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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY

File No. 9 12 17

DIVISION OF TERRITORIES AND ISLAND POSSESSIONS

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EQUAROTIRL ISLANDS

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REPORTS
FIELD REPRESENTATIVE
(18th Expedition)

IMPORTANT

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All files should be returned promptly to the File Room.

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Harold L. Ickes

Secretary.

Cruise from
Mar. 4, 1940
to
Mar. 23, 1940

U. S. GOVERNMENT PRINTING OFFICE 8—7886

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
DIVISION OF TERRITORIES AND ISLAND POSSESSIONS
WASHINGTON

April 23, 1940.

Lieut. Commander Frank T. Kenner, U.S.C.G.,
Acting Field Representative, Dept. of Interior,
Iolani Palace,
Honolulu, T. H.

My dear Commander Kenner:

This will acknowledge and thank you for your report of the 18th cruise to the American Equatorial Islands.

I was much interested in reading your report and am delighted to know that such remarkable progress is being made in the vegetation. Just the other day Captain Eaton of the Coast Guard asked how the coconut palms were getting on that had been planted some time ago. Your report had not been received and I fear I was not too enthusiastic over the possibilities of the growth of the plants.

Mr. Ashley Browne's report is extremely interesting but I agree with you that the construction of the cisterns might well be postponed until such time as the future status of the islands is definitely determined. We greatly appreciate the interest that Mr. Browne has taken in this matter.

As you already know, we have approved the removal of the camp on Canton Island to the new area designated by you and I trust that the Delco unit will no longer interfere with the radios at the Pan American and British camps. One of my pet peeves is to have radio interference so I can appreciate why these camps are anxious to get rid of the Delco units.

Your recommendation that the next cruise depart from Honolulu about the second week of July, 1940, is approved.

Sincerely yours,

(Sgd.) RUTH HAMPTON

Ruth Hampton,
Acting Director.

RH:pr

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
DIVISION OF TERRITORIES AND ISLAND POSSESSIONS
WASHINGTON

Iolani Palace
Honolulu, T. h.
April 12, 1940

Mrs. Ruth Hampton, Acting Director
Division of Territories and Island
Possessions
Department of the Interior
Washington, D. C.

My dear Mrs. Hampton:

Enclosed herewith narrative report of the Eighteenth Cruise to the American Equatorial Islands of Jarvis, Baker, Howland, Canton and Enderbury, which is being forwarded to Division office for information and file.

Very truly yours

Frank T. Kenner

FRANK T. KENNER
Acting Field Representative

FTK:kl
Encl.

C R U I S E R E P O R T

18TH CRUISE

to

AMERICAN EQUATORIAL ISLANDS

by

FRANK T. KENNER

Acting Field Representative
U. S. Dept. of the Interior
(Division of Territories
and Island Possessions)

Iolani Palace
Honolulu, T. H.
April 8, 1940

EIGHTEENTH CRUISE TO THE AMERICAN EQUATORIAL ISLANDS of JARVIS, BAKER AND HOWLAND CANTON AND ENDERBURY

By
FRANK T. KENNER
Acting Field Representative
U. S. Dept. of the Interior
(Division of Territories
and Island Possessions)

The TANEY departed Honolulu, T. H., after loading supplies, equipment and relief personnel for the American Equatorial Islands, at 5:00 p.m., March 4, 1940.

Department of the Interior personnel on board were:

1. Melvin Paoa
2. Woodrow Phillips
3. Oliver Roberts
4. Edward M. McCorriston
5. John K. Toomey
6. Henry M. Smith
7. David Hartwell
8. Waldron Henderson
9. Dominic P. Zagara, radio operator
10. Robert W. Lieson, radio operator
11. Joseph Keliihananui, extra man
12. Karl E. Jensen, extra man

Guests on board were:

1. Col. C. C. Stokely, USA
2. Lt. Col. G. E. Arneman, USA
3. Lt. Col. Isaac Spalding, USA
4. 1st Lt. Francis Hill, USA
5. Mr. Ashley Browne, Extension Horticulturist, University of Hawaii
6. Capt. G. E. Burritt, USA
7. Capt. J. P.Evans, USA
8. Mr. Philip Brooks
9. Mr. W. F. McBride
10. Mr. I. H. Polk

The TANEY arrived Howland Island 9:00 a.m., March 9, 1940. Landing conditions were excellent and all stores landed during the morning. An inspection of the colony was made and found to

be in excellent condition. All weather equipment and stores were inspected. There is a considerable quantity of material brought down on previous expeditions of no further use and of no value sufficient to warrant the return to Honolulu. This will be itemized by separate letter with a recommendation for its disposal. All radio equipment was found to be completely worn out and new receiver and new transmitter were installed, tested, and placed in satisfactory operating condition. The Government call assigned by the Federal Communications Commission KVZH, was assigned and is to be used only on Government business. A new wind charger unit was installed on this island. The following replacements in personnel were made:

Howland
Francis Stillman,
Thomas Bederman,
Alexander Robinson,

who were relieved by:

Edward M. McCorriston,
Robert W. Lieson,
Waldron Henderson.

Considerable rain has fallen on the island during the past three months. Vegetation was extensive and all plants, set out in October, 1939, showed remarkable growth. These were the first results under the project laid out by Mr. Ashley Browne, Extension Horticulturist of the University of Hawaii. From appearances a planned agricultural project is the solution to the problem of providing live wind breaks and shade trees around the colonies.

The TANEY departed Howland Island at 5:00 p.m. March 9, 1940.

The TANEY arrived Baker Island at 8:00 a.m., March 10, 1940. A survey of the shore line on the southwest side of Baker Island indicated poor landing conditions. Bad weather has removed most of the sandy beach line from the west side building it on the south side. A landing was finally effected on the west side of the island. Surf conditions were bad throughout the day. The landing of supplies and equipment was exceedingly difficult but finally effected by late evening. The radio on this island had been in-operative since early February. A new receiver had to be installed. The entire radio set-up was changed for phone operation only. No regular radio operator was left on this island. The leader established communication with Howland, only making one schedule a day. The Government call KVZB was assigned to this island. As there is no important traffic, the radio schedules were reduced to one schedule a day. The colony in general was excellent. Although water was plentiful some twenty drums were condemned as unfit for drinking and instructions were left that the water was to be used for washing and on plant life only. All food supplies that remained on hand were condemned and

destroyed. The old food supply had spoiled and it was not deemed advisable to chance further use of that food showing signs of spoiling. All weather equipment was checked. Considerable equipment brought down from previous expeditions was condemned as unfit for further service and of no value for return to Honolulu. This will be itemized under separate letter with suitable recommendation. The following replacements were made:

Baker Charles Stein,
Charles Au,
Louis Suares,

were relieved by:

Melvin Paoa,
John K. Toomey
Woodrow Phillips.

The gasoline generating unit was completely overhauled and placed in first-class operating condition. There is a considerable stock of old storage batteries worn out and no longer fit for service. Six new batteries were placed on the island. Old batteries will be returned on the next cruise to Honolulu with a view of re-building for future replacements. Plentiful rain in the last three months encouraged the growth of all vegetation. Practically all plants set out on the last cruise survived. A plan to a carefully tended project will produce satisfactory results for the future.

The TANEY departed Baker Island 7:00 p.m., March 10, 1940.

The TANEY arrived Canton Island March 12, 1940. All necessary stores and equipment were landed. The British Deputy Administrator, Mr. Fleming, was contacted and courtesies exchanged. Mrs. Fleming is now residing on Canton Island with her husband, having arrived several months ago via steamer from San Francisco. A series of conferences were held with Mr. William Mullahey, manager of the Pan American Airport at Canton Island. The Pan American Base is almost completed. The hotel is still under construction and landscaping the surrounding ground area has been started. The American colony was in very good condition. There being only two radio operators assigned in the last four months with the heavy weather and radio schedules prior, little could be done on the outside of the colony. It was decided for the next period to place three operators at Canton Island.

A general discussion indicated that much interference from the Delco unit in the American colony seriously interfered with the radios at Pan American and the British camp. A survey of the entire situation indicated that a move of the entire American colony to the westward about seventy-five yards with a new arrangement of the Delco plant and radio antennas would to a great extent

eliminate this interference and at the same time improve the conditions of the colony which is now too close to the edge of the lagoon. The subject of moving the colony will be taken up under a separate letter to Washington. Maurice Paquette who had been in charge of the American colony at Canton was released from employment by the Department of the Interior to assume a position with the Pan American Airways at Canton Island, effective March 12. Charles Stein and Dominic P. Zagara were assigned to Canton Island, Charles Stein being designated in charge. Henry Kong Lee remained at Canton. This now gives three operators which are deemed necessary in order to maintain the extensive weather and radio schedules now in effect with the American Equatorial Island Group. The TANEY remained over night at Canton Island during which time the census was taken and discussions continued for improvement of the American colony. Plans were drawn for the new site of the colony.

On March 13, the TANEY departed Canton arriving at Enderbury at noon. All stores and equipment were landed at Enderbury. The medical officer of the TANEY inspected the water supply, remaining food stores and inquired into the general health of the colony which was excellent. This colony was found to be in excellent shape. Bernard Rahe and Frederick Wilhelm were replaced by Oliver Roberts, William Smith and David Hartwell. Harold Kim remained in charge at Enderbury Island. It was decided to maintain four boys on this island for the next period. On the October cruise no radio operator was assigned to Enderbury. It is interesting to note that the leader who handled all radio communication with Canton Island with phone did not miss a schedule during the past period. This system of operation is to be continued for this island as very satisfactory communication is maintained. The TANEY departed the evening of the 13th, returning to Canton. The TANEY remained at Canton throughout the 14th, departing after the U. S. Navy flight arrived at Canton. The TANEY departed Canton the evening of the 14th, en route Jarvis Island. The amount of hydrogen and gasoline was considerably increased at Canton, Howland and Jarvis so that a sufficient quantity would be on hand to provide all weather observations and upper air soundings received for routeine Pan American flights and daily weather schedules and any flights of aircraft into that area not anticipated at this time.

The TANEY arrived early Sunday morning at Jarvis Island on March 17. All stores and equipment were landed during the morning. A complete inspection of the colony was made by the medical officer and found to be excellent. The condition of this colony was exceedingly good. Considerable difficulty was experienced with the radio equipment of this island. The transmitter was in excellent condition and operative. The radio receiver was completely out of commission. No replacement in personnel was made at this island. The TANEY remained at Jarvis throughout the day attempting to repair the radio receiver. During this day, the 17th of

March, Frederick Wilhelm relieved at Enderbury was taken sick, and was placed under care of the medical officer of the TANEY. The TANEY remained throughout the morning of the 18th at Jarvis Island. The radio receiver could not be repaired and the receiver purchased for this island could not be used because of the peculiarity of the circuit. A radio receiver was borrowed from the Coast Guard Cutter TANEY and will be returned on the next cruise. During this day, the physical condition of Frederick Wilhelm did not improve. After a conference with the medical officer of the TANEY and the Commanding Officer, TANEY, it was decided to proceed with the utmost dispatch to Honolulu to hospitalize the patient. The radio receiver purchased for this island will be modified and used the next trip on one of the islands needing it.

On 20 March the condition of the ill colonist, Frederick Wilhelm, improved to such an extent that his condition was not termed serious, therefore, the vessel's course was altered for Palmyra Island. The TANEY arrived at Palmyra the early evening of the 20th and remained until 6:00 p.m. 21st, at which time the course was set for Honolulu. In view of the fact that Palmyra is now under naval jurisdiction no comment will be offered.

The TANEY arrived Honolulu 2:00 p.m. the 23rd of March, thus terminating the Eighteenth Cruise.

Mr. Ashley Browne, Extension Horticulturist, University of Hawaii, who was a member of the expeditionary party contributed valuable advice and information to all of the island personnel concerning setting out of trees and plants. His efforts on the Seventeenth Cruise were amply rewarded by the condition of plants and trees set out at that time. The careful tending by the colonists added their growth. Rainfall has been plentiful at all of the five islands. Progress is truly being made on this phase of the activities on the Equatorial Islands. A copy of Mr. Browne's report is being enclosed in its entirety for the information of the Department. In referring to his report which meets with the full approval of this office and hearty support should be given to Mr. Browne's ideas and efforts.

In referring to his recommendations concerning water conservation I would not recommend the construction of cisterns until the future of the islands is definitely established, but if the occupancy of all of the islands is to be continued over a long period of years I approve his recommendations and recommend that this project be kept in mind. The size of the cisterns recommended by Mr. Browne is such that a sufficient quantity of water will be stored to meet all needs. An economical filter can be placed on each island to purify the water used from this cistern for drinking purposes. The construction of this cistern could be accomplished by the island personnel. It is recommended that the next cruise depart Honolulu about the second week of July, 1940

Acting Field Representative

April 2, 1940

Mr. Frank T. Kenner
Representative, Department of the Interior
Federal Building, Honolulu

April 2-1940

My dear Mr. Kenner:

The following report is submitted upon my findings and recommendations concerning tree planting programs on the American Equatorial islands as observed during the cruise of the Coastguard Cutter Taney, March 4 to 24, 1940 inclusive.

I. Summary of Conditions as Found

A. Howland Island -

General rainfall during the period October 1939 to March 1940 has been highly favorable to the growth of shade producing trees and shrubs which were set out during preceding periods. Particularly outstanding was the growth which has been made by the ironwoods in the rear of the camp. These trees have now reached a height of from 12 to 18 feet and I believe it can reasonably be anticipated that if the planting be continued along its present line that this double row will develop a satisfactory windbreak. As evidence of the ability of this species to adapt itself to the rigorous environment of Howland island, it can be stated that the trees have made from 3 to 4 feet of growth in the preceding 4 months and that they had likewise started to fruit. It would be only a matter of months until ripe seeds can be secured on Howland island. Coconut palms planted near the buildings are maintaining a highly satisfactory rate of growth. The kamani tree, a broad leafed evergreen, was found to have increased its size by approximately one third. A single vitex bush which had been planted on the island approximately two years ago in a very adverse position has not only maintained life but has increased its size about six fold which would seem to indicate that the species might be adapted for low windbreak purposes. A double row of Milo which was planted sometime ago in front of the camp has been able to maintain itself, produce blossoms and a few seeds, but growth has been extremely restricted. It is felt that the species is not suitable for conditions on Howland island and probably the others as well and consequently is not recommended for future extensive use.

B. Baker Island

No landing was possible on Baker island except for those actually engaged in the transfer of supplies. This report upon the condition of plants is therefore second hand and consists of statements made to me by the Hawaiian boys who were ashore. These men reported that all plants and trees on Baker have done extremely well, that there had been a very gratifying rate of growth and that there had been practically no losses. Judging by their comparison of growth conditions on this island and those which I was able to visit, the conditions on Baker might be expected to have been better than on any of the others.

C. Canton Island

During the October cruise both plants and soil were left on Canton in charge of the Pan American Airways representative who agreed to use the materials for the joint benefit of both the colonists and the Airways. A

highly satisfactory condition was found, showing that plants taken from Honolulu had been intelligently cared for and that, with reasonable attention, they had been able to adapt themselves to their environment. Two Sea grape plants, each about 7 feet high, which were delivered in October were found to have made a highly satisfactory rate of new growth with an abundance of strong, vigorous foliage. It is considered that this observation is significant since the species possesses numerous characteristics which would make it highly desirable for planting purposes throughout the Line islands. The plant possesses a large, bushy habit of growth, is capable of adapting itself to either an erect or trailing habit, its foliage is wide, thick, glossy green and highly resistant to wind damage. The plant is drought resistant to a remarkable degree and is tolerant to considerable quantities of salt in both the soil and on the foliage. It gives every indication of being adapted to situations exposed to constant winds, low rainfall and intense heat.

Kamani trees delivered on previous cruises had made excellent growth and showed evidence of having effectively established themselves. Ironwoods were noted to have made from 2 to 4 or 5 feet of growth. Tournefortia is an endemic plant and consequently adapted to the environment, therefore where specimens had been transplanted and given subsequent care they were giving satisfactory evidence of adjusting themselves to their new conditions. Coconut palms were apparently somewhat slower in adjusting themselves, but with proper preparation and a little subsequent attention to the planting place, I believe that these can be successfully established. The critical period will probably be during the first 6 months, after which time they should be able to maintain themselves with relatively little care. A small number of crown flowers delivered in one quart cans on the October cruise were found to have increased their size by about double and were in full bloom at the time of the visit in March. While the species was able to maintain itself in a satisfactory manner during the winter months, there is still some question of doubt as to its ability to withstand long periods of intense drought and heat. Should it be able to maintain itself, the species would prove highly desirable in the general landscape plans for Canton island and possibly others as well. It is interesting to report that one of the employees of the Pan American Airways has succeeded in producing satisfactory cucumbers and watermelons. Both of these species of vegetables require bees for their normal pollination, but in the absence of these insects on Canton island a camels-hair brush had proved highly satisfactory in the necessary transfer of pollen which effected the normal set of fruits.

D. Enderbury Island

On this island ironwood and Kamani were apparently making satisfactory growth. Some seeds were found to be setting on the ironwoods and the young palms were making satisfactory headway. A large native tournefortia bush in front of the colonists' quarters has apparently not improved its condition since October. In fact it seems as though this large shrub was in poorer condition than 4 months ago. I do not believe that very much can be done to resuscitate it. If an improvement takes place it will probably be the result of abundant rainfall and inherent vigor. While the actual maximum age of the tournefortia bush is not known, I believe that it can be considered as a plant of relatively short life, thus the shrub may have reached full maturity and now be in a slow condition of decline. On the whole, condition of plants sent to the island on previous cruises was satisfactory.

E. Jarvis Island

Of the two flats of young ironwood seedlings which were left at Jarvis in October, only one transplant has survived. At the time of delivery to Jarvis the plants were not in the best condition and therefore the colonists cannot be held responsible for the disappointing condition which was found. Coconut palms, older ironwoods and other plants delivered on previous cruises were mostly maintaining a satisfactory condition or showed definite evidence of new growth. Much more planting should be done on this island, but as recommended in the report of October, 1939, it should be restricted to the limitations of available water needed for satisfactory establishment.

II. Disposition of plants carried from Honolulu on the March 1940 cruise:

Howland Island -

Ironwoods	- 50 (in individual 1 qt. cans)	
Tournefortia	- 50 (in individual 1 qt. cans)	
Coconut palms	- 10 (5-7 feet high in 5 gal. cans)	
Bush beans	- 1 pound, variety Bountiful	Total 110
Carrot seed	- 1 package, variety Imperator	
Squash seed	- 1 package, variety Zucchini	

Jarvis Island -

Ironwood	- 50 (in individual 1 qt. cans)	
Tournefortia	- 50 (in individual 1 qt. cans)	Total 110
Coconut palms	- 10 (5-7 feet high in 5 gal. cans)	

Canton Island -

Pandanus	- 10 (1-2 ft. in 1 gal. cans)	
Plumeria	- 50 cuttings - 18 inches	
Tamarisk	- 50 cuttings - 12-18 inches	
Ironwood	- 200 (in 1 qt. cans)	
Kamani (true)	- 11 (in 1 qt. cans)	
Hau	- 20 (18-24 inches in 1 qt. cans)	Total 920
Coconut palms	- 39 (5-7 feet high in 5 gal. cans)	
Paper Bark	- 40 (10-14 inches in 1 qt. cans)	
Tournefortia	- 400 (2-4 inches in 1 qt. cans)	
Sea Grape	- 100 (2-4 inches in 1 qt. cans)	

In addition to the foregoing list of plants, 15 tons of soil in sacks was left with Pan American Airways with instructions that the unopened sacks be spread upon the sand in order that the soil might be thoroughly baked by the intense heat. Twenty-four cans (5 gal.) of soil were left at Jarvis Island.

III. Recommendations

A. Plants and Materials

In view of the satisfactory growth and the general conditions of thrift, it would seem advisable to continue the transfer of living plant material from Honolulu to the American Equatorial islands. Most satisfactory

results seemed to follow where plants are firmly established in individual cans before leaving Hawaii. The transfer of seedling plants in flats is not recommended. Major emphasis should be placed upon the establishment of those species which are adapted to the trying environmental conditions in the Equatorial islands. At present this list consists of (1) ironwood (lowland type, (2) Kamani (both true and false), (3) tournefortia, (4) vitex, (5) coconut palms (where the seedlings can be given some protection until established) and (5) sea grape.

B. Planting Program

As recommended in the October 1939 report, major emphasis should be continued on the establishment of satisfactory windbreaks consisting of at least 3 lines of trees with individuals planted alternately. Interplanting the two windward rows with tournefortia or vitex should afford protection to the leeward row and thus develop a low but rather dense barrier to the prevailing wind. A satisfactory progress has been made and instructions were left on each island for care and maintenance.

C. Water Conservation

The need of conserving all the fresh water possible has been discussed in previous reports. The situation and recommendations in this regard have not changed. It is, however, again emphasized that every reasonable measure should be taken to conserve all the water that can be gathered upon the islands. It was found on each island that all the reserve drums capable of holding water had been filled but that in some cases a considerable number of drums were found to be unsuitable and large quantities of rain water had thus been allowed to escape. It is recommended that plans be made for the construction of a cistern on each island. These cisterns could be constructed either under the rainshed or to one side and then at some future date roofed with an additional rainshed. The structures should be built to a capacity of approximately 2500 gallons (4 feet deep and $10\frac{1}{2}$ feet across - inside dimensions) using coral slabs for floor and siding. These slabs should be set in concrete mortar such as was used in the construction of the lighthouses and the floors and side walls be coated with water-proof cement. The construction of such cisterns involves no complicated engineering problem or undue expense, and the water so conserved would maintain its freshness and flavor for a longer period of time than that stored in steel containers. There would be the added advantage of no rusting which imparts unpleasant color and taste. Such a circular cistern as outlined above could be roofed and ventilated with screened ventilators. The volume of water which might reasonably be expected from such a rainshed are as follows:

Precipitation (inches)	Equivalent Gallons per 1000 sq. ft of Drainage Surface
0.01	6.2327
0.05	31.1753
0.25	155.853
0.50	311.706
0.75	467.56
1.00	623.27
1.50	935.12
2.00	1246.54
2.50	1558.25
3.00	1870.24
4.00	2493.51
5.00	3116.89

D. Soils

The Department of the Interior is probably justified in transporting soil from Honolulu to the Equatorial islands where small quantities are involved, but it does not seem justifiable to transport large volumes except in the case of Canton island. Soils taken from Honolulu should, upon arrival at destination, be exposed to the direct sunlight for 2 to 3 weeks before being used. This period of exposure is believed to be sufficient to destroy harmful soil organisms which might have been transported. Soil carried to the Equatorial islands should be used only in the establishment of seedling plants or transplants. It should be used in holes previously excavated and filled with local top material in the center of which the transported soil should be placed. This then would become the bed in which the young seedling would be established. Transported soil is intended to be used as the starter medium because of its greater water holding capacity and as a blending agent to assist the seedling in ultimately adjusting itself to the new soil conditions which it must encounter on the Equatorial islands. It does not seem justifiable to anticipate the transfer of sufficient volumes of soil to be used in establishing beds or plots. Its best utilization would appear to be in small undiluted quantities as described above or when mixed with small quantities of local top material.

E. Fumigation and Inspection

Future shipments of plants from Honolulu to any of the Equatorial islands should be given careful inspection to be sure of their freedom from noxious insects or diseases. The importance of maintaining clean plants under the conditions now found on the islands should be again emphasized. Steps have been taken to assure inspection by the Territorial Board of Agriculture and Forestry and precautionary fumigation prior to the shipment of future lots of plant materials.

F. Cooperation on Canton Island

It is believed that the present policy of cooperation now existing between the Department of the Interior and the Pan American Airways on Canton island should be fostered in every way possible. Insofar as the program of landscaping on this island is concerned, the greatest benefit will probably follow where the present policy is maintained. Uniformity of planting, constant regular maintenance and best development can be assured by a continuation of the existing policy.

G. Policy

A clear-cut expression of policy by the Department of the Interior as to its ultimate plans for the development and utilization of the American Equatorial islands would be of inestimable value in determining what plan should be followed at this time in order to achieve the greatest ultimate benefits. If all islands are to be maintained, equal attention should be given to the planting programs on all islands.

IV. Conclusions

I am pleased to report that in discussing planting plans and progress with the colonists on the several islands, these men expressed a keen and intelligent interest in the program. In three cases the colonists asked for vegetable seeds in order that they might start producing some green foods. The current trial on Howland island where seeds of beans, carrots, and squash were left, together with the information from Canton may provide sufficient justification for taking steps along these lines. If the cisterns recommended above can be built, the additional water thus saved would probably justify some effort being spent in the production of a few of the hardier vegetables. It is not believed practicable to recommend the general use of hydroponics at this time. While this system of vegetable production has proven of value on Midway, it must be remembered that the work was under the constant supervision of a highly trained plant physiologist equipped with an abundance of experience in this highly technical field. The specialized technique necessary for success in hydroponics would seem to discourage its adoption on the islands except where it could be under the maintenance of a competently trained operator.

Respectfully submitted,

Ashley C. Browne
Extension Horticulturist

cc Mr. Kenner (3)
Mr. Warner (1)
Mr. Lueder (1)
Mr. Mullahey, Canton Island (1)
Board of Agri. and Forestry (1)

Agricultural Extension Service
University of Hawaii
and
United States Department of Agriculture
Cooperating

SUPPLY LISTS - 18TH CRUISE

Items listed were duly landed on Howland, Baker, Canton, Enderbury and Jarvis Islands as noted in narrative.

EQUIPMENT - 18TH CRUISE

	Item	"C"	"E"	"B"	"H"	"J"	TOTAL
1.	Kerosene, 5 gal. cans	50	30	50	70	50	230
2.	Gasoline, 35 gal. drum, white	6	4	3	5	10	26
3.	Hydrogen (see Navy letter Oct. 5 re cylinders)	30			20	25	75
4.	Matches, Gold Medal 10's	24	24	24	24	24	120
5.	Record books	1	1	1	1	1	5
6.	Dish towels, Navy Standard, dozens	1	1	1	1	1	5
7.	Dish cloths, Navy Standard, dozens	1	1	1	1	1	5
8.	Pencils, 2 H., boxes of 1 dozen each	2	2	2	2	2	10
9.	Cement, Portland, bags		6			10	16
10.	Pillow cases, Navy Standard, dozens				½	½	1
11.	Bed sheets	4	4	4	4	4	20
12.	Flashlights	2			2	2	6
13.	Batteries, flashlight, cartons	2			2	2	6
14.	Bulbs, flashlight, dozens					1	1
15.	Paper, roofing, rolls				1		1
16.	Paint, dark gray, gals	5		5		5	15
17.	Paint, light gray, gals			5		5	10
18.	Paint, inside, white, gals			5		5	10
19.	Paint, outside, white, gals	5					5
20.	Brooms	1	1	1	1	1	5
21.	Sandpaper, medium, dozens		½				½
22.	Lime, bags			1	2		3
23.	Clocks, Navy Bulkhead	1	1	1	1	1	5
24.	Stop watches	1			1	1	3
25.	Teaspoons		6				6
26.	Drums, water	12	12	12	12	12	60
27.	Tissue, toilet, case				1		1

	Item	"C"	"E"	"B"	"H"	"J"	TOTAL
28.	Files, 3 cornere 6 inch, medium	:		1	1		3
29.	Files, flat, 8 inch, coarse	1	1		1		3
30.	Files, flat, 8 inch, medium	1	1	1	1	1	4
31.	Files, flat, 8 inch, fine		1				1
32.	Hydrometer		1				1
33.	Wrench, crescent, 8 inch	1	1				2
34.	Wrench, crescent, 6 inch	1					1
35.	Openers, can, wall mounted	1	1	1	1	1	5
36.	Lumber, pieces, 2" x 4" x 18'				2		2
37.	Lumber, pieces, 2" x 12" x15'				2		2
38.	Lumber, pieces, 1" x 1" x 20'				15		15
39.	Funnels, 6"	2			1		3
40.	Creolin flit				1	1	2
41.	Expansion bit, 7/8 3"			2			2
42.	Tape, carpenters, steel, 30 feet				1		1
43.	Hoe				1		1
44.	Saw, cross cut				1		1
45.	Penetrating oil, gals.				1		1
46.	Brass polish, cans				1		1
47.	Copper polish, cans				1		1
48.	Bamboo rake				1		1
49.	House mops				1		1
50.	Soap, washing, cases				½	½	1
51.	Babbits, cans				6		6
52.	Trowel, cement				1		1
53.	Handles,hammer, standard claw		1				1
54.	Hacksaw blades		12				12
55.	Teaspoons		6				6
56.	Porcelain bowls, cups, each		4				8
57.	Braided line, not manila, ½", feet		300				300

FOOD SUPPLIES - 18TH CRUIS

Item	"C"	"E"	"B"	"H"	"J"	TOTAL
1. Apricots, halves, 24/2's Libby's, cases		1	1	1	1	4
2. Beans, pork and, 24/16 oz., cases		1	1	1	1	4
3. Beef, corned, 12 oz., tins		90	90	90	90	360
4. Beef stew, 24/24 oz., tins		24	24	24	24	96
5. Beets, sliced, fancy, 20 oz., tins		24	24	24	24	96
6. Bisquick Mix, flour, 12/40 oz., pkgs		10	10	10	10	40
7. Butter, canned, cases		½	½	½	½	2
8. Catsup, 24/14 oz., bottles		10	10	10	10	40
9. Chili Con Carne with Beans, 24/11 oz., cases		1	1	1	1	4
10. Cocoa, Breakfast, Herseys, 24/8 oz., tins		4	4	4	4	16
11. Coffee, Kona, 48/1 lb., pkgs		8	8		8	24
12. Corn Beef Hash, 24/10 oz., tins		36	36	36	36	144
13. Corn, fancy, cream style, 34/2's, tins		24	24	24	24	96
14. Corn Niblets, 24/12 oz., cases		1	1	1	1	4
15. Cereal, Corn Flakes, pkgs		12	12	12	12	48
16. Crackers, saloon pilot, 16 oz., lbs		40	40	40	40	160
17. Extract, vanilla, 2 oz., bottles		2	2	2	2	8
18. Flour, wheat, Pillsbury's 9.8			4	4	4	12
19. Fruit salad, fancy, 8 oz., cases	½	2	2	2	2	8½
20. Garlic, lbs		1	1	1	1	4
21. Ginger root		1	1	1	1	4
22. Jelly, jams, assorted		12	12	12	12	48
23. Juice, grape, Welch, 24 pts., cases	½	½	½	½	½	2½
24. Juice, grapefruit, 12 oz., cases	½	½	½	½	½	2½
25. Juice, pineapple, Dole, 24/18 oz., cases	1½	3	3	3	3	13½
26. Macaroni, dry, Fontana, 24/8 oz., pkgs		8	8	8	8	32

Item	"	"E"	"B"	"H"	"J"	TOTAL
27. Milk, evaporated, Carnation, 48/1's., cases		2	2	2	2	8
28. Milk, powdered, 5 lbs., cans		2	2	2	2	8
29. Peaches, cling		2	2	2	2	8
30. Peaches, dried, lbs.		5	5	5	5	20
31. Peas, tiny, sugar, 24/2, cases		1	1	1	1	4
32. Pickles, Chow Chow (with mustard)		2	2	2	2	8
33. Pickles, mixed, sweet 24/16 oz., bottles		2	2	2	2	4
34. Pineapple, fancy, sliced, Dole, 24/2's cases		1	1	1	1	4
35. Poi, canned, 1 lb. 12 oz., Haw'n Royalty, tins			240	240	240	720
36. Powder, baking, Royal, 24/8 oz., cans		2	2	2	2	8
37. Prunes, dried, lbs		5	5	5	5	20
38. Rice, 100 lb., bags			1	1	1	3
39. Salad oil, qts.		3	3	3	3	12
40. Salad Dressing, Mayonnaise, qts.		3	3	3	3	12
41. Salmon, 48/1's, cases		1	1	1	1	4
42. Salt, Hawaiian				1		1
43. Salt, table, iodized, 2 lbs., Ardens, pkgs		1	1	1	1	4
44. Sausage, Vienna, 1 lb. cans, cases		1	1	1	1	4
45. Shortening (crisco) or equal		2	2	2		6
46. Soda, baking, lbs.		1	1	1	1	4
47. Soup, chicken gumbo, Campbells, 48/1's, tins		24	24	24	24	96
48. Soup, vegetables, Campbells, 48/1's tins		24	24	24	24	96
49. Soyu bean sauce, qts		2	2	2	2	8
50. Spaghetti, cooked, in tins, cases		2	2	2	2	8
51. Starch, corn, lbs.		2	2	2	2	8
52. Sugar, white, 100 lbs., bags			$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{2}$
53. Tea, black, English, 8 oz., pkgs			2	2	2	6

	Item	"E"	"B"	"H"	"J"	TOTAL
54.	Tomato juice, 24/18, cases	1	1	1	1	4
55.	Tomato sauce, 7½ oz., Exquisite, tins	36	36	36	36	144
56.	Tomatoes, solid pack, tins, cases	1	1	1	1	4
57.	Tongue, cooked, lunch, Star 24/6, cases	1	1	1	1	4
58.	Vegetable for salad, 48/8 oz., tins	36	36	36	36	144
59.	Vinegar, cider, 16 oz., bottles	2	2	2	2	8
60.	Curry powder, cans	1	1	1	1	4

TO BE PACKED FOR CHILL ROOM

61.	Ham, sweet pickled, cured	2	2	2	2	8
62.	Onions, dry, bag 100 lbs.	1	1	1	1	4
63.	Potatoes, Irish, 100 lb. bags	1	1	1	1	4
64.	Potatoes, sweet, 100 lb., bags	1	1	1	1	4
65.	Sausage, Salami, dried, 3 to 4 lbs each	1	1	1	1	4
66.	Bacon, sweet pickled, cured, slabs	4	4	4	4	16
67.	Beef, jerked, lbs.	2	2	2	2	8
68.	Cheese, processed, American, lbs.	2	2	2	2	8
69.	Yeast, lbs.	1	1	1	1	4