degener
Waialua
Oahu
Hawaii

Dear Otto:

Just a line to acknowledge receipt of your two most interesting letters of March 20 and April 10. These have been noted by all of us here at the Garden with keen interest. I hope the trips described have justified all your effort and that of Mrs. Degener.

I note in your letter of March 20 that you would like a remittance in the amount of $1,600 from your grant and I am pleased to enclose herewith check in that amount.

With kind regards and best of luck,

Sincerely yours,

H. de la Montagne
Secretary

HM:md
encl.

Waialua, Oahu, Hawaii.
April 22, 1950.

Dear Dave:

It was nice getting your two letters. This is not an official answer to them but simply random gossip.

We are back from our field trip. We were lucky in hiring the young rain-gauge reader of Puu Kukui, West Maui, as assistant for $100 cash plus incidentals. We failed to make the summit of Puu Kukui but got into the lower bogs where the three West Maui endemic Argyroxiphium species thrive. A. grayanum rings the bogs while the other two species are immersed in the thick moss with just the bulky rosettes showing. The trail passes through areas of muck which, when both legs are in it up to the knees, is terrifically tiring. It takes lots of horse-power to overcome suction as one tries to withdraw one leg to press forward. We collected more than we could carry, leaving some caches along the trail. Well, anyway, it was not A. flowering season, so we collected a few sterile specimens and remains of A grayanum inflorescences. The other species observed had none.

Now that the rain gauge reader, Ward Fleming, knew what we wanted, he brought us an excellent A. grayanum, which is here enclosed. I bet it makes your mouth water. Please pass it on either to Al Smith or to McK., whichever you prefer. As you may remember, the species is already described & illustrated in the Flora Haw.

Isa and I are a bit confused as to the general policy we should pursue. Should the first set of our catches go to the Govmnt., from which our grant flows, or to the Garden of which I am (/) or am not (?) a staff member without salary? There is such a thing as cluttering up the Garden cases with Haw. plants that may no longer be wanted after the Garden has received such material from me free ever since 1922. Some day you might express your ruling on this point.

I am rather proud how Isa & I planned this trip to include collecting on two islands for the price of one so far as transportation was concerned: By passing out Floras galore and gratis to physicians and administrators, we are unusually welcome to browse around for plants. So at 4:30 A.M., we rose and left our second base camp at 3,000 ft. on the slops of Haleakala, EAST Maui, and drove to the airport. Here we three enplaned for Molokai at 8 A.M., and got a U-Drive car to collect along the lee coast (largely Wikstroemia for Skottsberg). Then at 1 P.M., we picked our taxi driver up at Kaunakakai to take us to the cliffs overlooking Kalaupapa, the leper settlement. We had been granted permission from the settlemt. physician and the administrator to climb down the 3 - 4 mile long zigzag trail to the colony. This is where the strange endemic Peucedanum grows, of which we got excellent material. I even airmailed living material to Hiroe in Japan for planting. He has already replied that it arrived o.k.

Some one at at the bottom of the trail was to pick us up in a car at 3 or so, and drive us to the little airport where the rain gauge reader's brother was to pick us up in his 4-passenger plane for our trip home to Honolulu.

When half way down the cliff, we say two cars parked at the end of the trail. But when we reached there with our bundles, they had gone. So we wearily trudged through the leper settlemt until a Filipino policeman

with one crippled and one pimply hand brought us to the administrator's home. Here we heard the astounding news that our plane would not call for us that day! We were invited to stay over night at the physician's and administrator's homes. Invitations we did not refuse as we suspect that arrested cases of leprosy may be working as servants in the kitchen & elsewhere.

We did some frantic phoning from Molokai to Maui and finally discovered that not our plane, but another, had changed its schedule. At four our Blue plant hove in sight, we loaded our plants and selves inside, and twenty minutes later we (the rain gauge reader as free stowaway in his brother's plane) were in Honolulu. The trip cost us $30. I doubt many botanists have collected in the area, and are rather happy about our catch of endemics.

It does bother us, however, that this field trip of about two weeks cost close to $300, or almost the price of 12 illustrated pages for the Flora. If we are to win another grant three years hence, we need publications.

As you know, we are siphoning certain genera to their respective specialists. I am asking that they add a paragraph to papers involving these plants to the effect that the Degenerian ones were gathered with aid of N.S.F. What happens if they ignore my plea, and are you to get six copies of such papers for your files?

We plan going to Canadan to the Congress this summer, part of the expense being tax free. It is time we brushed up on matters botanical, and not become too fossilized out here in the wilds of the Pacific.

Aloha,

THE NEW YORK BOTANICAL GARDEN STATEMENT OF ACCOUNT

INVOICE DATE		AMOUNT OF INVOICE	AMOUNT	ACCOUNT NO.
4/23/59	x	$ 1,600.00	~~$ 1,600.00~~	~~314~~

ENTERED CASH BOOK

APPROVED FOR PAYMENT

DETACH THIS STATEMENT BEFORE DEPOSITING CHECK

Waialua, Oahu, Hawaii.
April 25, 1959.

Dear Mr. Montagne:

Having been on an expensive field trip lately, it was perhaps appropriate to get this little form out of the way. Being blank on the back, it passes through the press only once and is consequently cheaper to print than a form with printing or illustrations on both sides. The bill comes to $165.60, for which our cash has been depleted. The last sum left from NSF went for the Maui & Molokai field trip for which we have not yet received all our receipted bills or cancelled cheques to mail you. I wrote a second time to Maui for the return of the bill receipted about our Leper Settlement flight.

We will not distribute this fascicle to libraries and interested individuals until April 30, the date cited at end of pages. We admit this fascicle is rather boring, but we must get it into print

There is a botanically unknown Gap extending from the inside of Haleakala through Keanae to the ocean. We plan to ask for cooperation from the Supt. of Hawaii National Park to botanize there, preferably in June. If with such cooperation it can be managed cheaply, we shall go. Otherwise we had better stay home and continue working up plants found in the neighborhood.

Pretty soon you should be surrounded by blooming Forsythias and Lilacs, and the horribly cold season of N.Y.C., will be pau.*

Aloha,

*Haw. word for finished.

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Waialua, Oahu

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QUANTITY	DESCRIPTION			UNIT PRICE	AMOUNT	TOTAL
8	Lots Flora Hawaiiensis					
	Family 328	Acanthaceae	20.70			
	" 137	Lauraceae	20.70			
	" 305	Apocynaceae	20.70			
	" 338	Campanulaceae	20.70			
	" 302	Loganiaceae	20.70			
	" 21	Psilotaceae	20.70			
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	" 107	Aristolochiaceae	20.70			165.60

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BANK OF HAWAII

April 28 1959 NO. —

PAY TO THE ORDER OF Paradise of the Pacific Ltd. $ 165 60/100

One hundred sixty five 60/100 DOLLARS

DR. OTTO DEGENER or
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

Total for Bill of 4.23.59.

Dr. Isa Degener

Waialua, Oahu, Hawaii.
April 30, 1959.

Dear Dave:

With the $300 more or less field trip back of us we thought it wise to get out an inexpensive fascicle, printed only on one side, out of the way. It is boring, we admit, but it is necessary for the Flora. The printing came to $165.60. Here are the six copies for NSF.

Now that I have mailed all our recent catch of lobelias to Dr. Wimmer, I hear the poor fellow, 77 years old, was just operated for cancer of the intestines. I hope all goes well. His heart is weak.

Wonders never cease! Years ago I gave a lecture on Hawaii at Merion, Pa., at The Barnes Foundation. The late terrible tempered Mr Barnes (so a Saturday-Evening Post article once described him) invented argyrol. Mrs. Barnes has been mailing me programs of the courses she sponsors or herself gives at the Foundation, and I mailed her a complimentary copy of Book 5. Now I got a cheque for $100.00 from her with the statement: "I enclose check for $100.00, which I hope will help the worthy cause." Isa and I are using this cash (that is $96.20 of it), to publish a Chamaesyce and an Ipomoea, stating under each "Aided by The Barnes Foundation" I thought you should know this because I remember NSF asked, when I applied for the grant, whether I was asking for aid anywheres else besides. I did not then, and I have not since. The cash is certainly welcome, offsetting a third of the cash we spent on the field trip.

We are distressed to read in our newspaper that our Governor signed a bill mandating the introduction of axis deer to the Island of Maui. With no natural control, they will eventually wreck our endemic vegetation in two ways: Directly, by browsing on the plants and indirectly, by reducing the hunting pressure on our less interesting and less tasty feral goats.

Aloha,

C.H.

Waialua, Oahu, Hawaii.
April 30, 1959.

Dear Mr. Montagne:

Here is the receipted bill of $165.60 for the last NSF printing by "Paradise of the Pacific." I mailed you the 8 sample sheets in a previous letter. Enclosed is the $50 for our trip by private plane from the leper settlement to Honolulu. This trip may have been a bit foolhardy as part of the time we flew only 50 feet above the ocean. Had our engine coughed, I guess we would have plowed to the bottom and staid there forever. At one spot we say what appeared to be an oil slick with a few frigate birds flying excitedly about it. This was not caused by oil but by a school of fish whose swimming broke the normal ripples of the ocean surface.

The $40.52 bill is for equipment. There is still a cheque of $100.00 outstanding for Ward Fleming whi attended to our needs so admirably: jeep & trailer for selves and equipment, a house each in twoseparate collecting regions, help with collecting and pressing, and even "mooching" hot showers for us in his physician-father's private office.

The two cancelled cheques for $31 and $50 to Alexander Whitaker are for drawings made on Oahu & they have no connection with the Maui-Molokai trip. I believe I mailed you one of his previous bills for $25 for a hibiscus drawing. These cheques are for other drawings. Do please verify that I did not send you receipted bills for these two same ammunts. If I did for one of them, please ignore that cheque in the account. We got a bit confused due to our collecting trip and the fact that Whitaker, the soldier-artist, left the Service and is on his way to take summer courses on the Mainland, Va., or thereabouts.

The "red purse" expense comes to $ 165.76. A large part of this is for plane transportation for us and baggage, for food, kerosene, etc.

I rushed lobelias to Dr. Wimmer in Vienna for inclusion in his forthcoming revision of the lobelias of the World. The poor man was operated upon a few weeks ago for some intestinal trouble that turned out to be cancerous.

Wonders never cease! I mailed Mrs. Barnes of The Barnes Foundation a copy of Book 5. I had delivered a lecture about Hawaii at her Merion, Pa., Arboretum 20 or more years ago. She mailed me a cheque for $100. This we put into printing, with the note "Aided by The Barnes Foundation." As we did not touch the cheque except to endorse it over to the printer, I should think no tax loss is involved.

Aloha,

Otto Degener

WILLIAM F. QUINN
Governor

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ANIMAL INDUSTRY
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Division of Forestry
Division of Parks
WALTER W. HOLT, Territorial Forester

KAHULUI, MAUI

May 4, 1959

Prof. Otto Degener
68-617 Crozier Dr.
Waialua, Oahu

Dear Professor Degener:

Thank you for your letter of April 26th, and for your book "South Pacific Expedition: Fiji".

Your letter was read with interest and I am sure that your book will prove very interesting when I get to it.

Hope to see you next time you come to Maui.

Sincerely,

Karl H. Korte

Karl H. Korte
Associate Forester

KHK:fm

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

May 5, 1959

Dr. Otto Degener
P.O. Box 187
Waialua, Oahu, Hawaii

Dear Otto:

Thank you for the six copies of the new fascicle. I am continually amazed at the number of exotics you find to describe in the Hawaiian Flora. I hope that the Hawaiian natives get their full share of your attention before time runs out on you.

Your letter brings the unfortunate news about Dr. Wimmer, but also the very happy item about the check from Mrs. Barnes. We shall be delighted to see a few pages appear with the note "aided by the Barnes Foundation".

Your frequent references to their depredations makes me hope that you live on nothing but the meat of feral goats.

Your cheery letters brighten our days here, even though my assistant heaves a sigh every time she has to tear our books apart once more to insert the new pages!

Our best wishes to you both,

Sincerely yours,

David D. Keck
Program Director for
Systematic Biology

THE NEW YORK BOTANICAL GARDEN

BRONX PARK NEW YORK 58, NEW YORK LUDLOW 4-8500

President
CHARLES B. HARDING

Treasurer
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Vice President
FREDERICK S. MOSELEY, Jr.

Director
WILLIAM C. STEERE

May 5, 1959
air mail

Dr. Otto Degener
Waialua
Oahu
Hawaii

Dear Otto:

Just a line to acknowledge your two letters of April 25 and April 30 which have been noted here with interest, as usual. I am glad to tell you in response to one of your comments that Spring has arrived at The New York Botanical Garden and we are really finally, after a cold and rainy spring, enjoying wonderful weather.

I don't believe there is anything calling for particular comment in your letters. You are always very gracious about explaining everything and we appreciate it and I feel a little guilty that we send you so little in return.

I note on your P.S. that you need cash. We still have part of your funds invested in Government certificates but we recently sent you $1,600 and I am wondering if you still need more. If so will you bother to let me know again, and how much.

With best regards,

Sincerely yours,

H. de la Montagne

HM:md

May 6, 1959.

Dear Mr. Montagne:

We had another sleepless night carrying furniture upstairs and silverware and other valuables into the car. Then the tidal wave warning luckily did not materialize and we spent a day or so getting everything in the house ship-shape again.

Here is the canceled cheque from Ward Fleming for the Puu Kukui trip.

We plan going with Fleming, Joe Dowson (assistants), Mrs. Robert Bento (artist), to Maui the latter part of this month to explore botanically Koolau Gap extending from the "crater" (really a rift valley) of Haleakala through Keanae Valley. We are interested in the upper part where the endemics are most common; not at lower elevations where introduced weeds prevail. All this will be expensive, and we fear we are depleting too much NSF cash for printing necessities. I am now feeling out the National Park Service in regard to a 2 or 3 months assignment as Ranger-Naturalist to make up for our coming extravagance. It would not take too much time off from the Flora project since work on the plants of the Park would largely fit into Flora Hawaiiensis. It would be a good way to get to the Island of Hawaii and gather material for pickling and later illustrating here on Oahu. All this is tentative, so no use repeating.

Aloha,

May 7, 1959.

Dear Mr. Carpenter:

We have your letter, and thought we would wait until we might hear from Dr. Ruhle before answering. As his letter has not yet come, I guess we had better make the following tentative plans if you think them wise:

1. We should like the use of the Holua cabin for about 10 days beginning May 27 for the four of us. That would leave room for occasional tourists , if I remember the cabin correctly.

2. The "four of us" would be Mrs. Degener & I; Joe Dowson, police officer and assistant of mine when he was a youngster years ago; and of course Ward Fleming if the dates are right for him. You, on Maui, know better about Fleming's plans than we do here on Oahu. Then a comfortable bunk is needed for our honored visitor: Bob Carpenter.

3. What bothers me is how to rig up a drier at Holua - I need some boards of something like what we had at Hailaau. You saw what I had. I am ~~fully~~ ready to pay for the necessary boards and to get them to Holua if I can't do it May 27 myself.

4. We need about 2 gals. of kerosene for the drier alone per day. Naturally I would pay for this fuel and, incidentally, for all food for our party and our guests. Also for odds and ends involved by the "expedition."

5. We want to work from Koolau Gap down into Keanae, not trying to make distance but getting a specimen of every kind(with duplicates) of plant there (provided in fl. and fr., so it can be identified). Sterile plants are pretty much a waste of time as you know. I plan pickling fls. as much as possible to get them drawn when back on Oahu.

6. Mrs. Degener may arrive on Maui a couple of days before, and buy groceries. Then when Dowson and I arrive in the morning, perhaps with Fleming's help, we can get to Holua cabin easily the same day. She may take a quicky tour of Maui with her mother, who is presently visiting us. Then when her mother leaves Maui for Honolulu, my wife would pick us up for the trip to Holua.

7. You understand that we want to get material for Book 6 of the Flora Hawaiiensis with whose publication the Nat. Sciencce Foundation is interested.As many of the Koolau-Keanae plants certainly spill over into the Haleakala Section, the drawings in many cases should be suitable for a bulletin perhaps by the National Park. It would flatter us a lot if they were used that way.

We are excited about this proposed trip AND are eager for your suggestions and advice.

Aloha,

May 9, 1959.

Dear Dave:

We have your recent letter about the abundance of exotics in our flora and consequently Flora. It is all a matter of math.

I have practically no artist. Dr. Wimmer, for about $7.00 per drawing., has had a hospital patient in Vienna draw for us. But last month poor W. had an operation for intestinal cancer, and that may be the end of further lobelia drawings.

I had Lincoln Constance get his University artist draw the endemic Peucedanum. Do you know what this fellow charged? $45.54. I think this is highway robbery and complained to Constance about it. At that rate, I would be dissipating NSF funds inexcusably fast. By the way, now that we again studied the plant along the leper trail above Kalaupapa, we plant to print soon. We need the Kauai Peucedanum really to do a good job but can't find decent material in the herbarium. I have never found it alive, and it may be extinct.

This is what Isa & I are doing to conserve cash: I have a back-log of unprinted drawings incomplete perhaps for lack of flower, for fruit, or seed. Many of these are of exotics and were drawn as much as THIRTY years ago by youngsters I had trained for such work. Many of these boys are now fathers, some even grandfathers. I had paid them $30 per month plus board and room, and when out of the industrial school or the home for feeble-minded and on parole to me, for $15 per month. Naturally, now a married man, I can't have embryonic criminals in the house.

When such boys were not doing house- or yard work for me or botanizing with me, I kept them busy make drawings. I could in such cases not dash off into the mountains every time their hands were idle. Hence I would hand them some plant growing right in my front yard or one that I could pick up within ten minutes or so by walking along the road or RR tracks.

For economy's sake I am trying to use up such drawings as the only cost for their publication is the printing cost. The cost for artist is just about nil. During the last two months I got a soldier, Alex. Whitaker interested in cartooning, to draw the new Hibiscus clayii for us. The drawing is not expert by any means yet cost $25. It is better than the Peucedanum cost. Then he made lots of miscel. drawings of seeds, fls., capsules and a habit sketch of a Canavalia (for whose flower I am still watching) for another $75 or so. It cleans [illegible]

5/9/59

capital otherwise tied up and useless in my ms., trunk. This phase has presently ended as the Whitakers left for Va., last week. I am now trying out a lady, but am not yet sure of results.

It may interest you to know that the Psilorhegma glauca drawing, published March 15, 1959, was completed, except for seed recently drawn, by tragic Toshio Yamamoto who was paroled to me from the TB sanitarium previous to 1930, and died about 1933 of the disease. I came to New York, and hence he neglected his health.

Drawings by K.K. Park, appearing quite often in Book 5 and coming 6, were executed before ~~1935~~ 1935. Park is the Korean boy I took to the Bronx to draw for me during Dr. Merrill's regime in 1933-35. Park has not worked for me for a score of years.

Our West Maui trip came close to $300; our East Maui trip, to start May 27 with use of horses, we expect will cost $400-500. I just MUST print some of the exotic "junk" as otherwise I won't be able to print hardly anything. I just cannot afford to pay fancy professional artist prices too often, as in the case of Peucedanum.

We are excited about the coming trip - taking Fleming and a young police officer along to help us. We may be obliged to cut trail with cane knives through Dicranopteris jungles to get at bot. prizes. I know this Koolau Gap area of Haleakala, having botanized at the arid top. I just could not penetrate downhill because of this fern. No one has ever collected here before.

Isa & I plan to be at the Bot. Congress in Montreal so as not to become too provincial and out-of-date. The beauty of this trip is that Isa is officially a professional botanist and hence both of us get tax rebates. This is strictly for bot. or professional improvement. We will see you then.

Aloha,

C.H.

WAIALUA, HAWAII, U.S.A. May 8 19 59 No.

WAIALUA BRANCH

BANK OF HAWAII 59-117

PAY TO THE ORDER OF Mrs. Robert Bentz $ 10 no/100

Ten and no/100 DOLLARS

Youth drawing

Otto Degener

No. 1 May 8 1959

Received of Dr. Otto Degener

Ten no/100 Dollars

for drawing of Justicia

Amt. of Account

Amt. Paid

Balance Due

$ 10.- Mrs. Robert Bentz

WESTAB.

May 15, 1959.

Dear Mr. Montagne:

Isa & I are slowly getting things packed for our field trip into Haleakala Crater beginning May 27.

I had all lanterns repaired and here enclose the bill. Just to be on the safe side, particularly as the two helpers are frisky and fool-hardy and we are surrounded by cliffs and ledges, I have taken out liability insurance for each, for the 10 days.

The lantern repair is nasty expensive but if out of order their hauling about would be a waste of time and cash. Dragging them about from place to place is hard on them. Don't be surprised if after this expense, they will again need fixing. The trip in & out of the crater on horseback may mean that the lanterns get banged against projecting rocks and ledges along the trail. During my first trip into the crater in 1927, the horse carrying my crates of kerosene fell over on his back and was bathed in that liquid. But, really, I don't know how it will be this time as the trail may have been beautifully repaired or beautifully washed out since 1927.

I really need more metal corrugations but hesitate to order any because of the expense. Instead of just two blotters and one newspaper of plants between two metals, we will try 4 - 6 blotters.

Isa will go a few days earlier (with her mother) and live at a hotel at her own, not NSF expense. Then she can show her mother the Island of Maui and attend to the ordering of groceries and having everything properly packed for the trip. Then, the same hour I appear by 'plane on Maui, Isa's mother will depart from Maui for the Island of Oahu where we live.

Joe Dawson, the hunky part-Hawaiian policeman and my former protege, goes along for plane fare and keep. I know Koolau Gap. It is a tangle of interwoven and impenetrable staghorn fern up to 4 - 5 ft., high. It kept me from penetrating the area. I expect Dawson and Fleming to hack a trail for us with machetes. To Fleming I mailed a $50 cheque this morning, as a starter perhaps, which you will eventually get canceled. He is to haul with jeep & trailer us and baggage up & down the 10,000 ft. crater, and otherwise help us within. I may also have a retired Board of Agriculture and Forestry man along. He would fly on his own from Oahu to Maui.

We expect pretty good results from this general area.

Aloha,

ATOLL RESEARCH BULLETIN

No. 64

Canton Island, South Pacific
(Resurvey of 1958)

by

Otto Degener and Isa Degener

Issued by

THE PACIFIC SCIENCE BOARD

National Academy of Sciences--National Research Council

Washington, D. C.

May 15, 1959

Atoll

Canton Island, South Pacific
(Resurvey of 1958)

Otto Degener[1] by and Isa Degener[2]

The present paper is based on observations made on Canton Island in February 1958, and resulting recommendations. It chiefly supplements observations made by Degener & Gillaspy on this atoll in 1950-1951, and to get a better perspective of the situation the reader is advised first to study Atoll Research Bulletins 41-43 if he has not already done so. The present survey was made through arrangements with Mr. John M. Beardslee, Regional Administrator, Sixth Region, Civil Aeronautics Administration, Honolulu, Hawaii, aided by Canton residents Dr. Owen King and Mr. Earl King.

CLIMATE

A table of meteorological data was published in Bulletin #41, pp. 7-8, taken from the U. S. Weather Bureau's publication, Local Climatological Data, ... Canton Island, South Pacific, for 1954. More recent editions of this Weather Bureau summary, through 1957, are available from the U. S. Superintendent of Documents, Washington 25, D. C. for 15 cents.

SOILS

It is said that Canton was once so covered with guano that its harvest was long a lucrative export during the latter half of the Nineteenth Century. Even though most of the island has been disturbed by bulldozers, certainly some few areas must have escaped their turmoil as well as that made by the earlier shovels of the guano diggers. Yet, in company of the soil expert Dr. Lyle T. Alexander of the Soil Conservation Service, U. S. D. A., the writers could not find a speck of guano in February 1958. Has wetter weather leached guano out of the soil? Or has the coming of man so decimated the bird population that bird droppings now are washed away by rain faster than they can accumulate on the ground?

A few small groves of trees, growing in a 2 to 4 inch thick loam, occur on Canton. Their probable origin began with a moderate guano deposit stimulating herbaceous plant growth. This resulted in the formation and accumulation of decomposing organic matter. As the soluble material washed out, a blackish soil high in phosphate remained suitable for the survival of trees. One of the soil samples collected yielded 11.4% phosphate on analysis. Perhaps it was such a phosphatic soil that was exploited by the "guano" diggers, rather than true guano.

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[1] New York Botanical Garden.

[2] Formerly Botanisches Museum, Berlin-Dahlem.

Borrowing Dr. Alexander's soil auger, we entered one Messerschmidia grove near the old guano wharf to take soil samples. This was near the lagoon. Here the humus-stained layer was four inches deep, an estimated accumulation of 1,000 years. The second place for samples was a Cordia grove near the British Settlement. This was near the ocean. The humic layer was shallower; the age, less. The samples, mailed to Dr. F. R. Fosberg, were assayed by the Geochemistry and Petrology Branch of the U. S. Geological Survey, Washington 25, D. C. The results are as follows:

Sample 1 (Lab. No. 153526), top horizon in Messerschmidia grove, a dark brown sandy loam with some coral gravel that is somewhat weathered but internally clear white.

Sample 4 (Lab. No. 153527), top horizon in Cordia grove, a dark brown loamy sand with light grains, very weak structure.

Rapid rock analysis by Paul L. D. Elmore and Samuel D. Botts (methods similar to those described in U.S.G.S. Bulletin 1036-C.

	MgO	CaO	Na_2O	K_2O	P_2O_5
Sample 1	1.3	31.0	.26	.03	11.4
Sample 4	2.0	44.6	.44	.02	.72

Quantitative spectrographic analysis by Nola N. Sheffey (in percent on a moisture-free basis. Dried material was ignited at 900° C for 15 min.)

	% Loss on ignition	Cu	Mn	Ni
Sample 1	46.6	.0033	.0006	.0075
Sample 4	47.3	.0018	.0002	<.0002

	Fe	Cr	Sr	Ba	B
Sample 1	.013	.0002	1.2	.002	.010
Sample 4	.004	<.0002	.50	.001	.008

Elements looked for but not found: Mo, Zn, Co.

The above quantitative results have an overall accuracy of ± 15 percent except near limits of detection where only one digit is reported.

In addition to these soil samples, foraminiferal sands were collected and the species identified. They will be reported on in a later paper together with other members of the animal kingdom.

LOCAL LANDMARKS

The SS President Taylor, briefly mentioned in Bull. 41, p. 2, is a prominent, rusting hulk near Musick Light. It still dominates the wreckage-strewn British Settlement. Why the attempt to remove it failed is an interesting tale we owe to Mrs. Betty P. Defibaugh, former postmistress.

The SS Granite State, 10,500 gross tons and an overall length of 522 feet, was launched in 1921. Two years later she was purchased by the Dollar Steamship Line and rechristened SS President Polk. She made about a hundred round-the-world trips during the next five years with passengers and freight. Dec. 5, 1941, when in San Francisco, she was requisitioned by the Government to carry 200 military personnel to Manila, the planned sailing day being December 8. As the attack by Japan on Pearl Harbor intervened, plans were changed. The vessel was rechristened SS President Taylor, quickly remodeled, and sent to Honolulu December 27 with 600 officers and men of the U. S. Tanks Corps. She then returned to San Francisco with Army wives and children.

February 3, with about 1,400 troops and equipment and accompanied by a destroyer, she sailed for Canton Island. As two Japanese submarines caught up with this little convoy near Canton, the President Taylor was ordered to steam close to the atoll. While the destroyer chased the submarines away, the ship ran aground, the troops disembarking the following day, February 15. Various attempts were made to refloat her, the last one in May, without success.

Canton being now an important war base, many of the troops stationed there visited the wreck, helping themselves to whatever they could carry away to make their living quarters ashore more comfortable. The wreck itself remained a pleasant spot to visit until gutted by fire May 1948.

The Caronia, a 300 ton steel pleasure yacht reputed to have cost $750,000 to build in 1927, was taken over by the Navy for the duration of the war. William Cooney, formerly in the Navy, and friends, finally purchased her for a few thousand dollars. They purchased the President Taylor for $5,200 at auction from the U. S. Maritime Commission. Incorporated as "Taylor Salvors," the eleven partners with wives and children to swell the total to 25, sailed on the Caronia for Canton with abundant salvage equipment and with food to last nine months.

The salvagers cut off most of the ship above the waterline to lighten her, and patched the holes in the hull. Thereupon they planned towing her to Japan to sell for about $250,000. But as an irreparable crack in the hull made refloating impossible, they had to be satisfied with salvaging as much metal as possible and selling it on Canton. Expenses just about ate up profits. Then real disaster struck.

The night of July 11, 1956, the barking of dogs aboard the Caronia awakened the six sleepers just in time to enable them to jump overboard and swim ashore. The vessel was ablaze and soon a total loss. Salvage operation of the President Taylor ended, the last

partner forsaking Canton January 1957. Then March 31 the Coast Guard towed the wreck Caronia from the lagoon out to sea and sank her. The SS Granite State, alias President Polk and President Taylor still lies on the reef of Canton.

The old Pan-American World Airways hotel, where the senior writer spent a few days in 1950, has been abandoned. It had become a shambles by 1958.

Canton has improved since 1950-51 in respect to housing for CAA personnel. Many more attractive, modern homes have been built south of the Terminal Building. Some of these are surrounded by well kept gardens; a few by native vegetation and naturalized weeds.

FLORA: SPERMATOPHYTA

Bulletin 41 describes fully the native flowering plants, and lists the plant introductions made in 1950-51. Here we shall note pertinent observations about both categories, arranging the species in taxonomic order. Species which have not materially changed in status since the earlier survey will not be discussed here.

Following instructions from CAA officials in 1950, most of the early introductions were made about the CAA housing area and Terminal Building. Though we were dismayed to see most of these plants with bare, dead stems in February 1958, we were gratified to notice some of them putting forth healthy shoots from the base. The reason was not clear to us until a resident explained that this very area had been thoroughly sprayed; but instead of using the insecticide desired, the workmen in error had used a weed killer!

PANDANACEAE

Pandanus tectorius Park. of the Hawaiians is now represented by quite a number of specimens. All are restricted to gardens, and most probably stem from the 1950-51 introductions.

GRAMINEAE

Cenchrus echinatus R. Br. the sandbur, a terrible nuisance, is ubiquitous as before in areas where man is active. We mention it here because of the strange fact that it has hardly if at all increased its range since 1950-51. Near the plant nursery, now demolished west of the Terminal Building (Bull. 41, p. 39), two plants are killing and displacing this painful weed. Pennisetum setosum, because of its perennial habit, preempts areas where the annual sandbur dies of age, and takes over the ground before the germinated, bur-enclosed seeds can establish themselves. The other beneficial plant is the teaselgourd vine (Cucumis dipsaceus), which simply grows over the sandbur and smothers it to death.

Chloris inflata Link, a fingergrass, conspicuously extends over neighboring vegetation. It is common about the old plant nursery, north of the "native" village inhabited by Gilbert and Ellice Islanders, and about the British Settlement near Musick Light.

Cynodon dactylon (L.) Pers., Bermuda grass, thrives in several patches near the Terminal Building. The beautiful, green lawn existing about the home of a Hawaiian family in 1950 is gone as is its careful tender. He watered it from a brackish well he had sunk in his own garden.

Digitaria henryi Rendle, a 1950-51 introduction, is established and forms small mats in the shade of the coconut trees about the guest house near the lagoon, British Settlement (Deg. & Deg. 24,647).

Digitaria pacifica Stapf, the native bunch-grass, is variable, as mentioned in the previous bulletin. Along the lagoon, north of the native village, is a form (Deg. & Deg. 24,638) that extensively creeps to build up a huge, loose clump about 50 feet across. At the east end of the north Landing Strip, on the other hand, grows a very compact, dwarf specimen. Residents should keep such aberrant plants under observation to determine whether they are merely ecological forms or, instead, genetic ones worth describing.

Digitaria sanguinalis (L.) Scop., crabgrass, if this difficult grass is correctly identified, grows here and there about the nursery area. It is reseeding itself.

Digitaria timorensis (Kunth) Bal. is still growing in the same areas as in 1950-51. Now, however, it is likewise naturalized in dense but localized patches in the plant nursery area (Deg. & Deg. 24,645). Because of its perennial nature, it appears to be crowding out sandbur.

Eragrostis amabilis (L.) W. & A., the feather lovegrass, is a delicate annual thriving here and there about the British Settlement. In the garden of the Terminal Building it forms a dense, tangled lawn, tending to crowd out all other herbs. Just before our departure from Canton in late February 1958, we were amazed to see all this grass being uprooted and hauled away to leave a glaring white surface of coral shingle. Such an area becomes ideal for sandbur to take over. This little garden spot, seen by every voyager, needs a two to three inch covering of screened soil, still quite plentiful near the old guano wharf. Then the area should be mowed regularly every month by a light hand lawn mower, whether it appears to need it or not, the gardener being careful not to let the wheels of the machine cut into the soil. Taller herbs will thus be discouraged from growth and, if the original workmen in February 1958 were not too efficient in eradicating every trace of it, perhaps the lovegrass will establish itself again from random seeds left in the neighborhood.

Eragrostis whitneyi Fosb., the lovegrass named for my young friend, the late Leo Whitney, has perfected a means of racial survival in this sun-scorched atoll by having shortened its life cycle to a scant three or even two weeks. February 1 we discovered a single tiny plant beginning to flower at the swimming hole near the lagoon, northwest side.

By February 16 the species was very common locally, also actually on the Fighter Strip where no other flowering plants could gain a foothold, and here and there on the road at the southeast side. In the latter place it was among blue-green algae (Microcoleus acutissima and a little Schizothrix longiarticulata) that were binding the dusty sand together. This native grass does not grow in rubble, like Lepturus, but in firmly compacted sand and coral fill. Perhaps in such terrain, soil moisture can more easily rise by capillary action to where the shallow roots are located. The life span of this grass is even too short for the scale insect (Antonina graminis (Maskell) det. Miss Amy Suehiro) to grow to maturity about its rootstock.

Lepturus pilgerianus Hansen & Potztal (1954) is of special interest. It is the only annual in the genus. Fosberg states, "The supposed annual habit of L. pilgerianus is especially meaningless to any one who has seen L. repens extensively in the field, as this feature is a purely facultative one, depending on the climate at certain stages in the life of the plants." This is a bold statement, particularly as the critic admits not having seen the type specimen. O. Degener spent a total of ten weeks botanizing on Canton; I. Degener spent three. The Degeners here reaffirm their previous finding that L. pilgerianus is annual. Furthermore, this annual plant differs from the perennial Lepturus growing with it in having culms red-violet not green toward the base, in forming a narrower and less congested tussock or "bunch," in having leaves smooth rather than rough, in lacking obviously the dead culms and leaves of previous years' growth found in the perennial, and in the inflorescences at a distance appearing more conspicuously separate from the rest of the tussock. L. pilgerianus grows on both sides of the lagoon, being especially abundant near the Fighter Strip. Though passage was available for the asking on a Government vessel to neighboring Enderbury Island in February, due to an oversight the writers missed the opportunity of going there to ascertain the possible presence of L. pilgerianus.

Lepturus repens (Forst. f.) R. Br., though recorded from Canton in practically all previous papers, actually does not occur there in the narrow sense (var. repens). The Canton plant is either the variety subulatus, originally described from Ujelang, Marshall Islands and widely distributed in the Pacific, or a variety still undescribed. The Ujelang plant "tends to be stoloniferous," a tendency foreign to the Canton plant.

Panicum distachyum L. (Deg. & Deg. 24,649) is a new record for the atoll. It forms dense mats in the British Settlement. One large clump (Deg. & Deg. 24,656) grows against the ruins of the PAA hotel, in a spot that receives rainwater from the roof.

Panicum miliaceum L., growing near the PAA hotel in 1950 and thought to be derived from spilled birdseed, has disappeared.

Pennisetum setosum (Swartz) L. Rich., introduced in 1950-51, covers an acre or two near the plant nursery to the exclusion of almost every other plant. Clumps occur sporadically elsewhere in the general neighborhood. Largely because of its perennial habit, as already

mentioned under Cenchrus, it crowds out the annual sandbur. Like so many other introductions, Pennisetum has not extended its range extensively. These writers therefore in 1958 gathered many seeds, better termed grains, and scattered them in likely places. This grass and Cucumis dipsaceus (p. 16) vie among themselves as the most valuable introduced sand binders.

Setaria verticillata (L.) Beauv., the bristly foxtail was, next to the sandbur, the most troublesome weed in 1950-51. It was everywhere near human activity, the coarsely hairy, fruiting inflorescences tangling themselves in socks and stockings of anyone straying from the center of a pavement. But during a three weeks' stay on Canton in February 1958 the writers found only two or three clumps. One of these was about a box of garbage that had been dumped on the roadside northwest of Turtle Beach. We do not know why this annoying weed has suddenly almost disappeared.

Tricholaena rosea Nees, Natal grass, is now naturalized widely in the nursery regioh, about where it was first introduced in 1950-51.

CYPERACEAE

Cyperus javanicus Houtt., introduced in 1950-51, grows well in clumps between the nursery and the ocean (Deg. & Deg. 24,650).

Cyperus polystachyos Rottb. (Deg. & Deg. 24,655) grows in several clumps in the shade of coconut trees near the lagoon about the British Settlement. It is a welcome addition to the local flora, not recorded before.

Cyperus rotundus L., the nutgrass, still grows about the old PAA hotel site; now also about the Terminal Building.

Fimbristylis dichotoma (L.) Vahl, growing in 1950-51 near the outdoor theater of the time, south of the British Settlement; and F. pycnocephala Hbd. growing on a barren plain near the CAA housing area of the same time, are still there. By 1958 they had spread to the northwestern part of the atoll, conspicuous and valuable sand binders of open areas everywhere. The latter resembles a coarse pincushion. The two species often grow together, and we noticed evidence of hybridization.

ARECACEAE (PALMAE)

Cocos nucifera L., the coconut, now grows abundantly in gardens. Many are given a little care and hence are thriving. Only one tree, however, is now old enough to begin bearing. The healthiest trees, even though infested with scale, are in Dr. King's garden. They had been set in pani or depressions below the surface of the ground, holes dug deep enough to penetrate the hardpan. They were surrounded by large slabs of limestone tipped so as to lead an unusual supply of water to them at every rain, and were occasionally supplied with a little water left over after household use. This last treat will be hardly necessary after the roots have penetrated to near the brackish ground water table.

Phoenix dactylifera L., the date palm, was considered such a valuable food plant in case of emergency on Canton that thousands of its seeds were scattered in 1950. Many germinated and Dr. S. G. Ross set out a score or so seedlings about his hospital in 1951 south of the British Settlement. In 1958 only two small date palms were growing on Canton, cultivated in a garden.

COMMELINACEAE

Rhoeo spathacea (Sw.) Stearn, the white-flowered tradescantia or "oyster plant," was introduced in 1950-51. It grows well in some gardens.

Setcreasea purpurea B. K. Boom is cultivated about one home, and doing well.

LILIACEAE

Sansevieria cylindrica Bojer and its relative S. guineensis (Jacq.) Willd. introduced in 1950-51 are planted in gardens. None has become naturalized.

AMARYLLIDACEAE

Crinum asiaticum L., or a species thus called in Hawaii and elsewhere, is planted commonly about homes. It is often grown crowded together, although it needs to be thinned to individual plants to get best results.

Furcraea foetida (L.) Haworth, incorrectly listed as F. gigantea in Bull. 41 and by botanists in general, was introduced in 1950-51. It is growing in a few gardens.

MUSACEAE

Musa nana Lour., the Chinese banana, was cultivated in a few gardens in 1958 to the exclusion of other kinds also grown in 1950-51.

CASUARINACEAE

Casuarina equisetifolia L. and C. glauca Sieb. are both thriving without care, the latter increasing its area slightly by producing from its spreading roots adventitious buds that grow into new trees.

POLYGONACEAE

Coccoloba uvifera (L.) L., the seagrape, was already growing and fruiting about the PAA hotel in 1950. But as Degener had a thriving tree in his garden at Mokuleia Beach, Oahu, he gathered the abundant seeds fallen on clean sand. This was more practicable than searching for and gathering the few that fell among sandbur and foxtail under the Canton Atoll trees. The Oahu seeds were planted on Canton. By 1958, the old original seagrape trees had formed a beautiful, small shady grove about the hotel grounds. Ripening fruit was everywhere, and "native" urchins were gathering them into tin cans as a source of food. The trees were reseeding themselves and can furnish sufficient seedlings to form shaded roadsides

and gardens throughout the atoll if given a minimum of care. Volunteer seedlings, if left under the old trees die within a few years. Seed scattered about by Degener in 1951 had grown into a few low, spreading bushes about the bird refuge, and those planted south of the housing area were healthy and thriving. A few were planted at the Gillaspy home and, according to reports, were six feet tall in 1958 before they were uprooted and discarded by a new resident.

AMARANTHACEAE

Amaranthus dubius Mart. was not observed during our 1958 stay.

AIZOACEAE

Sesuvium portulacastrum var. griseum, first described by Degener & Fosberg as new from Canton, is still growing in the same areas as before. But in 1958 at the Dock a patch of the species, var. portulacastrum. (Deg. & Deg. 24, 651) was found naturalized. It is obviously of recent accidental introduction, seeds presumably reaching this spot with shipping. The difference between the slender, red-stemmed, red-flowered, glossy, terete-leaved var. portulacastrum and the stocky, yellow-stemmed, pale-flowering, dull, angular-leaved variety griseum is striking when the two grow side by side.

PORTULACACEAE

Portulaca cyanosperma Egler, a Hawaiian purslane with pretty violet-red flowers, was introduced in 1950-51. Mr. & Mrs. Albert Lincoln reported the former occurrence of large mats of this succulent near Turtle Beach, northeast side of Canton. They transplanted some to their garden near the lagoon where the writers happened to see it and its escaping offspring. A visit to the former Turtle Beach stand disclosed that waves of a recent, severe storm had washed over this area, sweeping all vegetation in their path, except Suriana, into the lagoon.

CARYOPHYLLACEAE

Spergularia marina (L.) Griseb., a pale, fleshy halophyte (Deg. & Deg. 24,612), was collected on Johnston Island January 30, 1958. Its seeds were scattered about the new hospital in the CAA housing area on Canton a few days later.

CASSYTHACEAE

Cassytha filiformis L., the love-vine, is native to Canton. It now covers like a huge greenish throw-net several acres near the Shark Pool, parasitizing Portulaca lutea, Boerhavia and Sida.

CRUCIFERAE

Lepidium o-waihiense Cham. & Schlecht., introduced from Oahu in 1950-51, is surprisingly abundant (Deg. & Deg. 24,636) and even crowded in 1958 on part of the elevated side of the causeway south of the "native" village. The writers gathered several handfuls of seeds to scatter in other likely places.

CRASSULACEAE

Bryophyllum pinnatum (Lam.) Kurz, the air-plant so famous for producing plantlets from notches in its leaf even when the latter is pinned on a window curtain, is now growing in a few gardens. It has not escaped, but should be encouraged to do so.

LEGUMINOSAE

Desmanthus virgatus (L.) Willd., the slender acuan, was introduced in 1950-51. Numerous branches of this shrub stand stiffly upright about the nursery area, killed by the weed spray. Luckily two or three root-stocks survived the poison, and in February 1958 bore flowering branches.

Leucaena glauca (L.) Benth. (haole koa in Hawaii) was already represented by a few fruiting plants in 1950 at the PAA hotel entrance. Degener in 1950-51 introduced many seeds. Now this plant is sparsely reseeding itself about the British Settlement, and fairly well in the nursery area, even though recently exposed to the weed spray.

Prosopis chilensis (Molina) Stuntz, the algaroba, is a shallow-rooted tree related to the deep-rooted mesquite of the southwestern part of the United States and northwestern Mexico. As stated previously (Bull. 41, p. 33), the Degener-Gillaspy policy was to introduce no plants that might be poisonous or painfully thorny "such as the . . . algaroba (Prosopis chilensis)". Nevertheless, in 1958 we were pleased to see a dainty algaroba growing in a flower pot on a resident's porch. There is a vast difference between algarobas growing under proper confinement and such trees growing wild to scatter their cruelly efficient thorns where such a large proportion of the population goes barefoot.

EUPHORBIACEAE

Acalypha wilkesiana M. -A., the painted copperleaf, had disappeared by 1958, but the three Chamaesyce species were as common as before. They had not materially extended their range.

Phyllanthus "niruri", "growing in 1951 in and about a box of soil imported from Fiji," had established itself about the British Settlement, but was rare in 1958. When this specimen (Deg. & Deg. 24,646) is studied further it will probably be shown to be another species, as according to G. L. Webster (1956) P. niruri L. though widely reported, does not occur in the Pacific Islands.

Poinsettia cyathophora (Murr.) Kl. & Garcke), the fiddle-leaved poinsettia, in 1950 was sparingly naturalized and protected in the British Settlement; but not observed elsewhere. In 1958 this modest ornamental was growing wild and common in the housing area. When the plants flower, thirsty flies and other insects are attracted to the nectar. Some housewives therefore keep the plants from growing near their homes. The garden poinsettia (P. pulcherrima (Willd.) Graham) was nowhere to be seen. It is worth introducing again as a garden plant.

ANACARDIACEAE

Schinus terebinthifolius Raddi, the Christmasberry tree, is represented by a small healthy plant in a garden near the airport.

MALVACEAE

Gossypium brasiliense Macf., the kidney-cotton of commerce, was introduced in 1950-51 about the CAA housing area. Several years later it was abundant, and conspicuous with its untidily spilling seeds and white lint. After the disastrous spraying of the area with weed killer, this choice ground cover was killed except for a few score plants. These were producing their crop of cotton in 1958, and some of the seeds were planted at that time. The endemic Hawaiian cotton (G. tomentosum), likewise introduced in 1950-51, is nowhere to be seen.

Hibiscus rosa-sinensis L., the common Chinese hibiscus, is growing in a few gardens as before. The plants are chlorotic.

Pariti tiliaceum (L.) Britton (hau in Hawaii) was already on Canton when Degener introduced many seeds from Oahu in 1950-51. In 1958 the tree was rarer than before; the old one at Musick Light still lives.

Sida fallax Walp. is almost everywhere as before. Near the garbage dump south of the housing area grows a freak bush with almost white flowers.

Thespesia populnea (L.) Sol. (milo in Hawaii) still grows on Canton. In spite of the numerous seeds introduced in 1950-51, it is represented by only a few more individuals in 1958.

CLUSIACEAE (GUTTIFERAE)

Calophyllum inophyllum L. (kamani in Hawaii) was already on the island before Degener imported seeds and potted plants in 1950-51. The old trees of 1950 about the PAA hotel are growing well.

TAMARICACEAE

Tamarix aphylla Karst., the European tamarix, is represented by the same beautiful, large trees that were growing about the hotel in 1950. Cuttings from Oahu set out by Degener in 1950 about the Weather Station had been accidentally killed by the weed killer except for one tree that has become ten feet tall. This represents a growth of almost one foot per year.

PASSIFLORACEAE

Passiflora foetida L., the foetid passionflower, was represented by a single plant in 1950 before Degener introduced and scattered hundreds of seeds. In 1958 it was naturalized about the plant nursery and British Settlement. The long vines are flowering, bearing their edible fruit, and reseeding themselves.

CARICACEAE

Carica papaya L., the papaya, was planted as before without following the writer's suggestions of adding humus in the soil about it (Bull. 41, p.26). As expected, the trees were chlorotic and non-fruiting.

COMBRETACEAE

Conocarpus erecta L., introduced in both the glabrous and silvery varieties by Degener in 1950-51, are beautiful shrubby trees in the Terminal Building garden. The ground under the trees is covered with seedlings available for replanting. They have not been used and gradually die due to competition with the parent plants.

Terminalia catappa L., the Indian almond, was already on Canton when Degener introduced seeds and seedlings in 1950-51. The Degener introductions were nowhere to be seen in 1958, whereas the old trees of 1950 about the PAA hotel are not only growing well but reseeding themselves. Young plants up to a foot high are under the old ones just waiting to be transplanted.

ARALIACEAE

Polyscias guilfoylei (Bull) L. H. Bailey, the panax of Hawaiian residents, is now growing in a garden or two in the housing area.

APOCYNACEAE

Plumeria rubra L., the frangipani, was introduced in a cultivated form previous to 1950, and died that year due to scale insects. Offspring of wild trees originally gathered in the Bahamas by Degener and planted by him on Canton in 1950-51 have disappeared. These bore small, white flowers. A single plant of a cultivated form, obviously recently introduced, now grows in a garden.

Calotropis gigantea (L.) Ait. and its white-flowered form wilderi Degener, the crown flowers, are grown with success in both the British Settlement and the CAA residential area. As these milkweed are host for the caterpillar of the monarch butterfly, some residents destroy their plants rather than bother to kill the insect with a spray or by hand picking. We are not certain whether the lavender crownflowers in gardens come from cuttings imported in 1950-51 or are from the ancient bush still growing between Musick Light and the wrecked "President Taylor."

The variety wilderi, in the original description by the senior writer in 1937, was stated to have been introduced into the Hawaiian Islands "by Gerrit Wilder 'from Tahiti, where he found it, growing in the garden of Robert Keable, writer.'" More recent evidence indicates that Wilder erred in claiming he had first introduced this plant into Hawaii. It had been growing there years before his introduction. Whether it originated in the Hawaiian Islands, Tahiti or elsewhere is still an open question.

CONVOLVULACEAE

Ipomoea tuba, which was not identified with certainty in Bulletin 41, p. 27, is a correct scientific name for the native moonflower. This twiner is represented by the same old plants observed in 1950-51 along the northeastern rim. It has not spread of its own accord since that time. The few seeds lying about the dormant plants in 1950-51 were gathered and planted about the CAA housing area. It was refreshing to see this night-bloomer cover now almost an acre of rubble where the two Landing Strips meet, and to see a patch a hundred feet wide covering Sesuvium just south of the housing area. A few moonflowers are being successfully trained on trellises. The plant is beautiful at night with its large, gleaming white flowers facing the stars overhead.

Ipomoea batatas (L.) Poir., the sweet potato, was observed in 1958 planted in the open in the housing area. It thrives except for chlorosis.

Ipomoea pes-caprae (L.) Roth, the beach morning-glory, frequently recorded from Canton, is probably represented only by the subspecies brasiliensis. We do not know whether we should classify it as native or introduced; it is a borderline case. So far as its seeds drift to Canton and germinate there, it is a native. But due to the terrestrial hermit-crab (Coenobita perlatus), such plants never survive. We now believe the only plants able to mature receive some human protection. In this sense, the beach morning-glory must be classed as introduced. In February 1958, hundreds of thousands of beach morning-glory seeds were seen washed up in an almost solid line along the north shore of Canton. With several other species of various families, they germinated well enough to mark a thin greenish line along the beach. The characteristically shaped cotyledons were soon devoured and not a seedling was observed with normal, goat-footprint leaves. Yet about the hotel area and CAA housing area, where Degener planted Oahu seeds in 1950-51, the vine was common, covering the ground with its long, flowering, creeping stems. These even covered the bare floors of the large Quonset huts near the lagoon beach. Though a prostrate creeper, not a high twiner like the moonflower, the slender stems were successfully trained by some residents over fences near the Terminal Building to produce a truly charming effect.

BORAGINACEAE

Cordia sebestena L., the geigertree, thrives in spite of neglect in the old PAA hotel grounds. Its roots, like probably those of all the various kinds of older trees in the vicinity, may have reached to near the watertable. There, one must remember, the water is but mildly brackish. The ground under the geigertrees is covered with healthy seedlings, material that could be nicely planted in gardens and along the roads of the CAA housing area.

Cordia subcordata Lam. (kou in Hawaii) may be native according to some evidence; originally introduced by man according to other. For example, during our rather thorough search for drift material we failed to find a single kou fruit, notwithstanding that they are corky and hence admirably suited for ocean transport. About the present kou groves, where hermitcrabs congregate mainly to enjoy the shade, the seeds

readily germinate but the writers have yet to find a single one escape crab destruction to grow to maturity. The opportunity for a rare seed during the atoll's life-time to reach a favorable spot, to be covered with sand and germinate, and finally to mature in spite of hungry crabs is entirely possible but unlikely. Furthermore, clusters of kou trees about the old guano wharf "are said to have been planted years ago (Bull. 41, p. 28)." That leaves the two groves, less than one mile south of Musick Light, to consider. The one covers about 3500 square feet and the other about 2700 (Bull. 43, p. 3). The soil in the former, according to Dr. Alexander's estimate to us on the spot, is several hundred years old. Do these old kou groves, each probably derived from a single fruit, represent an introduction several hundred years ago by ocean currents or by early Pacific Islanders, perhaps those who may have erected coral rock edifices (Bull. 41, p.6)?

Even though the kou was already there, Degener shipped a large quantity of fruits from his Mokuleia Beach, Oahu, trees to Canton in 1950-51 to add to fruits gathered by him locally. Then while hunting for and studying specimens south of the housing area, he was wont to wander over the area, a shovel in the right hand, and a pail with vials, killing bottle, flask of water and kou fruits in his left. At various spots he thrust his shovel a few inches into the friable soil, moved it back and forth a few times, threw a small handful of fruits in the gaping hole, and tamped the soil about them. In 1958, the landscape, thanks to this early planting, was dominated by vigorous clumps of kou trees, each about six feet tall and seven or eight years old. The very minimum care in planting combined with isolation, that made it difficult for crabs to find everyone of the thousands of tasty seedlings, was sufficient to establish groves of this tree. Defoliation by caterpillars, an ugly nuisance to which all kou are presently subject, will be lessened thanks to Territorial Entomologist G. C. Chock of Honolulu. He is preparing to ship the proper parasite for control.

VERBENACEAE

Stachytarpheta jamaicensis Vahl, called oi in Hawaiian, is native to tropical America. The small quantity of seed available was scattered in 1951 mainly about Degener's cottage near the lagoon south of the PAA hotel. In 1958 the oi was locally abundant and naturalized. The only other station observed that year was at the garbage dump, south of the CAA housing area. This consisted of a single large plant, in that area decidedly ornamental with its pale lavender flowers. Because of their contrast against a field of yellow Sida, its scanty sprays were being picked for ornament. Its popularity may yet cause its death. At the abandoned cottage, on the other hand, the plants can continue to blossom and reseed themselves undisturbed.

SOLANACEAE

Capsicum frutescens L., the common redpepper often called "Chili pepper," is more than holding its own in a garden.

Lycopersicum esculentum var. commune Bailey, the common tomato, was evidently recently introduced and thriving in a garden. L. esculentum subsp. galeni (Mill.) Buckwill, a wild tomato with small fruits naturalized on Oahu, was hopefully introduced in 1950-51. Not a single plant was to be seen in 1958. "Lycopersicon esculentum var.", collected near the Airport by Degener & Hatheway (No. 21,307) in 1950, was likewise gone. It resembles a plant from the Galapagos (Alban Stewart No. 3,380), and like it is a straight variant of L. esculentum.

Nicotiana glauca R. Grab., the tree tobacco, already in Canton in 1950, was reintroduced by Degener the following year. In 1958 one huge plant, a respectable tree, grew in a depression north of the north Landing Strip close to the ocean. It had been badly mauled by a storm, but was recuperating well from its injuries. It had reseeded itself prolifically during the past years, and the younger plants, likewise injured during the same storm, were likewise growing lustily. Other plants growing elsewhere often become chlorotic.

Petunia hybrida Nilm, the common garden petunia, grows nicely in a window-box. Such prized plants almost always receive a little care, some water left over after rinsing a vegetable or the dishes, perhaps even a little commercial fertilizer. Such ornamentals are well worth growing, but hardly can be expected to escape into the wide open spaces where such little extra care is denied them.

Physalis angulata L., the husk tomato, is found, as in 1950, sparingly naturalized at the British Settlement. This time it has spread to the Terminal Building garden. Here the plants suffer from the attacks of red spiders.

Solanum melongena var. esculentum Nees, the eggplant, grows in a garden. It promises a crop.

RUBIACEAE

Casasia clusiifolia (Jacq.) Urban, perhaps best named the Bahama gardenia, was introduced as small plants in 1950-51. Seeds, collected by Degener many years ago along the arid coral coast of New Providence, British West Indies, were sent to Colin Potter, custodian of Foster Botanical Gardens, Honolulu, for cultivation and distribution. In 1951 Mr. Potter kindly donated some healthy, six-inch plants for Canton, which were forthwith set out at the Terminal Building. In 1958, though somewhat infested with scale insects, the Bahama gardenias had developed into beautiful compact shrubs, three to four feet high, with dark, glossy leaves and sweetly fragrant, gardenia-like flowers. Even the large orange fruit, edible in an emergency, was setting but we do not know whether its seeds will be viable. This ornamental evergreen is highly recommended for planting in local gardens.

Morinda citrifolia L., (noni in Hawaii) was known to Degener in 1950 by a single large tree near the old guano wharf. It had disappeared by 1958. At that time, however, a large, but dilapidated tree was growing in the "native" village and, according to a Gilbertese, several more were growing east of the north Landing Strip. The variegated var. potteri Degener, introduced by Degener originally from Viti Levu, Fiji, planted in 1950-51, was nowhere observed.

CUCURBITACEAE

Citrullus vulgaris Schrad., the watermelon, was planted in one garden.

Cucumis dipsaceus Ehrenb., the teaselgourd of Arabia, was introduced in 1950-51. At the old nursery in 1958 it had covered one area 50 feet across, and was growing in several more places in the vicinity. In the former locality this vine formed a luxuriant, densely leafy ground-cover, smothering out every other plant in the area, including the obnoxious sandbur (p. 4). The ground was covered with golden yellow gourds, many of which were gathered, sliced and scattered in likely places. Though this interesting plant finds Canton to its liking, it seems not to spread much farther than its slender extending vines can drop their seed-filled gourds upon the ground. An efficient animal for proper seed-dispersal is wanting. Grown for ornament and curiosity in many lands, it is strange no island resident has trained the teaselgourd over fences and trelisses like the moonflower and the less adapted beach morning-glory.

Cucumis melo L., the muskmelon, thrives in one garden, the vines covered with unripe melons two to three inches in diameter. Even if they do not ripen, they can be made into a conserve or pickle. According to Mr. Beardslee, many ripened.

GOODENIACEAE

Scaevola, the naupaka of Hawaiians, consisted of two kinds of plants on Canton in 1958: the native one, common almost everywhere; and the Hawaiian one, consisting of less than a dozen plants derived from Oahu seeds scattered in 1950-51. To have these two kinds growing together under identical conditions was ideal for their comparison and study. The Canton plant becomes ten feet tall; has glossy, hairless leaves; and white flowers in which the corolla lobes are marginally narrow-winged and slightly fimbriate. The Hawaiian plant, on the contrary, rarely attains half that height; has finely velvety leaves; and white to more or less lavender flowers in which the corolla lobes are marginally broader-winged and more prominently fimbriate. Residents of Canton, without any botanical knowledge, had noticed the difference between the two even before our arrival from Honolulu.

The coastal species of Scaevola on Canton and other Pacific Islands has white fruit and has most often been called S. frutescens (Mill.) Krause. Fosberg (1956) has demonstrated that this name can be applied only to the Atlantic coast Scaevola with black fruit, which the writer knows well from Bermuda and the Bahamas. Fosberg concluded that the only name available for the Pacific species is Scaevola sericea Vahl (Symb. Bot. 2: 37, 1791). This was described from Niue (Savage Island) east of Tonga and the name can best be translated as silky scaevola. While the Canton plant is nowhere silky, we tentatively call it S. sericea until further studies determine whether another name is necessary.

The common Hawaiian plant has been called variously S. lobelia, S. frutescens, S. frutescens var. sericea and S. fauriei. We know it cannot bear any of the three first names. We likewise believe it is not sufficiently distinct from the Niue plant to have a specific name of its own. We therefore (Phytologia 6(6): 321, 1958) named the Hawaiian plant Scaevola sericea var. fauriei Degener & Degener.

Now that two related naupaka grow on Canton, it will be interesting to note whether they will hybridize.

COMPOSITAE

Conyza canadensis (L.) Cronq. (Deg. & Deg. 24,961) is represented by about a dozen plants. These grow about a warehouse southwest of the Terminal Building, mostly under the eaves of the roof, perhaps because of the additional water that occasionally drips from them. This plant is new for Canton, an accidental introduction.

Gaillardia picta Sweet, a variable form of hybrid origin naturalized on dunes about Laie, Oahu, was sown around the Terminal Building in 1950. In 1951 several plants had already flowered, most of them under the eaves of old shacks. In 1958 the shacks were gone, and the Gaillardia as well. With a little care, this ornamental would reward the gardener with an abundance of pretty flowers varying from yellow to orange-red.

Pluchea indica (L.) Less. , the Indian pluchea, was introduced in 1950-51. It is thriving and common about the Turning Basin. It now grows among its coarser, grayer relative P. odorata (L.) Cass.

Tagetes sp., the marigold, was observed cultivated in a window box.

CYANOPHYTA[1/]

Cyanophyta (Myxophyceae, Cyanophyceae) commonly called blue-green algae because of their prevailing color, are extremely important in keeping the sand and the coral dust of Canton Island from blowing away.

Some "blue-greens" form a felt-like covering near the surface of the soil; some cover the soil with a gelatinous matrix; others evidently combine with bacteria to form a thin layer of stone; while still others are apparently of no value at all as soil binders. When Canton suffers from an exceptionally long drought, some of the felt-like blue-green algae curl up in leaf-like flakes and eventually may crumble into dust, thus exposing the loose sand and soil as well as themselves to wind erosion.

Of course a ship or plane may have unwittingly transported different kinds of blue-greens from one island to another. Perhaps because of such agency of man, Entophysalis deusta and Microcoleus

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1/ Remaining groups of algae in the Degener Collection are described by E. Yale Dawson as Bull. 65.

chthonoplastes were collected on both Canton Atoll and Johnston Island (Deg. & Deg. 24,580 and 24,580a, Jan. 30, 1958). The consensus of botanists, however, is that such microscopic organisms are readily transported even by high air currents throughout the world. To be wafted from Canton to Johnston or vice-versa is not a difficult feat, one that probably occurred time and time again. Many blue-greens are capable of survival on sun-scorched rocks, as found on Canton, on the Equator; and in the thermal springs, as in Yellowstone and New Zealand. Such plants are likewise capable of survival and growth in frigid regions.

Thanks to Dr. Francis Drouet's efficient advice on the collecting of Cyanophyta received before our February 1958 stay on Canton and thanks to his expert determinations, we have the following to report:

CHROOCOCCACEAE

Anacystis aeruginosa (Zanard.) Drouet & Daily (Deg. & Deg. 24,744).

Anacystis dimidiata (Kütz.) Dr. & Daily (Deg. & Deg. 24,584, Feb. 16, 1958), with Entophysalis deusta, was found along the southeast beach of the lagoon in shallow water gently rippled by wave action. It imparted to the fine, almost muddy, white sand, a pale pea-green color. Mixed with Johannesbaptistia pellucida and Lyngbya aestuarii which see.

Anacystis montana (Lightf.) Dr. & Daily (Deg. & Deg. 24,571, Feb. 3, 1958) occurred as a thin mat about one mile east of the Fighter Strip along the wet edge of a more or less permanent shallow, narrow pond. Various kinds of fish must have washed over the beach into this pond during severe storms but we found only mullet. The reason they could survive while the others did not was evident on tasting the water. It was almost fresh.

Johannesbaptistia pellucida (Dick.) W. R. Taylor & Dr. (Deg. & Deg. 24,573, Feb. 8, 1958), commixed with Entophysalis deusta, Anacystis dimidiata and Plectonema terebrans, formed an almost black blue-green mass at the bottom of a fresh-water pond behind the beach near the Messerschmidia woodland shown on Hatheway's map (Bull. 43) near the center of the north shore.

CHAMAESIPHONACEAE

Entophysalis deusta (Menegh.) Dr. & Daily (Deg. & Deg. 24,594, Feb., 1958) is the microscopic plant that by its astronomical numbers imparts to the atoll a dark grayish somberness excepting where displaced by the green of other vegetation, the gleaming pale yellow to pink of the beach sand, the white of wave-worn coral slabs, and the indescribable pale greens to aquamarine blues of lagoon and ocean. This so-called blue-green alga covers the upper surface of coral slabs, barely penetrating beyond superficial interstices. Though useful in cutting down the glare of the otherwise alabaster-white coral rock, no one has yet worked out to what extent its absorption of the sun's rays raises the temperature of its surroundings. Considering the climate, these primitive plants are sun-scorched and dormant most of the time, springing

into life during occasional rains and ocean mists; or at night when much of the atoll is covered by a film of moisture readily formed on surfaces impregnated with ocean salts. This same plant, in conjunction with bacteria on and about decaying plant and animal debris, formed a firm 8 mm.. thick crust about a drying, brackish pool on Spam Island (Deg. & Deg. 24,593, Feb. 19, 1958). Even an arid undermined ledge of limestone overhanging the lagoon bore this persistent, difficult-to-kill plant on both its surfaces (Deg. & Deg. 24,568, Feb. 8, 1958). It (Deg. & Deg. 24,564, Feb. 14, 1958) even blackened the limestone bottom of a drying, shallow arm of the lagoon six miles east of the Fighter Strip. It is almost everywhere, and hence it would be repetitious to list all our collections.

To realize fully the frequency and island-wide distribution in various habitats of this species, it is merely necessary to peruse the paragraphs below concerning other species and to learn that E. deusta was growing with many of them.

OSCILLATORIACEAE

Hydrocoleum comoides (Harv.) Gom. (Deg. & Deg. 24,918, Feb. 1958) was found on the lagoon side east of the north Landing Strip. For another collection (Deg. & Deg. 24,576a, Feb. 3, 1958) see under H. glutinosum of same number.

Hydrocoleum confluens (Setch. & Gardn.) Dr. (Deg. & Deg. 24,727, Feb. 2, 1958) grew on reef rocks, in shallow water at low tide, northwest of the Gilbert-Ellice Village.

Hydrocoleum glutinosum (Ag.) Gom. (Deg. & Deg. 24,578, Feb. 2, 1958) stained patches of muddy sand a light green. This was common on the ocean reef, shallow at low tide, southwest of the Terminal Building. The same species (Deg. & Deg. 24,576, Feb. 3, 1958) and some H. comoides were collected about 10,000 feet east of the northwest tip of Canton. Here on the ocean side is a limestone reef so flat and smooth as to remind one of a concrete sidewalk. In many areas a very fine white sand with a light bluish green color covered this rock to a depth of about one centimeter. Instead of being washed away by the waves of the open ocean, this sand remained, probably held in place by the gelatinous secretion of H. glutinosum and the less abundant H. comoides.

Hydrocoleum lyngbyaceum Kütz. (Deg. & Deg. 24,916, Feb. 18, 1958) grew on the ocean reef, south shore, in company with the former species; and (Deg. & Deg. 24,785, Feb. 6, 1958) with Spirulina tenerrima Kütz.

Lyngbya aestuarii (Mert.) Liebm. (Deg. & Deg. 24,577, Feb. 7, 1958) occurred for a depth of half a centimeter or less in the calcareous sandy mud exposed at low tide along the artificial channel southwest of the Turning Basin. Another collection (Deg. & Deg. 24,583, Feb. 14, 1958) was made six miles east of the Fighter Strip in a fresh to brackish water puddle, slowly drying out. This Lyngbya, with an admixture of Entophysalis deusta, covered the area with a dark bluish green, somewhat gelatinous mat a few millimeters thick. With Anacystis dimidiata, it (Deg. & Deg. 24,565, Feb. 18, 1958) formed a

very dark blue-green covering over the bottom of a slightly saline, shallow pool on the lagoon side of the southeastern tip of Canton. Regarding still another find of L. aestuarii (Deg. & Deg. 24,592a, Feb. 19, 1958) see Phormidium gardnerianum.

Lyngbya confervoides Ag. (Deg. & Deg. 24,770, Feb. 17, 1958) grows on old coral on the ocean reef, shallow at low tide. The spot is on the south side, two miles east of the Kou forest.

Lyngbya infixa Fremy (Deg. & Deg. 24,745) on L. majuscula (Dillw.) Harv.

Lyngbya majuscula (Dillw.) Harv. (Deg. & Deg. 24,749).

Lyngbya semiplena (Ag.) J. Ag. (Deg. & Deg. 24,575, Feb. 5, 1958) grew along the north shore, quite a distance inland from the beach. Though exposed to full sunlight, it bound the sand together for a thickness of three to five millimeters. A quite different habitat for this species (Deg. & Deg. 24,917, Feb. 8, 1958) was old coral forming the submerged part of the guano wharf in the lagoon. At the bird reservation, on the other hand, it (Deg. & Deg. 24,775, Feb. 16, 1958) formed a thin brown film on that part of the ocean reef that is partly exposed at low tide.

Microcoleus acutissima Gardn. (Deg. & Deg. 24,579, Feb. 14, 1958) with Schizothrix longiarticulata, grew on the flat bulldozed rubble surface of the Fighter Strip, to some extent inhibiting the formation of dust clouds. In part of this area, among the alga, grew the native dwarf lovegrass, Eragrostis whitneyi.

Microcoleus chthonoplastes (Fl. Dan.) Thur. (Deg. & Deg. 24,597, Feb. 13, 1958), with Entophysalis deusta, was collected at the southeast end of the lagoon. At low tide these extensive mudflats, here and there inhabited by colonies of gaudy fiddlercrabs (Uca tetragonon), are sun-baked and occasionally even entirely dried. Here one or both of these blue-green algae, perhaps in conjunction with bacteria, form a stiff, brittle crust of rock about one millimeter thick. One mile west of Shark Pool, southeast tip of Canton, M. chthonoplastes (Deg. & Deg. 24,581, Feb. 15, 1958) formed a hard crust of the surface mud of a drying fresh-water puddle. For another collection (Deg. & Deg. 24,572a, Feb. 2, 1958), see Scytonema hofmannii.

Microcoleus paludosus (Degener 21,341; reported in Bull. 41, p. 40, is a misidentification for M. chthonoplastes, mentioned above.

Microcoleus tenerrimus Gom. (Deg. & Deg. 24,595, Feb. 1, 1958). On the coral slabs cast up onto dry land by storm waves and there left to rest undisturbed for many months and even years, the dark Entophysalis deusta thrives, as described in detail under that species. Nearer the beach, however, are similar coral slabs, somewhat more often tumbled about by wave action and hence alabaster-white. Such flat stones, because of their coral origin, are translucent and of course more or less porous, the degree depending upon the precise species of animal. Due to the intensity and the drying effect of the sun, perhaps the upper nine-tenths or even more of the slab is relatively devoid of

plant life. But the remaining area, as in a greenhouse or fernery, supplies an environment of diffuse light and relatively constant moisture, particularly if lying on moist sea sand. For this reason it is a pleasant pale green. An occasional cuttle-bone, the inside shell of the cuttle-fish, lies among such coral. As it has the same general appearance, we suspected it to be a similar locus for the growth of Cyanophyta. Stone-like coral being difficult to handle, we sent the cuttle-bone to Dr. Drouet for dissection. Here he found Microcoleus tenerrimus, Plectonema terebrans, Entophysalis deusta and some Calothrix crustacea.

Phormidium gardnerianum Dr. (Deg. & Deg. 24,592, Feb. 19, 1958), with Lyngbya aestuarii, colored spinach-green most of the bottom of a brackish pool on Spam Island.

Phormidium papyraceum (Ag.) Gom. (Deg. & Deg. 24,592, Feb. 19, 1958), associated with Nodularia sphaerocarpa and Plectonema nostocorum, was collected about a mile east of the Landing Strip, northern Canton. Here the Armed Forces during the Second World War had constructed a cement trough three by six feet in area and a few feet deep. This was permanently rain-filled and here P. papyraceum formed dark, paper-thin, blue green pellicles more or less attached to the trough sides. Among this well-named alga lived the bloodred larva of the midge Tendipes esakii, originally described from Saipan.

Porphyrosiphon fuscus Gom. (Deg. & Deg. 24,598a, Feb. 11, 1958), see Schizothrix lamyi.

Schizothrix creswellii Harv. (Deg. & Deg. 24,574, Feb. 8, 1958). Tridacna shells are everywhere; but the living mollusks, standing upright above the general surface of the water shallow at low tide, are rather localized. The shells are agape, exposing to the sun their voluminous mantles which are of strikingly beautiful pastel shades, almost gleaming in the sun. These vary from purples and dark browns to yellows, greens and blues. It is reliably reported that the unusual color of the mantle is caused by microscopic blue-green algae living in symbiotic, almost captive, relationship, with the tridacna. We killed no tridacna for samples of blue-greens; living tridacna we knew only from the ocean reef. Then Mr. & Mrs. Albert Lincoln brought us to an unusual stand of these living baptismal fonts, located in shallow water in the lagoon, about 16,000 feet east of the northwest end. Along the muddy bottom was a rusting pipe, its surface as though whitewashed. This encrustation was pale green with S. cresswellii. The species (Deg. & Deg. 24,910, Feb. 1958) likewise impregnated a cuttle-bone lying dry on the beach.

Schizothrix heufleri Grun. (Deg. & Deg. 24,580, Feb. 11, 1958), with Scytonema hofmannii, grew in a drying, rain-filled depression one mile east of the north Landing Strip. It formed a thin mat over the sandy, cocoa-colored loam. Regarding another collection (Deg. & Deg. 24,600a, Feb. 10, 1958), see Nostoc calcicola.

Schizothrix lamyi Gom. (Deg. & Deg. 24,598, Feb. 11, 1958) grew one mile off the north Landing Strip with Porphyrosiphon fuscus and Entophysalis deusta in a drying depression once filled with rain water.

The tough, 1-2 mm. thick, greenish film was exfoliating due to shrinkage induced by drying, and curling upward and inward to expose the cocoa-colored underside and the now bare, similarly colored, exposed ground.

Schizothrix longiarticulata Gardn. (Deg. & Deg. 24,567, Jan. 31, 1958), with some Scytonema hofmannii, grew inland, namely near the ancient guano railroad wharf. It formed a firm covering over the brownish sun-baked loamy sand, but was beginning to crack here and there, and exfoliate. The same species (Deg. & Deg. 24,585a, Feb. 11, 1958), found with Calothrix crustacea, was about three miles east of the Landing Strip. Additional collections are Deg. & Deg. 24,596a, Feb. 11, 1958, with S. taylorii; and Deg. & Deg. 24,579a, Feb. 14, 1958, with Microcoleus acutissima.

Schizothrix taylorii Dr. (Deg. & Deg. 24,596, Feb. 11, 1958), along with S. longiarticulata and Scytonema hofmannii, was collected one mile east of the north Landing Strip. These plants covered the loamy bottom of a drying depression of rain water with a thin film. This acted as a dustbinder only until thorough drying caused the film to crack, curl and exfoliate. Another collection (Deg. & Deg. 24,582, Feb. 10, 1958), formed a greenish film over the cocoa-colored mud of a shallow arm of the lagoon, on the south side of the atoll.

Spirulina subsalsa Cerst. (Deg. & Deg. 24,753, Feb. 12, 1958) was brought from a depth of ten to fifteen feet for us in the lagoon by Mr. Albert Lincoln by skin diving.

Spirulina tenerrima Kütz. (Deg. & Deg. 24,785, Feb. 6, 1958) grew in association with Hydrocoleum lyngbyaceum Kütz., on a smooth, limestone, ocean reef along the north shore.

Sumploca hydnoides Kütz. (Deg. & Deg. 24,750) was collected under similar circumstances as Spirulina subsalsa.

NOSTOCACEAE

Nodularia sphaerocarpa Born. & Flah. (Deg. & Deg. 24,599a, Feb. 11, 1958), see discussion of Phormidium papyraceum.

Nostoc calcicola Breb. (Deg. & Deg. 24,600, Feb. 10, 1958), in association with Schizothrix heufleri, grew near the ruins of the PAA hotel, south of Musick Light. Here we found a concrete platform, exposed to full sunlight. A few of the cement squares had tipped in settling, enabling a rain puddle to form. Here grew the above plants.

SCYTONEMATACEAE

Plectonema nostocorum Born. (Deg. & Deg. 24,599b, Feb. 11, 1958), see discussion of Phormidium papyraceum.

Plectonema terebrans Born. & Flah. (Deg. & Deg. 24,573c, Feb. 8, 1958), see discussion of Johannesbaptistia pellucida; for Deg. & Deg. 24,595a, Feb. 1, 1958, see treatment of Microcoleus tenerrimus.

Scytonema hofmannii Ag. (Deg. & Deg. 24,572, Feb. 2, 1958) is probably the most persistent sand-binder on Canton, and fortunately common. It is to be seen about the CAA residential area along and even on the white roads, where pincushion-like tufts of Fimbristylis pycnocephala and the more open F. dichotoma grow. Omitting the larger projecting pebbles, gleaming white in contrast, it covers the surface of the ground with an almost black matrix. When we drew the attention of several residents to these Scytonema areas over which they had been walking day after day, they were astounded to learn that what they had always considered a tar-rich asphalt was actually a colony of "seaweed or limu." With the Scytonema grew some Microcoleus chthonoplastes. These areas in February were alternately sun-scorched and rain-drenched. Additional collections of this species are Deg. & Deg. 24,567a, Jan. 31, 1958, with Schizothrix longiarticulata; Deg. & Deg. 24,580a, Feb. 11, 1958, with Schizothrix heufleri; and Deg. & Deg. 24,596b, Feb. 11, 1958, with Schizothrix taylorii.

RIVULARIACEAE

Calothrix crustaceae Thur. (Deg. & Deg. 24,585, Feb. 11, 1958), with Schizothrix longiarticulata and the almost ubiquitous Entophysalis deusta, was loosely holding the white, muddy sand in a drying depression three miles east of the north Landing Strip. It (Deg. & Deg. 24,581a, Feb. 15, 1958) grew with the same E. deusta in a drying fresh water puddle one mile west of Shark Pool, southeast tip of Canton. For specimen Deg. & Deg. 24,595c, Feb. 1, 1958, see discussion of Microcoleus tenerrimus.

- - - - - -

Lichens, mosses and ferns have not been found on Canton.

REFERENCES CITED

Dawson, E. Y. Some marine algae from Canton Atoll. Atoll Res. Bull. 65: 1-6 , 1959.

Degener, E. and Degener, I. The Hawaiian beach Scaevola (Goodeniaceae). Phytologia 6(6): 321, 1958.

Degener, O. and Fosberg, F. R. A Central Pacific Sesuvium. Occ. Pap. Bishop Mus. 21: 45-47, 1952.

Degener, O. & Gillaspy, E. Canton Island, South Pacific. Atoll Res. Bull. 41: 1-50, 1955.

Fosberg, F. R. Pacific forms of Lepturus R. Br. (Gramineae). Occ. Pap. Bishop Mus. 21: 285-294, 1955.

Fosberg, F. R. and Sachet, M.-H. The Indo-Pacific strand Scaevola. Taxon 5: 7-10, 1956.

Hansen, I. and Potzal, E. Beitrëge zur Anatomie und Systematik der Lepturae. Bot. Jahrb. 76: 250-270, 1954.

Hatheway, W. H. The natural vegetation of Canton Island, an equatorial Pacific atoll. Atoll Res. Bull. 43: 1-9, 1955.

Van Zwaluwenburg, R. H. The insects and certain other arthropods of Canton Island. Atoll Res. Bull. 42: 1-11, 1955.

Webster, G. L. Studies of the Euphorbiaceae. Phyllanthoideae II. The American species of Phyllanthus described by Linnaeus. Jour. Arnold Arb. 37: 1-14, 1956.

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

P.O.Box 456
Kahului, Maui
May 18, 1959

Dear Dr. Degener:

Just to recap the info of your phone call to Jimmy Lindsay, we have reserved cabins for your expedition as follows: Holua - May 27,28 ; Kapalaoa - May 29,30 ; Holua - May 31 thru June 5. The reason for the break is that a group of 15 hikers had already reserved Holua on the 29th and a group of 12 on horseback will be there on the 30th. There is a possibility that the horse group will cancel their stay at Holua. Since you are not going to use Waikau cabin, you will not need to bring your handy-dandy Folding (portable) toilet.

Regarding the drier, do you think sections of masonite would be satisfactory? We have some old boards and masonite which could be used. We are trying to figure how many pack animals will be needed to take your supplies into the crater. Do you think 15 gallons of kerosene would be enough ? Or maybe 20? Actually, the air is much drier at Holua than at Hailaau, so it won't be quite such a problem to dry plants. Talking with Ward on the phone, he suggested the possibility of using charcoal for drying heat. He's going to contact you about this. It would certainly help to reduce the weight for the pack animals.

There is a good supply of wood at the cabins for the cook stoves. There are also plenty of blankets and mattresses for the bunks in the cabins, so you don't need to worry about bedding unless you want to bring sheets along.

If we can get Ward to bring the supplies up the day before you arrive, it will allow us time to get packed and ready to go by the time you get here. I think I wrote earlier that we might have horses for you to ride in, but, this may not be so. However, it is an easy hike of four miles from the road- Halemauu Trail junction down to Holua cabin.

Re Joe Dowson and his pistol, the use of firearms is not permitted in the park.

As if stands now, I will probably be able to join you in the crater on my days off only. That would be June 2 and 3. I would hike in after work on Monday and out Wednesday afternoon.

If Mrs. Degener and her mother come sightseeing up the mountain before you arrive, I will be glad to show them around the park area if they will stop at the headquarters building or let me know when they will be here.

We appreciate your offer of the use of drawings of plants you collect here. Doc Ruhle is now in the process of completing a booklet for the Haleakala Section. It may be that we will have need for illustrations in some future publication.

We will try to arrange to have good weather during your stay here. Please let us know if there is anything else we can do in perparation for your visit.

Sincerely,
Bob Carpenter

During your side trip to Kapalaoa you can leave your equipment at Holua, and take just food over; enclosed is a map for you to study.

May 19, 1959.

Dear Mr. Carpenter:

I was glad to get your May 18 letter with the information. I am surprised the letter reached here so promptly.

It is nice we can have Holua May 27 & 28. That will give us one excellent botanizing day. Perhaps later during our Haleakala stay, Mr. Tom McGuire and Mrs. McGuire will join us. He is forester with Bd. Agri. & Forestry in Honolulu. They are awfully nice people; never been in Haleakala before. They must know Mr. Korte.

Did I write you that years ago I collected a kokoolau or Bidens southeast of Kapalaoa cabin growing on the cliffs? I threw rocks at the plants until one knocked down to me, and I had a good drawing made of it. But I never got seeds so the drawing can't be printed and the plant not properly identified. The drawing thus is simply wasted. I want to see if my luck won't improve this time. So Kapalaoa May 29-30 should decide whether we get this plant for inclusion in the Flora Haw., or not.

Then about Paliku I got a new species of Silene with almost hair-like leaves. By the time I got around to think of drawing it, the fls were hopelessly injured - bugs or something. I want to get good material pickled so it can be drawn back home properly. I have had the habit sketch waiting for the fl. drawing for 20 or so years.

Did you know that a generation or so ago I studied the silversword for the Service and Otto Swezey, father of Joe S. of Lahaina, published a paper on the injurious insects on it. Flies were chewing up the young seeds & preventing further spread of the plants. The flies were doing this injury while maggots. I recommended letting the "swords" grow under chees cloth to keep the flies away.

Masonite would be fine for a drier.

The dryness of the air, I fear, won't make much difference in the drying of the plants. Charcoal would not work - might even be a fire hazzard - as it would more likely heat and rot the plants rather than dry them with a blast of hot dry air. 20 gals., would be safer than 15.

We plan bringing our sleeping bags. They are light. Who knows, they might be handy should we want to stay over night at the Kolau Gap Forestry cabin without the handydandy portable watchyoumacallit.

We need no horses to ride in. It is a kind thought and we appreciate it. We are not horse-men & -women. Anyway, it is easy enough to walk down hill. Then by the time we must go out of the crater, we will be in pretty good hiking shape to walk uphill provided we need not carry too much.

Mrs. D. arrives Saturday A.M., and I guess our air freight will be at the airport a couple of days before that. So, Ward Fleming willing

We will be looking for you June 2 - 3.
We plan to leave June 5 UNLESS it is convenient for the Service to have us longer somewhere AND we have not gotten a representative collection by that time. I fear we can botanize only every second day, pickling and drying the material in between. Because of the cost to NSF for transportation to & from the two Islands, we just MUST bring home a successful catch which, of course eventually, gets to the Smithsonian. And yet, because we are going to Montreal to the International Congress (Botanical) this summer, we can't stay on Maui long. Thus we are squeezed uncomfortably. Mrs. D. & I must label our catch at least provisionally before we leave the Islands. Do you know it took us three entire weeks to label the last Maui catch of plants? It is some drudgery.

We are looking forward to seeing you and Jim Lindsay of the Service.

Aloha,

DIOSPYROS HILLEBRANDII (Seem.) Fosb.

Mabe Hillebrandii Seem. Fl. Vit. 151. 1866.
Diospyros Hillebrandii Fosb. in Occas. Pap. B.P. Bishop Mus. 12 (15): 9. 1936.

Small tree with dark horizontal branches. Leaves oblong, 7 - 16 cm. long, 3 - 6.5 cm. wide, with petiole about 4 mm. long, obtuse to rarely somewhat acute at apex, moderately contracted or rounded or sometimes even emarginate at base, coriaceous, entire, glabrous, above dark-green shiny conspicuously rugose with fine network of veins, paler and smooth beneath, often red when young. Floral bracts glabrate. Calyx ~~[illegible]~~ green, coriaceous, glabrous except for strigose-silky apex, with 2 mm. long tube and with broad triangular acute lobes 3 - 4 mm. long. Corolla glabrous within, on outer surface glabrous where sepals overlap but otherwise strigose-silky with stramineous hair except on margin., with tube 4 mm. long and with ovate 3 mm. long acute recurved pink lobes. Stamens 9, short, glabrous, with pointed anthers. Ovary ovate-conical, strigose-silky from glabrous base

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

May 19, 1959

Dr. Otto Degener
68617 Crozier Drive, Waialua
Oahu, Hawaii

Dear Otto:

I am delighted to learn from your letter of April 22 that you were able to get in some fine field work on Maui and Molokai. It sounds as though you made good use of your time. I think field work of this sort is just as important as the continued publication when the matter of a further renewal of your grant comes up.

I am very pleased to have the Argyroxiphium from Puu Kukui. I believe I shall turn these sheets over to the National Herbarium, but it has been fun to have them on my desk these several days for purposes of reminiscence.

With best regards,

Cordially yours,

David D. Keck
Program Director for
Systematic Biology

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

May 22, 1959

Dr. Otto Degener
68617 Crozier Drive,
Waialua, Oahu, Hawaii

Dear Otto:

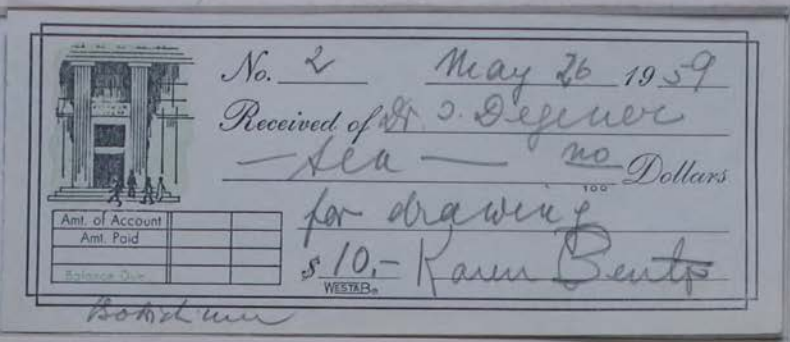
I am really very glad to have the careful explanation in your letter of May 9 as to the many exotics illustrated in your Flora. This all makes sense now and I appreciate hearing about your problems. You are to be commended for having accomplished so much in the art line with modest funds.

Best wishes for the forthcoming trip to East Maui, and I look forward to seeing you later in Montreal.

Very truly yours,

Dave

David D. Keck
Program Director for
Systematic Biology



No. 2 May 26 1959

Received of Dr. Degener

— Ten — no/100 Dollars

for drawing

$ 10.- Karen Bento

WESTAB.

Amt. of Account
Amt. Paid
Balance Due

Bookkeeper

WAIALUA BRANCH

WAIALUA, HAWAII

59-117
1213

BANK OF HAWAII

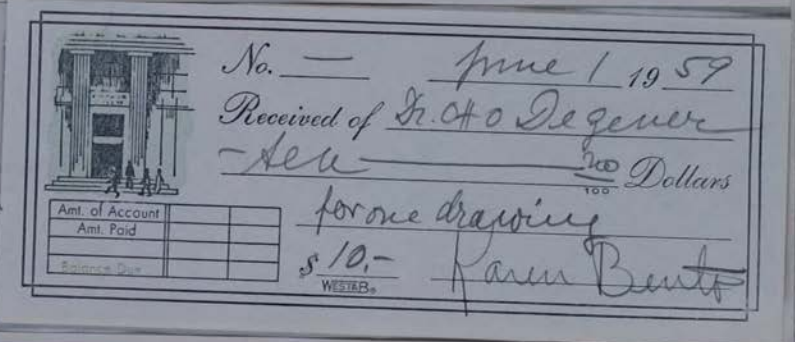
May 26 1959 NO. —

PAY TO THE ORDER OF Karen Bento $ 10 no/100

— Ten no/100 — DOLLARS

DR. OTTO DEGENER or
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

Drawing Dr. Degener



No. — June 1 1959

Received of Dr. Otto Degener

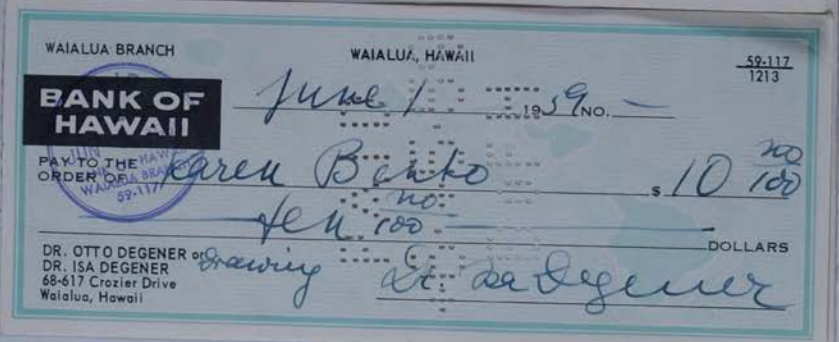
— Ten — no/100 Dollars

for one drawing

$ 10.- Karen Bento

WESTAB.

Amt. of Account
Amt. Paid
Balance Due



WAIALUA BRANCH

WAIALUA, HAWAII

59-117
1213

BANK OF HAWAII

June 1 1959 NO. —

PAY TO THE ORDER OF Karen Bento $ 10 no/100

— Ten no/100 — DOLLARS

DR. OTTO DEGENER or
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

Drawing Dr. Degener

Res. Phone 33-3355

JOEL K. HOLAU

U-DRIVE & TAXI

P. O. Box 331
Wailuku, Maui, T. H.

Car Rented To ..... Operator's License No. 17985-

OUT (Time & Date) 8 AM 6/9/59 Car License No. 4819

RETURNED (Time & Date) ..... Car Make & Model .....

RATE SCHEDULE

$ 8.00 per day for 50 miles 10¢ thereafter.

In consideration of the rental of the above car to me, I do undertake and agree to hold the rentor safe and harmless from any loss, damage and injury either to persons or property that may arise or occur in or in connection with the use of said car occasioned by any carelessness or negligence or illegal operation thereof on my part or on the part of any person employed by me orunder my direction and control.

(Be sure and keep car locked when it is unoccupied. Speedometers are sealed; if found broken, renter will be responsible and subject to fine.)

Renter's Signature Raul Hamano

Address Kahului Maui

DEPOSIT: $

Mileage In	21331	6.20
Mileage Out	21309	6.20
Total Mileage	= 22	8.00
Miles Allowed	50	14.20
Over Mileage	= 0	3.00

..... Over Mileage ..... Per Mile - $ .....

..... Days $ ..... Per Day - - .....

3½% T. H. Tax ..... - - .....

Grand Total - - - - - - $

By 6/9/59

Res. Phone 72-327

MAUI U-DRIVE & TOUR SERVICE

JOE "Red" VIELA, JR., Manager

Airport Phone 72-9355

P. O Box 765 • Wailuku, Maui, Hawaii

Car Rented To Mr Joseph Bowen Date June 6, 1959

OUT (Time & Date) June 6, 1959 9:30 AM Car License No. 21 600 12 801

RETURNED (Time & Date) June 7 1959 7 AM Car Make & Model 1957 Ford Ranch Wagon

RATE SCHEDULE

$ 8.00 per day for 50 miles 10¢ thereafter.

In consideration of the rental of the above car to me, I do undertake and agree to hold the rentor safe and harmless from any loss, damage and injury either to persons or property that may arise or occur in or in connection with the use of said car occasioned by any carelessness or negligence or illegal operation thereof on my part, or on the part of any person employed by me or under my direction and control.

(Be sure and keep car locked when it is unoccupied. Speedometers are sealed; if found broken, renter will be responsible and subject to fine.)

Renter's Signature

Operator's License No. 0-99 [illegible]

Address

DEPOSIT: $ Ramage 7.00

Mileage In	67623	67623
Mileage Out	67820	67482
Total Mileage	197	141
Miles Allowed		50
Over Mileage		91
	147	100
		47

147 ..... Over Mileage ..... 10¢ Per Mile - $ 14.70

2 ..... Days $ 8.00 ..... Per Day - - 16.00

3½% T. H. Tax ..... - - 1.90

Grand Total - - - - - - $ 32.60

Maui U-Drive & Tour Service By

June 11, 1959.

Dear Dave:

We're back with plants AND the flu, but only a mild case between us. The cost to NSF comes to just under $500, and to us due to personal expenses to another $100 or 200. We know one thing still more definitely than before: to really do Koolau Gap thoroughly and no other area whatsoever, we would need many thousands of dollars to hire men to cut trail and be bearers, and to build base camps with perhaps material thrown down to us from an airplane. It really should be an NSF project all its own.

Due to us dwelling at sea level, working at 7000 - 10,000 ft., for any great length of time is impossible. We simply get out of breath and the heart action is quick even after we have retired to our bunks. The rain gauge youngster, physically the best of us all, got so ill from overexertion that he had vomiting spells, fever and was dopey. Some thought it ut. sickness. We were so worried we had the rangers telephone his father for advice. Luckily, his illness cleared, an illness not covered by the insurance I had taken out for him.

We got good material, herb. & pickle, for study and drawing, and the horrible shock that so many endemics studied with ease in 1927 are either extinct or on the verge of extinction. To make matters worse, Governor Quinn signed a bill that axis deer are to be liberated on the slopes of Haleakala. This is all a very sad situation, just plain silly! Our Haw. Bot. Society is trying to have the Law repealed by the next Legislature/

To offset some personal expenses, like attending the Congress in Montreal, Isa and I have accepted two writing jobs with Haw. Nat. Park, with deadline Jan. 1, paying a total of $700. It is like the CAA project we took last year, of which I enclose a reprint.

Aloha,

GDA

THE NEW YORK BOTANICAL GARDEN

BRONX PARK NEW YORK 58, NEW YORK LUDLOW 4-8500

President
CHARLES B. HARDING

Treasurer
BERKELEY GAYNOR

Vice President
FREDERICK S. MOSELEY, Jr.

Director
WILLIAM C. STEERE

June 11, 1959
Air Mail

Dr. Otto Degener
Waialua
Oahu
Hawaii

Dear Otto:

Thanks very much for your letters of May 6 and 15 which have been noted with interest. I trust your forthcoming field trip meets all your expectations.

In administering grants at the Garden we have adopted a new procedure. In effect this involves the setting up of any remittances as advances to be accounted for. In other words this is sort of carried on our books as a loan until we receive a full accounting for the money. This pretty much in effect is what we have been doing with you anyway but maybe the above will clarify the picture a bit. Is it possible for you therefore to account for each payment made to you in this manner? This is done of course to facilitate our accounting to the grantor.

With best regards and good luck,

Sincerely yours,

H. de la Montagne
Secretary

HM:md

June 16, 1959.

Dear Mr. Montagne:

I have your letter of June 11. I guess your change in accounting does not affect the book keeping here in the Islands.

Our Maui expenses, for which we still lack some cancelled cheques until they come from the bank about July 1, adds up as follows for the four of us:

Food (from various stores) This includes feeding "guests" such as Park Ranger & Park Naturalist who helped us with pack animals etc.	$ 111.34
Air cargo	13.08
Insurance for Dowson & Fleming	21.48
Tickets ($73.92 minus refund of about $6 because of later change in flight time)	67.92
Ward Fleming (cheque still at bank)	50.00
Car rentals ($57.80 minus $2 adjustment, and $22.50)	78.30
Hotel	64.76
Mary, the mule (cheque still at bank)	41.40
Red Purse (kerosene $4.50, phones $4.90	9.46
Total	$ 457.74

We collected some nice material, including formalin samples for Flra Haw., drawings. But the trip to me was disturbing. Koolau Gap, where I had collected and studied such a wealth of endemic plants in 1927, can hardly be recognized. The greensword (Argyroxiphium virescens) is gone as well as the many kinds of Dubautias and Railliardias. Only a few Neurophyllodes bushes remain where the area was silvery with them. The great swarms of Plantago hybrids, described in error by Pilger and by Rock as so many good species, I saw represented by half a dozen specimens in a few sickly tussocks of Oreobolus where this freak plant once covered the ground with a prickly carpet. The plant that wrecked this magnificent area that I had once recommended to be included in the National Park is plain ordinary orchard grass (Dactylon glomerata)! It grows in such thick masses that no seed can germinate and survive in it. There is thus no replacement of the endemics as the old specimens gradually die.

6/16/59

Coming from sea level we were a bit overcome by the 7,000 - 10,000 ft., elevation of Koolau Gap and Haleakala. The strongest and most active, the 25 year old rain gauge reader, Ward Fleming, who slung packs off & on the animals, finally became so ill (vomiting, splitting headache & "grogginess") that we had a ranger contact his physician father for advice. Luckily all went well after all.

As expected, a budget of $500 that I considered expendible for further collecting this year, is too little for Koolau Gap and neighborhood. Ideally, I should spend ten times that amount with Ward Fleming's aviator brother dropping equipment to us from his plane.

Isa & I shall attend the Botanical Congress in Montreal this Fall, and to help make ends meet will work on two floristic problems at the Kilauea Section of Hawaii National Park. This will be between Sept. and Jan. 1, netting us $700. The project will help us at the same time get plants from the Island of Hawaii for our Flora.

Aloha,

July 6, 1959.

Dear Mr. Montague:

To supplement my letter of June 16, I here enclose three cheques: namely for a $40.50 car rental charge (we likewise had a few smaller bills for cars); $25.00 for Ward Fleming; and $41.43 for Mary, the pack mule. The $~~XXXX~~ $1.43 of this last cheque is actually the Territorial tax. I had figured it at $1.40 in the June 16 letter, which sum, to simplify matters, we should let stand as the official figure if you don't mind. There is still one outstanding cheque of $25.00 for Ward Fleming services on Maui. That will eventually follow in some later letter. The total figure for the Maui trip, then, comes to $457.74.

Now I should like to complete our semiannual report as of July 1, 1959:

NSF. Jan. 30, 1959 - - - - - - - -	$ 1,200.00
NSF. Apr. 27, 1959 - - - - - - - -	1,600.00
TOTAL	$ 2,800.00

EXPENSES to July 1, 1959

Car (Maintenance, parts, repair - this is through July 6) -	$ 148.12
Drawings -	136.00
Printing -	936.88
Major collecting trips - - - - - - - - - - - - - - - - - - -	753.50
Coleman lanterns -	84.57
Red Purse (Hon. Paper Co., Bishop Museum photostats, supplies, etc.) -	119.99
Postage (estimate) -	114.41
TOTAL	$2293.47

The postage bill for the six months according to our receipts was $228.83. This includes packages of herbarium specimens & pickled plants, Proofs & drawings to printer, gifts of Book 5, AND postage of private and nonbotanical character. I am charging NSF only half though its postage certainly exceeds the estimated $114.41.

Thus of the $2,800,00 cash, after our expenses of $ 2293.47, we have a balance of $506.53 remaining to NSF credit. As we are leaving here July 16 for the Congress in Montreal and won't be back until about the middle of September, this sum will remain pretty static in the local bank until our return. We wanted to print a fascicle for Flora Haw., before our leaving, but in correcting proof the printer made so many NEW mistakes that I fear it is impossible to get the work finished in time.

Aloha,

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

July 8, 1959

Dr. Otto Degener
68617 Crozier Drive
Waialua, Oahu, Hawaii

Dear Otto:

I wish to acknowledge receipt of two postal cards, including the lovely one in color of the Silversword, and your letter of June 11 enclosing a copy of your Canton Island survey. I much appreciate getting these interim reports on your activities.

You asked me to write an official note of thanks to Assistant Superintendent Thomas Whitcroft of the Hawaii National Park. I am sorry, but I do not feel free to write a letter of this sort as Mr. Whitcroft was doing you a very big favor, but actually this was no affair of the NSF. Your research is not done for us, but we are in a similar position to Mr. Whitcroft in that both of us are trying to help you. This may seem like a tenuous distinction to you, but there is actually no more reason for me to write Mr. Whitcroft in this connection than for him to write the Foundation.

I look forward to seeing you in Montreal.

Sincerely,

David D. Keck
Program Director for
Systematic Biology

July 14, 1959.

Dear Dave:

Here are six samples of the fascicle of Flora Hawaiiensis Book 6 published today. I have more material in page proof but cannot get it into press before our dash to the Mainland. The two cuts are based on drawings made a score of years ago - hence no cost except printing cost.

Today, date of publication, 100 or so sets are going into the mails to interested individuals and institutions.

As you know, I have had only 100 sets punched and trimmed, the remaining 2,900 at the printers to be punched and trimmed when printing of Book 6 has been completed. The binding job is then more precise and first class looking.

When a former fascicle was completed I mailed the no-longer-wanted Argemone zinco to the local newspaper with ~~the~~ proper sheet. They printed it.

I thought a letter of thanks from you to the Superintendent of Haw. Nat. Park at Haleakala would have been appropriate, as a similar letter from me would not mean so much. But I can see your point that both NSF and the National Park Service are helping me.

Isa and I will see you in Montreal. We are eager to hear New York and Washington news. We were sorry to learn of thepassing of Isa's former chief Dr. Werdermann. On returning home from his Africa trip, his dog greeted him and Mrs. Werdermann. Twenty minutes later he suffered a fatal heart attack. His ashes have been placed in the Garden in Dahlem with those of Diels & Pilger.

Aloha,

Paradise OF THE Pacific, LIMITED

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Dr. Otto Degener
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Montreal, Canada

DATE 7/20/59

CUSTOMER'S ORDER No.

OUR ORDER NO. 64321

SHIPPED VIA

TERMS: 30 DAYS NET

SOLD BY ES

QUANTITY	DESCRIPTION			UNIT PRICE	AMOUNT	TOTAL
8	Lots Flora Hawaiiensis					
	Family 17d	Aspleniaceae	47.62			
	Family 19	Lycopodiaceae	33.12			
	Family 98	Proteaceae	20.70			
	Family 119	Caryophyllaceae	33.12			
	Family 124	Ranunculaceae	33.12			
	Family 190	Euphorbiaceae	44.50			
	Family 190	Euphorbiaceae	44.92			
	Family 235	Guttiferaceae	33.12			290.22

PAID

JUL 20 1959

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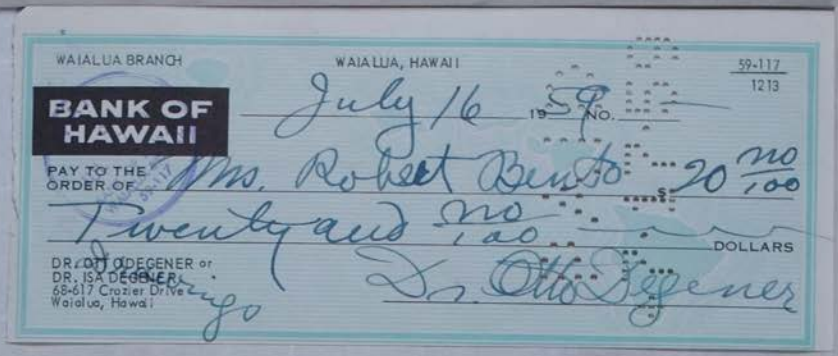
By Mary Kahanamoku


WAIALUA BRANCH

WAIALUA, HAWAII

59-117
1213

BANK OF HAWAII

July 16 19 59 No.

PAY TO THE ORDER OF Mrs. Robert Benson $ 20 00/100

Twenty and 00/100 DOLLARS

DR. OTTO DEGENER or
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

Dr. Otto Degener

Xmas

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

July 23, 1959

FOR YOUR INFORMATION

DAVID D. KECK APPOINTED PERMANENT PROGRAM DIRECTOR FOR SYSTEMATIC BIOLOGY

The National Science Foundation announced today that David. D. Keck has resigned his position at the New York Botanical Garden in order to remain permanently as Program Director for Systematic Biology of the Foundation's Division of Biological and Medical Sciences. He came to this position in October 1958 on leave of absence from the Garden.

The Systematic Biology Program receives and processes research proposals and currently administers over 300 active grants.

In 1950, Dr. Keck joined the staff of the New York Botanical Garden as Head Curator; he became Assistant Director in 1955 and served as Acting Director in 1958. From 1926 to 1950, he was on the staff of the Division of Plant Biology of the Carnegie Institution of Washington, at Stanford, California. There he was a member of a research team that did pioneer work on the nature of plant species. He is the author of many technical papers and has collaborated with Philip A. Munz in writing "A California Flora" that has just come from the University of California Press.

NATIONAL SCIENCE FOUNDATION
WASHINGTON 25, D. C.

July 28, 1959

Dr. Otto Degener
P.O. Box 187
Waialua, Oahu, Hawaii

Dear Otto:

This is a brief acknowledgment of your interesting letter of July 14 and the six samples of the fascicle of Flora Hawaiiensis Book 6 published July 14. Thank you also for the newspaper clippings and the alluring travel brochure on Maui. All of these sendings contribute toward making your research the most fully documented of any project in our files.

I was sorry to learn from your letter of Dr. Werdermann's passing. I had had correspondence with him when I was in New York.

I enclose a news item of my own for a change. A CALIFORNIA FLORA is 1681 pages in length and one is always glad to see a job of that size completed.

I look forward to a visit with you in Montreal.

Very truly yours,

David D. Keck
Program Director for
Systematic Biology

7/23/59

BUDGET FORM
(Stock No. 002)

For Department or Project NSF Grant #G6377 (Name) (Degener) 326 (No.)

Expense Account	July 1 - December 31	July 1 - June 30, 1960
01 Salaries - City		
02 Salaries - Garden		
04 Extra Time - Garden		
05 Wages - City		
06 Wages - Garden		
07 Outside Services		
08 Equipment		$ 200
09 Supplies and Materials		200
11 Postage and Express		200
12 Travel		900
14 Printing		3,370
Sub-Total		
Charges from Other Departments		
Total Charges		$ 4,870

Submitted by _____ (Person in Charge) (Date)

Approved by Robert Holbrook 8/14/59

Approved by _____

14.5.59.

10.– Dollar

for 1 Drawing

Paint

Karen Beutz

NSF Form 6-1
AUG 1957

Form Approved
Budget Bureau No. 99-R013.1

NATIONAL SCIENCE FOUNDATION

GRANT FISCAL REPORT

From: The New York Botanical Garden
(Grantee)

Bronx Park, New York 58, N. Y.
(Address)

To: Grants Administrator
NATIONAL SCIENCE FOUNDATION
Washington 25, D. C.

Date: Sept. 8, 1959

Report of obligations from NSF funds for grant number: G 6377
(NSF No.)

Reporting period: Jan. 1, 1959 (Date) to June 30, 1959 (Date) (inclusive)

Type report: Interim [X], Number 1; final [ ] (check one)

	Item	Amount Expended
1.	Salaries and wages	$
2.	Equipment (permanent)	
3.	Supplies, materials, and expendable equipment	204.56
4.	Travel	301.84
5.	Publication costs (Total - page costs, reprints, direct labor, etc.)	1072.88
	(a) Page costs only, if available	
	(b) Reprints, direct labor, and any other publication costs	
6.	Other (Specify): Postage	114.41
7.	Total direct costs - Add lines 1 through 6	1693.47
8.	Allowance for indirect costs - 15 % of line 7	144.00
9.	Total obligations for above period - Add lines 7 & 8	2837.47
10.	Total obligations for prior periods	
11.	Total obligations to date - Add lines 9 & 10	

COMMENTS: (Continue on reverse side if necessary)

SIGNED: _____ TITLE: Assistant Director

TYPE NAME: Robert F. Kolreback

Two copies of an interim fiscal report are due approximately six months from award date of a grant and at six month intervals thereafter. Five outstanding commitments should be considered as obligations for the purposes of interim reports. Two copies of a final fiscal report are due as soon as possible after all costs chargeable to the grant are known. The following certification, in the case of final reports, should be inserted above, immediately preceding the signature of the official authorized to sign for the grantee institution: "I certify that this final fiscal report is correct and that the expenditures included herein are deemed properly chargeable to the grant." Unused funds are to be returned by check payable to the National Science Foundation.

THE NEW YORK BOTANICAL GARDEN
BRONX PARK NEW YORK 58 NEW YORK LUDLOW 4-2500

President
CHARLES B. HARDING

Director
WILLIAM C. STEERE

Vice Presidents
FREDERICK S. MOSELEY, Jr.
Mrs. HERMANN G. PLACE

Treasurer
R. GORDON WASSON

September 9, 1959
Air Mail

Dr. Otto Degener
Waialua
Oahu
Hawaii

Dear Dr. Degener:

As usual I must apologize for my seeming neglect in not acknowledging your letter of July 6, 1959 with semi-annual report to July 1, 1959. These figures were just what we wanted. In this regard I enclose for your information report for the 6 months period ending June 30, 1959 which we have just rendered to the N.S.F. You will be interested also in a budget enclosed herewith which we have tentatively set up for the fiscal period ending June 30, 1960. We are extensively revising our accounts as of July 1, 1959. We simply made some guesses about the monies you might have available for use during that period. We realize that your grant covers an extended period of time and comes in at odd times and in uneven amounts and can be used pretty much at your own discretion within the broad outlines of your application.

I also have your letter of August 26 from Montreal and had hoped that you would be stopping in here at the Garden. I hope you had a good trip to Mexico.

With best regards,

Sincerely,

H. de la Montagne
Secretary

HM:md

DELIVERY MEMO
(Customer's Copy)

DATE 11, 9, 59

FOR Dr. Otto Degner

YOUR ORDER NO.

OUR JOB NO.

NUMBER OF PACKAGES 68

RECEIVED THE FOLLOWING IN GOOD ORDER:

68 packages printed pages
punching and trimming
paid for last mat done.
Plus aplatitiand Pages Previously
delivered.

Name of Firm | *Name of Person Receiving Merchandise*

P 13258

FROM

PARADISE OF THE PACIFIC, LTD.

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WAIALUA, HAWAII

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BANK OF HAWAII

Oct. 7 1959 NO.

PAY TO THE ORDER OF Carol Woodward $20 86/100

twenty 86/100 DOLLARS

DR. OTTO DEGENER or
DR. ISA DEGENER
68-617 Crozier Drive
Waialua, Hawaii

Hutchinson

Dr. Isa Degener

Dr Degener

FOR: Department Heads and Project Directors

FROM: R. F. Kolkebeck

DATE: November 9, 1959

SUBJECT: Expense Reports

REFERENCE: My memo 6/9/59: Accounting and Budgeting System Effective 7/1/59

The accounting department has been delayed in preparing expense reports for the first quarter and instead will prepare expense reports for the four months ended October 31. You should receive these reports around November 15.

The report has a budget column in which you may wish to list the budget figures you have already received on budget form stock #002. Unfortunately, the accounting department is short-handed and will not be able to fill in the budget column.

Cents will be omitted from the report to save time.

If a budget has not been set for your department or project will you please see me at your convenience so that we can complete our budgets for the year.

If you have any questions about the figures in the reports please see Mr. Countey; if you have any questions about adjusting your budgets, please see me.

The reports will include all postage charges and cost distribution of extra time and wages through October 31. The reports will not include charges for the services of the Photographic Department since we have not yet established an hourly rate for these services.

Future expense reports will be issued quarterly as stated in my memorandum of June 9, 1959.

RFK:md

Nov. 12, 1959.

Dear Mr. Conniff:

I read in the Hon. Advertiser that you are taking over the "Paradise" mess.

I have been a customer of "Paradise of the Pacific" during its various ups & downs since about 1927. In fact, you people printed most of the five volumes of my "Flora Hawaiiensis" and are presently working on Book 6. You also printed (badly) a book about Fiji for me.

I wish to advise you that in your shop you have lots of LIVE copy, most of it ready to print in lots of 3,000. If you can have this finished for me to pick up, it will add a nice sum for the creditors. In other words, please don't throw out set up copy and the various zincos about Hawaiian plants.

The drawings, valued at about $25 each, in your hands are my own property and not of your concern. They were on loan for the making of further zincos.

If you will continue in business and maintain the same rate of prices, I am prepared to continue to mail you additional ms., so you can complete Book 6 and start on Book 7.

According to page proof here at home, you now should have set up in type in your shop the following pages, most of them ready to print af- only one or two lines of correction:

1:Botrychium:Subbifoliatum - 2 pages
48:Eleocharis - 2 pages
70:Crinum:Asiaticum - 1 page
100:Exocarpos:Menziesii - 2 pages
140:Argemone:Mexicana - 2pages
179:Fagara:Skottsbergii - 2 pages
190:[illegible] Chamaesyce - 2 pages
190:Chamaesyce:Arnottiana - 2 pages
190:Chamaesyce:Remyi - 2 pages
210:Dodonaea:sandw. 1 page
273:Psidium:Guava - 4 pages
282;Peucedanum - 4 pages
295:Diospyros:Hillebrandii 2 p.
332:Hedyotis:Axuminata 2 pages
339:Rollandia:Ang. 1 page
344:Bidens:Hillebr. 2 pages
344:Lipochaeta:Micrantha 2 p.

Aloha,

Dr. Otto Degener

Dec. 20, 1959.

Dear Mr. Montagne:

I think I wrote you that some convict squeezed himself as officer into the Paradise of the Pacific printing company until creditors threw him out and took over. Now the concern is getting on its feet again and working over my pages of ms. They will print a fascicle of Flora Haw., in a few days ready to be shipped to 100 interested individuals and institutions Dec. 28. Please, therefore, mail me an NSF cheque for $1,000.

I cannot say we are pleased with the suggested plan as to how to allocate the NSF grant funds. We believe the purpose of the grant is to furnish a useable Flora for the Islands and, to a lesser extent, for workers foreign to our islands. With this in mind, it was our aim to complete Book 6 with this grant. We feel that if cash remains available AFTER Book 6 is completed, then only should we spend it on extensive field work on outside islands. It would actually be a reward for having slaved away here at home and in the museum.

Our method is the most economical. The field trips presently are short dashes to particular areas on this island of Oahu for very particular plants. With our depleting supply of cash we can very easily end up with loose ends if we do not practice economy and care. Cost of transportation to other Islands is our bottle-neck.

Please don't forget that in order to get Book 6 in the hands of the reader we must conserve enough cash for the making of covers. Those for Book 5 came to about 72 cents each; with prices advancing, I cannot believe those for Book 6 will be any cheaper.

We are presently having a storm but it remains cool, not cold. The two highest mountains of Hawaii, however, are said to be snow-covered.

Aloha & wishes for a Happy New Yoear,

Dec. 28, 1959.

Dr David D. Keck,
National Science Foundation,
Washington 25, D.C.

Dear Dave:

We had a little excitement some time ago when we read that our printer, Paradise of the Pacific, might go bankrupt. Evidently a Mainlander, later discovered to have had a criminal record, elbowed his way as manager into the concern and almost wrecked it. We dashed to the place and hauled home 68 printed packages of Book 6 fascicles they were storing for us. As you know, when the book has been completed, only then will everything be trimmed and punched for greater accuracy. To punch a fascicle at a time produces a messy looking book.

Now that Paradise is on its legs again, we printed another fascicle, of which we here enclose the six copies desired. The selection was conditioned largely by the drawings. Those available for us the cheapest way were printed.

Isa and I have dropped a hint in writing to a part-Hawaiian family on the Island of Hawaii interested in plants that we might be ready for field work this February. If they offer us cash-saving advantages, off we shall go after having the NSF car overhauled. We do not know how easy it is to get spare parts for a Volkswagen on that island in case of a breakdown. By the way, our stretchers are alright for sleeping for a few hours at a time but certainly not for the entire night as one is just about immobile in them and cannot toss and turn in the normal way of sleep. We shall try mattresses. If the acquaintances can't offer us any cash-saving inducement we don't know what we shall do in February.

Book 6 will be more expensive than Book 5. We just cannot assemble the individual books ourselves but must leave that up to the printers who have a proper turntable for the job. We still have not assembled Book 5 here at the beach though pegging away at it much of the time. It were better to spend such time in the field and getting on faster with ms.

It was nice to see you and Mrs. Keck at Montreal last summer. How about coming out to Hawaii?

Greetings of the Season,

Aloha,

C. H. Lyon