

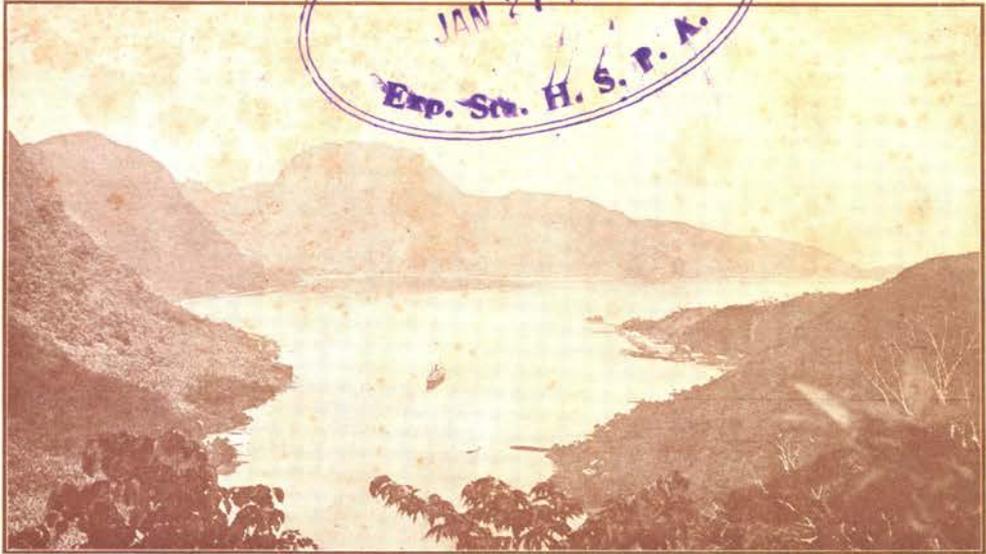
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MID-PACIFIC MAGAZINE

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The beautiful harbor of Pago Pago, American Samoa.

The Mid-Pacific Magazine

CONDUCTED BY ALEXANDER HUME FORD

Volume XLV

Number 1

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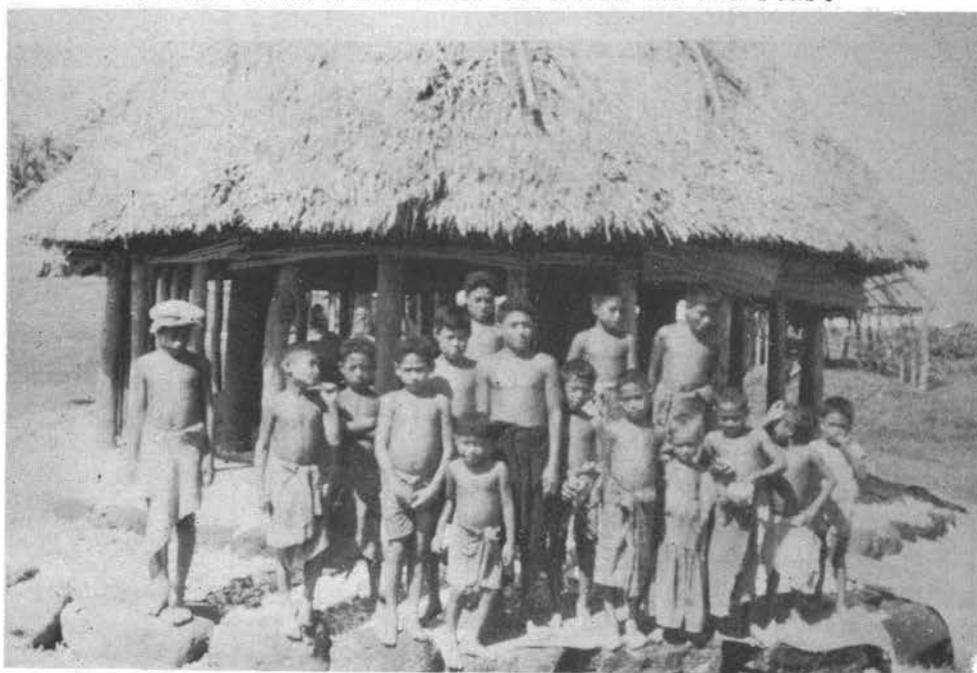
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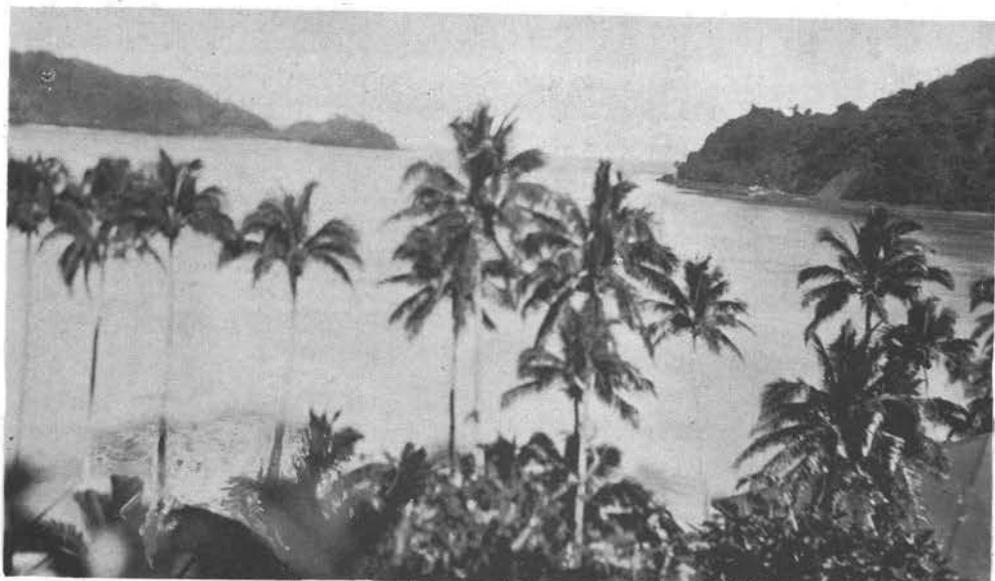
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Only Oberammergau excels the dramatization of the "Passion Play" as presented by the Samoans. The little child here shown was one of the "Passion Play" performers. The Catholic Girls' School at Leone is shown in the rear.



A typical group of Samoan boys. Girls and boys do not play together in Samoa.



A view of the entrance of Pago Pago bay and harbor. Taken from the lanai of the "Governor's Mansion".



A "long boat", frequently used for deep sea transportation-- 50 ft. long by 4 ft. abeam, with no outriggers. It is made of hewn planking, rigged and tied together, and is very seaworthy, balance being maintained by the long oars. The "coxswain" sits at the bow and beats time on a rolled mat or a tin can for the stroke and singing.



Jack Waterhouse and some of his Samoan friends acquired on the visit of the Barstow Committee in July, 1932. The lava-lava worn by the boys is their customary dress.



Girls of the London Mission Society Girls' School at Ataulowa served refreshments on this beautiful outlook point to the members of the Barstow Committee.



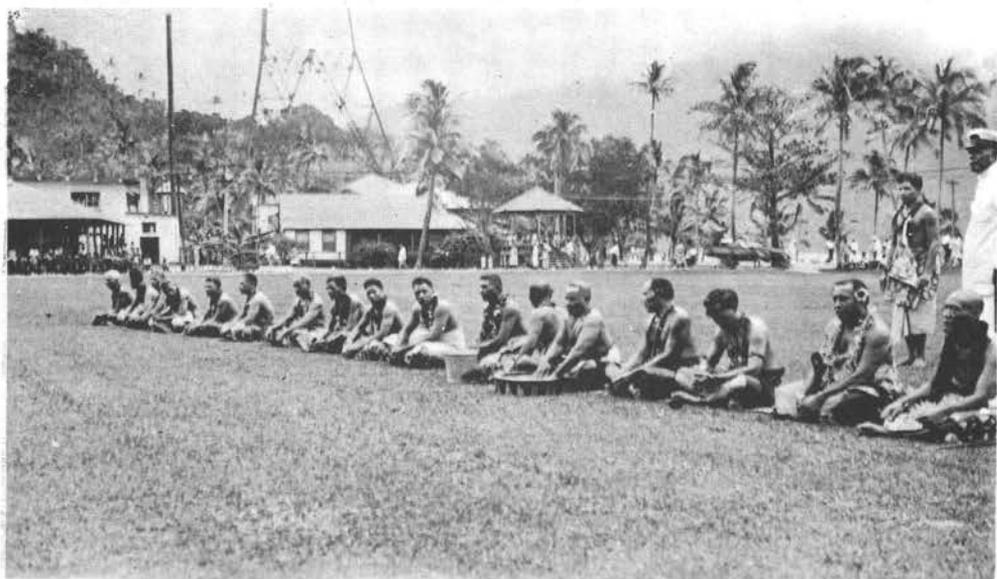
A church with bamboo thatched walls on the Island of Ofu.



The London Missionary Society Church at Leone, built by Chief Fepuleai Ripley and carpenters' guild. Samoan fales or houses are shown nearby.



A siva-siva team ready to begin its dance. Quarters of naval officers are shown among the coconut palms.



This row of chiefs sat as attendants without the fale tele during the special kava ceremony for retiring Governor Lincoln and incoming Governor Landenberger. Note also the evidences of modern Samoa in wireless masks, buildings, and village policeman in uniform.



A Samoan fale or house in process of construction by carpenters' guild or tufunga. Temporary scaffolding is shown.



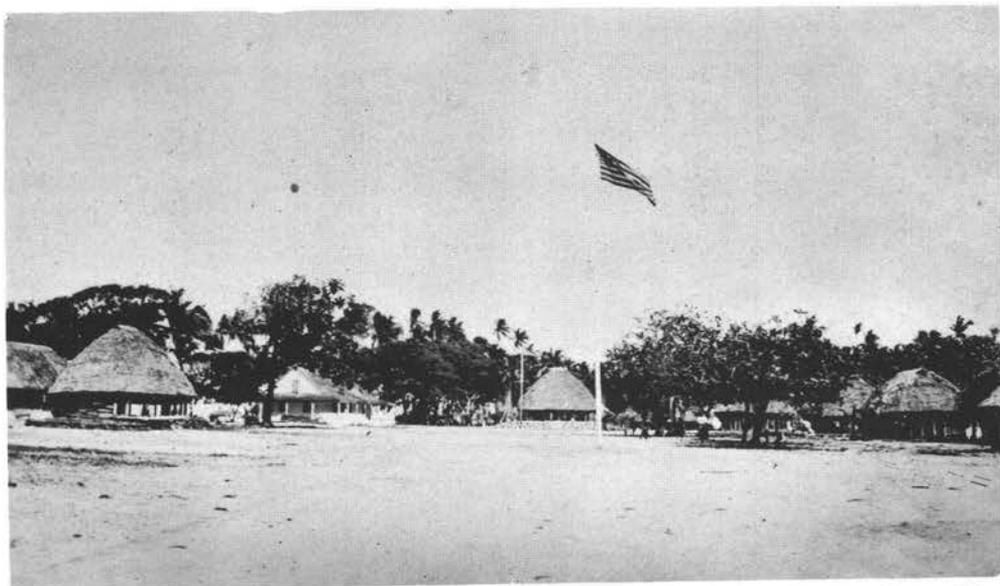
A typical Samoan fale, with the present day Samoan garments shown on the residents in the foreground. All Samoan fales have the elongated ridge as appears in the side view of the second house. The raised pebblestone-curbed area around the house is the paepae.



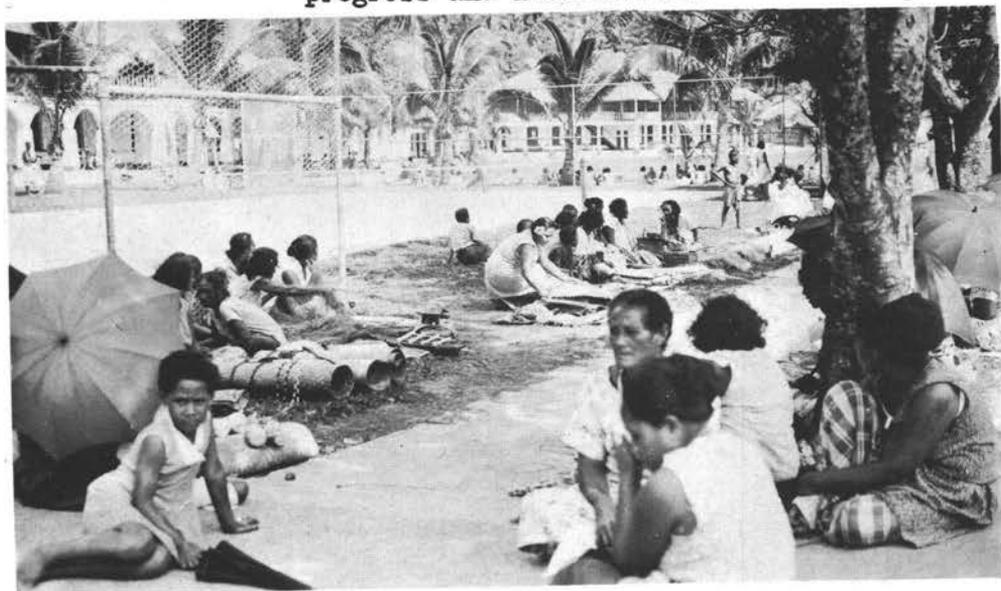
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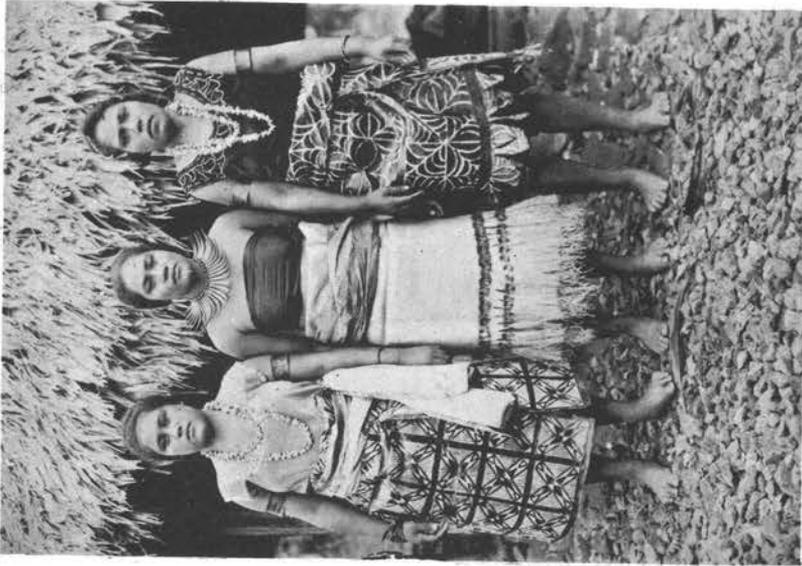
A women's siva-siva. These dances have striking tempo, are amazingly well performed in unison, and have a great variety of rapid movements.



The village of Nuuli, the seat of the Mau. The house beyond the flag pole is the gathering place of the Mau organization. The modern house is the home of the village pastor, or Faifeau who in this rare case has deemed such a house a symbol of progress and advancement.



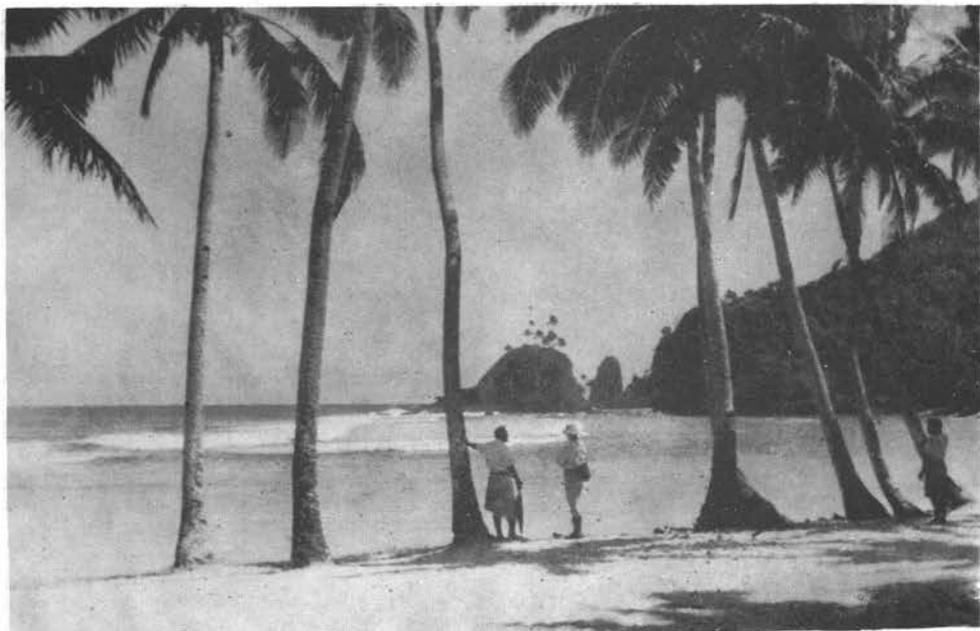
A common scene whenever the trans-Pacific boats touch at Pago Pago. The malae or village common is covered with crafts people displaying their wares--mats, siapos, head knives, kava bowls, falas, ulas, etc., etc.



Three special dancers who entertained the Barstow Committee at Malaeloa. The one in the center, wearing a fine mat and 'ula lei, (whale ivory necklace), is the village taupou.



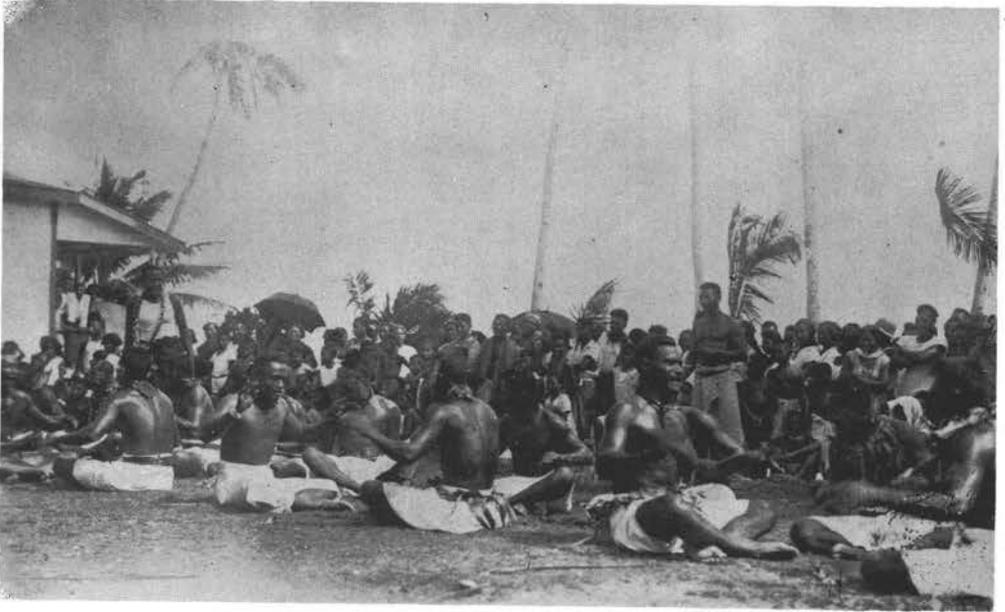
A chief's little daughter. She wears the ceremonial tuinga head-dress.



Mr. Albert F. Judd, and the Barstow Committee's talking chief, Fepuleai Ripley, awaiting transportation for the Earstow malaga. Mr. Judd is chairman of the Barstow Committee.



Boys coming to a village "fountain". Water is piped from mountain streams and the village supply comes in the condition here shown. Usually the "fountains" are over a concrete basin in which the people bathe and wash their clothes.



A men's siva-siva team in action.



Samoan preparing copra for drying.



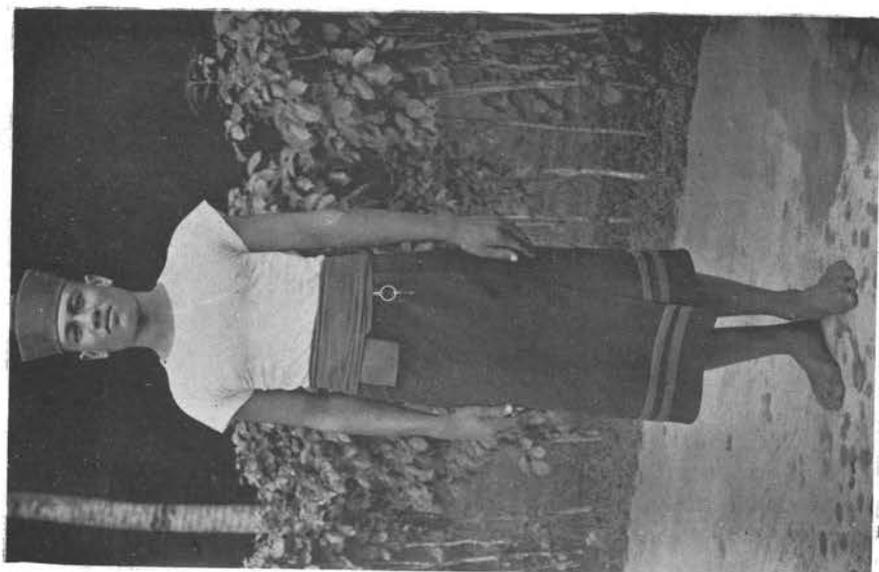
View across Leone Bay.



A Samoan girl preparing kava--rather informally and out-of-doors--for a group of carpenters' guildsmen while they labor on the construction of a new house.



The first Maloota--now called Fua since he gave his greater title to a younger man. He is a chief of Malaeloa.



A Fita fita guardsman. He has the status of a navy enlisted man, with duty in American Samoa and surrounding waters only.



Samoa boys with typical coconut leaf baskets on carrying poles bearing copra for drying on the ground about the fale.



Chiefs in attendance at a special kava ceremony at Nuuuli. The fale tele shown here is the meeting place of the Mau, Samoan political organization largely independent of the Naval Government--the Malo. Note the raised platforms of the fale tele, denoting a house of highest rank.



Some of the members of the Barstow Committee, with Samoan chiefs, await the approaching ta'alolo or ceremonial presentation of gifts to the Barstow visiting party (malaga) at Olosega.



Members of the Barstow Committee inspecting the extensive wet land taro plantings at Aumuu. From the sale of this taro and of the mats, the people of Aumuu netted \$30,000 with which to build a large, modern, electrically-lighted church.



The gathering of copra, the dried meat of coconuts, constitutes the chief industry of the Samoan Islands.

A Charitable Trust Makes Plans to Serve a Primitive People

By FRANK E. MIDKIFF,
President, Kamehameha Schools

(The following unofficial paper on the purposes of the Frederic Duclos Barstow Foundation for the people of American Samoa was read before the Social Science Association of Honolulu.)

The Frederic Duclos Barstow Foundation is a charitable trust for the benefit of the people of American Samoa. This trust was established under the inspiration of a young man who was very much interested in the Samoan people but without any knowledge of the hopes or purposes of the one in whose honor it is

founded. The nature of the services to be rendered by the Foundation has been left entirely to the discretion of a committee of five Honolulu men.

Frederic Duclos Barstow, for whom the Foundation is named, was a conscientious young Yale undergraduate who left college, before he finished his course, to enter the World War. He was seriously injured and shell-shocked during the war. He was the son of wealthy and philanthropic parents and was himself very much inclined toward philan-

thropy. Due to his physical and nervous condition he was advised to visit the South Seas in search of health. During these visits he became so impressed with the Samoan people that he induced his parents to meet him in Honolulu to talk of coöperating with him in doing something for the Samoans. While his parents were with him here he suddenly became seriously ill and died before he had intimated just what he hoped would be done.

Mr. and Mrs. William S. Barstow, the parents, founded this trust, thereby perpetuating their son's spirit and personality. The deed of trust names the presidents of Punahou School, the Kamehameha Schools, and the Bishop Trust Company, Limited, as the permanent members of the committee and the Bishop Trust Company, Limited, as the trustee; it provides that the three permanent members shall appoint two other members to make a committee of five; Mr. Albert F. Judd and Dr. Peter Buck of the Bishop Museum were selected as the other two members, and Mr. Judd was made chairman of the committee, he having drawn up the deed of trust.

Careful study of all the available references on Samoa only partially enlightened the committee in planning and convinced the members of the committee that it would be necessary for them to make a visit to Samoa to see first hand the conditions that obtain there and to determine the needs that the Foundation might satisfy.

Accordingly a trip was made during the past summer, from July 7 to August 11, during which period twenty-six days were spent in Samoa. Three members of the committee made the trip, Mr. Judd, Judge Frear and Mr. Midkiff; and Mr. Edwin R. Embree, president of the Julius Rosenwald Fund, went along as a member of the visiting committee. Others in this party of ten were Mrs. Frear, Mrs. Midkiff, Albert F. Judd III, John T. Waterhouse, Jr., Miss Edwina

Embree and Miss Margaret Sargent, the last named being the secretary of the Julius Rosenwald Fund.

This visiting committee chose to spend nineteen of the twenty-six days living among the Samoan people right in their houses in their villages. The remaining portion of the time was spent in the homes of the naval officers at Pago Pago in order to facilitate conferences with government officials.

The Procedures of the Committee: The committee carried on its investigations through the method of visits from village to village, these visits being known as *malagas*. A typical *malaga* would reveal our party of ten accompanied by a retinue of talking chiefs, carriers and aides, sedately marching single file through the trails to the village. We were all dressed in white and carried black umbrellas. The men wore sun helmets. We imagined that we "cut quite a swath." On arriving in the village, we were welcomed with solemn dignity by the chiefs, and shown to appropriate seats of honor in the *fale tele*, or great house. Drinking *kava* was first in order, this ceremony always including long speeches of thanks to God for the success of the *malaga*, for the coming of the friends, and prayer for the ultimate success of the purpose of the party.

Then followed the *fono* or council. The chiefs of the village and the members of our own committee spoke to each other through their respective talking chiefs. The committee always stated its mission and asked the direct question of the chiefs as to what they desired their young men and women to become and what type of education they wished to have to secure these ends. We explained, usually employing parables to make our meaning clear, that there are three ways along which education may go: first, back toward the Samoa of 200 years ago, eliminating all western influences (though this way we felt to be an impossible one); second, radically ahead to-

ward the new western ways, dropping everything of the old ways of *faa* Samoa; third, a middle course, conserving the good of the old and building thereon very gradually those things from western culture that have been proved to be good. In general, we were all impressed with the familiarity at deliberation and with the intelligence and wisdom of these chiefs. The Samoan chiefs unanimously chose the third way.

Following the first *fono* would come a feast, arranged for use on the *malae* or village common, which feast differed from the Hawaiian *luau* in that the food was placed in large quantities before the guests. Some of it was only partially cooked, and was not expected to be eaten but merely to be accepted as a gift and placed in the hands of retainers to be taken home, there later to be fully cooked and served. These feasts were, as a rule, very rapid affairs and were more food-distribution ceremonies than occasions for filling one's self with food. After the feast there would be held an hour's entertainment of singing, *siva sivas*, and knife swinging. Then singing in the distance would announce the arrival of a party bearing gifts, a custom among the Samoans known as *talolo*. With due ceremonial dances and speeches, gifts of taro, pig, chicken, coconuts, *siapos*, mats, etc., would be placed before the visiting party, and the talking chiefs of our party would enumerate carefully the items given. The idea of this public acknowledgment seems to be that when the *malaga* is returned and the visit repaid, the hosts will make contributions in kind and amount to the *malaga*, repaying the visit. Also, it was customary for us as visitors to bear appropriate gifts on the *malagas*, which gifts, as a rule, consisted of kegs of salt beef, due to the impracticability of our bearing live pigs around the islands. Following this *talolo* a final *fono* would be held, at which time the chiefs would give their answers to the questions we had raised, having, in the mean-

while, duly deliberated among themselves.

During the above ceremonies we sat cross-legged on mats placed on the pebble floor. Not all of us were expert in maintaining this posture, and the writer still feels pains in his knees (and elsewhere) whenever he recalls those prolonged sessions.

These *malagas* were made to all the villages of Samoa except to a very few small and remote ones.

In addition to these formal *malagas*, the committee carried on constant incidental inquiries, visits, and inspections, and held informal *fonos*—always accompanied by *kava* drinking—and conferences with various groups of chiefs. The whole program, in which the islands were carefully covered, was arranged by the chairman of our party, Mr. Judd, since he was quite familiar with the Samoan customs and people, due to his previous visits there.

At different times recourse was had in these *malagas* to transportation by the "long boat," this long boat being fifty feet in length and about four feet abeam, without an outrigger, balance of the boat being maintained by fourteen, sixteen, or more long oars. "Long boats" proved to be very seaworthy and capable of standing the strain of great waves and surf. They are made of hand-hewn boards fastened together with wooden pegs.

The *malagas* of our visiting party were, without exception, very hospitably received; and the Samoans not only counselled as desired with us but also conferred their honorary chiefly titles upon the members of the party.

Findings of the Committee: In general, American Samoa was found to have many similarities to Hawaii. There are five islands of the American Samoa group which were visited by the committee, the small islands of Rose and Swain not having been visited. The largest of these islands is Tutuila, which is nineteen miles long and six miles wide in its



Coconut palms grow on the mountain tops as well as on the plains, and furnish food and drink and also a commercial product in the form of copra, of which the 1931 yield brought an income of \$47,250.

widest portion and has an area of forty-nine square miles, which compares with the island of Kahoolawe in the Hawaiian group, which has an area of sixty-nine square miles. The population of American Samoa is just about 10,000 people. The physical features are similar to those of Hawaii in many ways except that the mountains come down directly to the sea for the most part, and there is practically no flat coastal plain—only small beach areas. The climate is, on the whole, a little warmer and a little more humid than that of Hawaii, since Samoa is about 7° closer to the equator than is Hawaii. The Samoan winter is Hawaii's summer season.

There has been a naval government in American Samoa since 1900, in which year the United States definitely accepted the responsibility for the government of these islands.

The Samoan people were found to be, in many ways, similar to the Hawaiian people, being first-cousin Polynesians, but doubtless resembling the Hawaiians of many decades ago prior to extensive American influences in Hawaii.

The observations of the committee must be merely cursorily scanned on account of time; a complete report would require a considerable volume. The findings will be treated under two headings: first, what we saw of things that were of old Samoa or *faa Samoa*; second, evidences of change and of adjustment to western culture.

The features of old Samoan life, of *faa Samoa*, in so far as material culture is concerned, we found to have been very ably and faithfully described by Dr. Buck in his book, "Samoa Material Culture." There we saw the carpentry guilds, one of the most interesting and unique organizations among Polynesians. The Samoan houses we found particularly adapted to the climate and social conditions of the tropics, and in almost universal use yet in Samoa, which is a very fortunate thing.

We were impressed with the agriculture in Samoa and the fact that there seems to

be an adequate food supply furnished in a method that conserves the soil and the natural resources of the place. The planting being on the unavoidable slopes, there is no clean farming, but dryland taro is grown in areas from which the bush has been removed, but on which there has been no plowing. Coconuts are found to the very tops of the mountains and large supplies of these nuts furnish food and drink for the people and give the only significant commercial venture in the islands, yielding approximately 1500 tons of copra per year, which last year sold at \$31.50 per ton, making an annual income to American Samoa of \$47,250. About \$7000 worth of curios are sold annually to tourists:

Bananas grow in profusion, being both cultivated and wild. The Samoan harvests his bananas and cooks them green, practically never eating the ripened fruit. Of recent years yams and sweet potatoes have been increasing in use and area in Samoa, since these two plants furnish excellent quick food crops after a hurricane has destroyed the oncoming coconut and banana yield. However, the Samoans do not like sweet potatoes as well as taro. Not a great deal of what might be called scientific animal husbandry is shown in connection with raising of swine and cattle; most families have only a pig or two. Very few families have cows; milk has never been used in the past in Samoa for the feeding of even infants, their substitute therefor having been coconut milk. The swine and cattle are both, as a rule, very ordinary stock and show poor care. There are very few horses, though of recent years the number has been increasing slightly. Paddocks for animals are poorly developed and are full of weeds and plants of low nourishing value.

Fishing, of course, is a reliable and constantly used source of food. The Samoans are excellent fishermen, although they are not as active in this industry as might be expected.

It is not uncommon to see a fleet of *bonita* or deep-sea outrigger canoes put out when a flight of sea birds indicates a school of fish. Similarly, fishing in the lagoons and fishing overnight by individuals in their small *paopaos* are commonly practiced. Shellfish, crabs, and lobsters seem to be abundant and in spite of the sanitary system—if it may be called a system—which floods the littoral waters with excreta and human waste, these shellfish do not seem to be a source of contamination, due to the fact that there is a scavenger fish, a form of carp, which consumes the waste in the lagoons and along the shore. This scavenger fish is never molested nor eaten by man. The Samoans, like the Hawaiians, are expert with nets. Very little use is made of fish traps. An interesting revelation of the Samoan's cleverness in the water was when we saw men out in the deep sea, swimming and fishing with pole and line, no canoe being anywhere near them. No fish ponds for fish breeding and culture were observed anywhere in Samoa.

Weaving was found to be a very extensive industry; men make baskets, nets, and *afa* (coconut fiber) string and ropes. Women make mats, which they call *falas*, shades for the Samoan houses, called *polas*, and the fine mats. These fine mats are of very beautiful texture and weave and have always been the wealth of the Samoan—the number of fine mats and the age and history of the mats is a measure of Samoan economic standing. Mats were seen, hand-made of the *lau'ie*, that were as fine in texture as linen cloth. Tapa is made today chiefly for partitions in the *fales* and for sale to tourists. The Samoans call their product *siapo* and, though it is still used as ceremonial dress of the chiefs and *taupous*, is has been superseded by imported cloth for general use in clothing and bed coverings.

The Samoans do not go in for carving to any great extent except in the making of articles of daily use such as *kava* bowls, *afa* blocks and pounders. Wood used in

the construction of houses, canoes, etc., is expertly hewn.

Cooking, in many respects, is similar to that practiced by the Hawaiians. It is carried on in a little outhouse over an open fire or, as is the general custom, in an *umu* similar to the *imu* of the Hawaiians. Food is not as thoroughly cooked by the Samoans, as a rule, as it is by the Hawaiians, but the same methods of heating stones and covering with leaves is practiced.

Transportation by sea is in the *paopao*, *bonita* canoe, and long boat; by land it is on the shoulders of the people. Usually baskets are filled and balanced on the ends of poles which are slung over one's shoulders. There is not a wheel or any sort of wheeled vehicle in the Manu'a district. It was interesting to see the method of transporting the heavier burdens: for example, the great logs for use as house posts. These longs were dragged down the steep slopes by men and then were underslung with cross-carrying poles and raised to the shoulders of a large number of men, who moved along in step, oftentimes at a trot, singing and yelling and enjoying the whole process tremendously. It was not uncommon to see two or three men acting as clowns, shouting, jumping about, whooping it up and occasionally clambering up the backs of the carriers and jumping astride of the log, making a great play of the whole occasion.

Indeed, the foregoing paragraph indicates the Samoan's general attitude toward labor. The Samoans have devised ways of making labor a pleasure; they do not prolong their work so that it becomes drudgery; they do not employ the work rhythms found in western industrial life. They arise at daybreak, eat a little breakfast and start out at their work. From eleven until four, during the heat of the day, they rest. They are far from lazy people, giving examples of prodigious and sustained effort if conditions are such as warrant this. They are accustomed to

singing at their work, and it is very interesting to see a long boat putting out across the bay, filled with singing Samoans, the rhythm being beaten on a mat or Standard Oil tin can. They not infrequently stop work and have *kava* served in ceremonial fashion. The effect of this observance is a splendid indication of what may be done by a little sociable relaxation from arduous work, and it is suggested that western nations might well give consideration to such an idea. Possibly the English in their custom of tea drinking during working hours somewhat approach this excellent custom.

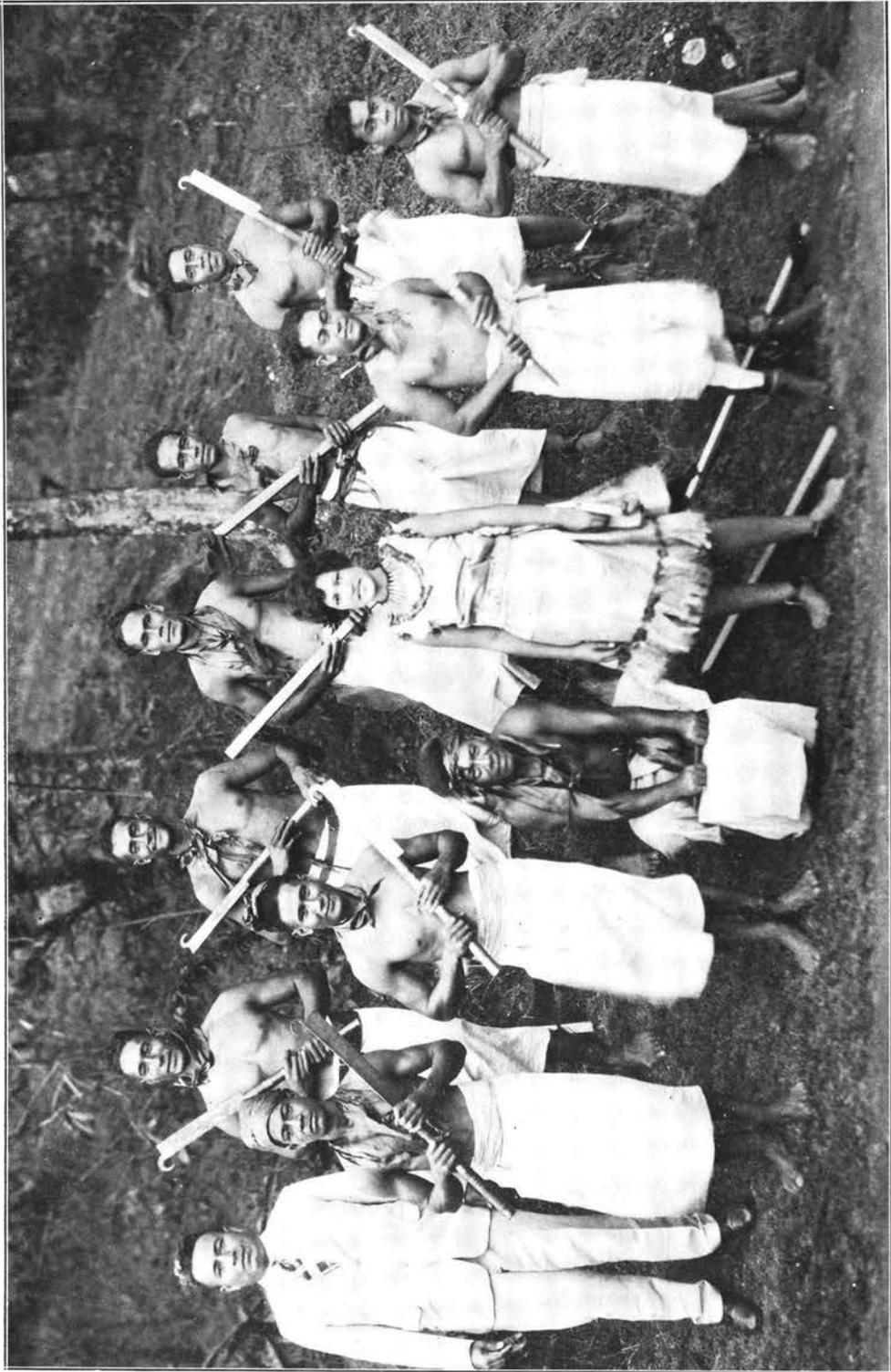
No Need for Industrialism: It would seem that there is no particular need in Samoa for industrialization of the western sort simply to make a little more money for someone who is shrewd enough to direct labor to his own personal gains. The Samoans live happily in what might be called a subsistence economy, raising the materials needed for their living, doing work required day by day, and arranging ample time for relaxation, conference, and the demands of their society.

Money, until very recently, has had no part in the Samoan life—barter has been common, the Samoans exchanging labor for food, fine mats (which are their wealth), and other fabricated articles. Their coöperative spirit was frequently illustrated in a way that caused us outsiders to comment. For example, although there is keen rivalry between the London Missionary Society churches and the Catholics and not a little bitterness between the two sects in the field of religion, nevertheless when the Catholics of Leone were making extensive repairs to their church, the officers and members of the London Missionary Society church in that village turned to and helped the Catholics without pay, it being expected, according to Samoan custom, that when the London Missionary Society church should need similar labor at a later time the Catholics would respond in kind. Such coöperation

indicates the interdependence of the various groups in Samoa and certainly makes for fraternity among them and retards the introduction of competitive, separating, and disintegrating influences.

Old Institutions: We found the institutions of Samoa that have come down from ancient times to be particularly well adapted to caring for the Samoan social needs. The government, the planning and arranging of daily community affairs—all of this is carried on in what is known as the *fono*. The *fono* is the council of elder statesmen. In these councils the chiefs are seated against the posts of the Samoan houses in order of their chiefly rank, and at these times all the old ceremonies of *kava* drinking, address, etc., are carefully observed. As a matter of fact, it is found that most of the problems there are properly and profitably referred to the *fono* of Samoan elders. The *fono* is exceedingly conservative, and tends effectively to preserve the form of government and the ancient customs. It often occurred to the writer that such an institution would be admirably adapted to any society.

As a by-product of the *fono*, though not necessarily inherent in it, the idea of rank and precedence has attained such proportions in Samoa as to outdistance even that of the Prussian army. It would seem in the true organization of the old Samoan society there was never any possibility of overlooking the relative rank of individuals—the high chief was supreme, his talking chief was of great importance and was in influence not far beneath the status of the kahuna in ancient Hawaii. The Samoan talking chief, however, differs from the kahuna in that he exerts no mystic or religious influences. Persons without chiefly titles were the burden bearers and hewers of wood and thus there was in effect a considerable caste system. In many villages the chiefly titles are so concentrated that the number of chiefs in relation to the number of laborers constitutes a burden upon the labor organization



Some three hundred natives of Samoa are now living in the Hawaiian Islands, the majority of whom live at Laie, under the direction of the Latter Day Saints Church. Their work is chiefly on the sugar plantations and on the roads. This group in native dress is ready to entertain delegates to a Pan-Pacific Union Conference.

of the village. *Kava* drinking, similarly, is surrounded with ceremony, including the order of serving the *kava* (the highest in rank receiving it first), the method in which the cup is presented, and a number of details that show the highest ceremonial finesse.

Matai System: The matai system or organization of the family has been very highly developed. The matai or family chief has control of all of the relatives, in-laws, etc., of a group and is responsible for the orderliness and conduct of this group and for the instruction of the members thereof in the lore and conventions of Samoan society. Here again it occurred to us visitors that a matai system which so insures the transmission of the knowledge and experience of the race to the children as they come on (and incidentally provides for the adoption and care of illegitimate children, who are occurring more and more frequently in Samoa) is a very wise social institution and is superior in certain respects to the American family.

Changing Ways: The second head or group of impressions which the committee had, namely, of changing ways and of new adaptations to western culture, occupied a great deal of our thinking and caused us constantly to pause and wonder as to the wisdom of these changes. Just when we were happily considering the delightful social provisions of *faa Samoa* we would see, in baldest fashion, a new western intrusion on the scene, disturbing the peace and orderliness of the old social organization. The older people are often aghast and distressed and are at a loss to understand, while the younger people are vigorously pressing the point for new, modern ideas.

Here and there we would see modern houses with galvanized iron roofs, usually of very poor architecture and marring to the unity of the scene. The old *lavalava* is still worn by the men; it is also worn by the women but it is covered by an upper garment which reaches below the

hips. These *lavalava* are now almost entirely of cloth, which is more suitable and practical than the tapa. Pants for men, in many cases, have replaced the *lavalava* and the person who wears pants feels he has a certain status above men who wear the *lavalava*. Around the Bay we saw both the barefoot and the shod, though outside the Bay region it is very uncommon for the Samoans to wear shoes. Only in the Manu'a district do women do the *siva siva* with bare breasts as of old.

Health Program: On the island of Tutuila we saw the influence of the naval health program in providing latrines and requiring their use. These unsightly but sanitary little buildings extend out in front of the villages into the bay. All the villages on Tutuila are supplied with modern water systems, though these systems are rudimentary in the extreme, consisting only of a pipe leading from a reservoir that has been formed by damming a mountain stream and running to the center of the village where one or occasionally two or three single openings of the pipe, usually furnished with a faucet—which the Samoans hardly ever take the pains to shut off—supplies the water for the village. Under this village fountain the people bathe, wash their clothes, and secure water for drinking. In the Manu'a group we found neither latrines nor water system except in the one village of Fitu'ita, which was a mile or so back from the sea. In the Manu'a district the custom obtains, which, as a matter of fact, is still very hard to divorce from practice in Tutuila and elsewhere, of using the beach for the common purposes of toilet, latrines, etc. In this district the people go down to the beach, scoop away the sand, and collect the drinking water that flows out fresh in the form of springs; having filled their pails with water they sit in the pools and bathe. These same beaches, below the high tide mark, are used for latrines; thus flies are very common in Samoa. The naval health department is doing everything possible to regulate these habits and practices and is succeeding to

a remarkable extent notwithstanding what has just been said about it. The introduction of our little red ant to destroy the larvae of the fly might be a great help. It should be noted as one of the chief features of the new adaptations that health consciousness is growing, and due to strict enforcement and to the fact that the Samoans can see that modern sanitary practices prevent and eliminate disease, the Samoans are now following fairly generally the regulations of the naval health authorities.

It would be hard to imagine a more efficient health service than that provided by the navy for the Samoan people. The population had decreased by 50% due to the white man's diseases prior to the navy's taking charge; but under navy health service it has increased over 100% and is back to the best figures that ever have obtained in this group of islands. Indeed, as Judge Frear points out in his excellent study of the health of the Samoan people, the population is increasing at the rate of 2% a year, and is soon going to constitute a serious problem in the relation of population to food supply.

One of the ancient scourges of Samoa, namely, yaws, has been practically eliminated by the naval health service. There are no cases of syphilis or gonorrhoea in Samoa, which speaks volumes for the efficiency of naval health supervision. Conjunctivitis is a serious affliction of the people and is spread by the flies, which little insects the Samoans treat with total disregard. Conjunctivitis once acquired, the Samoan is apt to resort to treatment with native herbs so that the disease becomes very serious and may cause blindness. Many cases, also, are known of the Samoan using, without regulation, a blue-stone remedy introduced by the white doctors. On the theory that if a little is good, more is better, many Samoans have lost their eyesight and have become blind through cauterizing their eyes with blue-stone.

Unmistakably modern are the automobiles that are found on the Island of Tutuila, possibly half a dozen being owned by the Samoans and twice as many owned and operated by the navy personnel. Similarly, what the Samoan people call "the gun boat" and which is, indeed, a mine sweeper, the *U.S.S. Ontario*, stands out as one of the evidences of the new against the background of the old. To see the great *Mariposa* lying out in the beautiful Pago Pago harbor with the *lava-lava*-clad, barefooted Samoans thronging the malae and eyeing this great white monster from foreign parts, is a sight to cause one to reflect. One realizes that these large, fast ships are destroying the isolation of Samoa and are bringing strangers to her shores, taking Samoans from their homes to foreign ports and returning them to the old home with new ideas, thus disintegrating *faa* Samoa and substituting therefor new customs.

When one sees on a large billboard the lurid advertisement of the modern talkie with, say, Greta Garbo starring, and sees the groups of Samoan people that throng the movie hall, he realizes that modern things are coming in apace and that the Samoans are drinking in new wines that are intoxicating in the extreme.

In place of the old heiaus and altars, every village has its modern stone church. It is in connection with these churches and with the fundamental urge which religion furnishes, particularly to a primitive people without great concern as to worldly cares, that we found the most striking example of commerce and western industry. On the Island of Aunu'u we saw a \$30,000 stone church with electric lighting equipment which had been built and paid for by the agricultural industry of that little island. The people of Aunu'u raised taro in quantity for sale around the *fagaloa* and had established connections in Hawaii for the sale of quantities of mats, thus raising \$30,000 net to pay for this splendid edifice. It is interesting to note in this connection that as soon as the religious urge which motivated this com-

mercial venture was satisfied, the people of Aunu'u ceased producing taro and mats commercially, seeing no need for their exerting themselves to make money simply for the sake of having money, or even for the sake of public improvements, such things not being regarded as necessary as religious edifices.

This religion from the West has supplanted the Samoan religion. Practically all Samoans are now members of what might be called foreign churches, 75% belonging to the London Missionary Society group and the remaining 25% being about equally split between the Catholics and Mormons. The form and the ceremony of the new religions have simply replaced the practices of the old, and on the whole with the Samoans as with the Americans, it is the form and not the spirit that obtains. Thus we get the impression that, universally religious as the Samoans appear to be, they are probably not much better Christians than the Americans at the present time.

We noted with regret that the introduction of a new government has decreased the effectiveness and control of the matai system and the *fono*, and we realized that the two must be harmonized lest the values of the old controls be lost before the new systems are thoroughly adopted and made effective.

Naval Government Efficient: The writer was very favorably impressed, on the whole, with the excellent naval government, particularly under the present set of officers. We saw these officers regarding themselves not as naval men but as civil officers and attempting to carry on the departments of civil government such as courts of law, public works, health and sanitation, education, finance, and struggling to establish effective departments of agriculture, fishing, and commerce. We realized that the naval personnel were not particularly trained for many of these things and that the short tour of service, only eighteen months, worked against the most effective type of administration.

Nevertheless, we were forced to admit that the Samoan people are very well off at the present time as far as their government and the expenses thereof are concerned.

We saw modern American educational practices in Samoa, and we regarded with alarm the centralization and the weaning away from community service that the American system is developing among these young people. The pastors' schools for young children and the London Missionary Society private schools, which are carried on in the Samoan language, are well adapted to the Samoans' needs; the other schools have had as objectives, up to the present time, the instruction of the youth along the lines of American mass education, and this the committee felt was a serious error of objective. Around the *fagaloa*, which is the site of the Naval Station and a port of call for outside boats, we saw a mass of confusion and turmoil. Away from the Bay these changes have not occurred so rapidly, but due to the attraction of the *fagaloa* and to the objectives of the present educational system, the people are leaving the distant villages and are pouring into the Bay district, as in Hawaii in days of old they left the ancient *kuleanas* and came to the centers of commerce and trade.

Time Element: Unless one is duly aware of the time element necessary in making these adjustments, he is sure to be distressed, and to regard the whole process as confusing and disappointing; but for one who recognizes the inevitability of the contacts of the western ways with old Samoa and who realizes that two or three generations will be necessary in which to make these changes, the process will seem to be, though not pleasing, effective and progressive. Furthermore, it must be said that in spite of the turmoil mentioned and the lack of understanding at the present time, the Samoan people on the whole are very happy and enjoy living more than do most other people such as, say, the Americans.

Half-Caste vs. Totolua: We found racial crosses taking place rapidly. The influence of the naval enlisted personnel, of course, comes in here, but the situation is not as bad as it might be because up to the present time there is no stigma attached to the illegitimacy of birth, and a child who is half white is regarded as rather an asset in a matai group. In order to alleviate this condition and to avoid consciousness of an undesirable quality, the word "half-caste" is being replaced by a far more desirable word, "totolua," the meaning of which is "of two bloods" and signifies the possession of the cultures of two groups. This concept is far superior to the concept employed by the word "half-caste," which signifies only half of a culture or a decided lowering of status.

Plans of the Committee: Based on the findings described above, the committee made the following plans:

The Barstow Foundation is to work through the Samoan government officials who are responsible for all phases of Samoan society. In addition to this, it is possible that the Foundation may conduct some independent experimental projects. The Foundation has adopted education as the chief field in which it will serve the Samoan people; it was felt that the navy was doing quite well with most every other branch of government and leadership but that education has the greatest possibilities of usefulness and, similarly, the greatest need for wise coöperation. The Foundation made a survey of the schools and of the health situation, presenting these studies to the government. Doubtless the government will make use of these surveys and already it has accepted the counsel of the Foundation in drawing up objectives of education suitable to the needs of the Samoan people. Furthermore, the Samoan government is proceeding immediately to revise its educational objectives and entire school system and program according to suggestions made by the Foundation. It is planned

that the Foundation will continue to coöperate and counsel with the Samoan government in educational matters in general.

The aid which the Foundation is to give is to be rendered in Samoa and to be such as to enable Samoa to profit by the services of the persons educated.

The next specific steps which the Foundation plans to take are as follows:

1. Sending three carefully selected teachers from Hawaii to assist in the teachers' institute, December to February, 1932-1933. The department of public instruction of this Territory is planning to coöperate in this matter and to furnish these teachers to the Samoan government, the Barstow Foundation paying the expenses therefor.

2. Bringing two carefully selected Samoan teachers to the Territory of Hawaii for a period of two months, during which time these people may rapidly improve their English and their knowledge of western culture and may observe the methods used in the best schools of Honolulu and rural districts.

3. Bringing two or three selected chiefs to Hawaii to learn about forage grasses and other matters of agriculture and of fishing.

4. Establishing a senior school. This fourth project is the chief concern of the Foundation and will be its main contribution to the people of American Samoa. The school is intended to train leaders; it will have eighteen students, carefully chosen by the governor, who shall secure recommendations from the local chiefs; it will be a boarding school. The Foundation will coöperate in selecting teachers and in paying the salaries of teachers; the Foundation will erect the buildings of the school and it has already drawn the objectives and program for the school. The school is to be known as the "Feleti" school in honor of the young man for whom the Foundation was created, Feleti being the Samoan translation of Freddy.

This will be a five-year experiment; if it is successful it will be continued and similar schools may be established in each of the three governmental districts. Furthermore, the need of a similar education for young women may arise and may demand the attention of the Foundation.

The fifth step consists in considering other services that may be rendered by the Foundation, such as, first: aid in sending young men to the Rockefeller medical college in Fiji for training to become medical practitioners; second, aid in the organization of kindergartens.

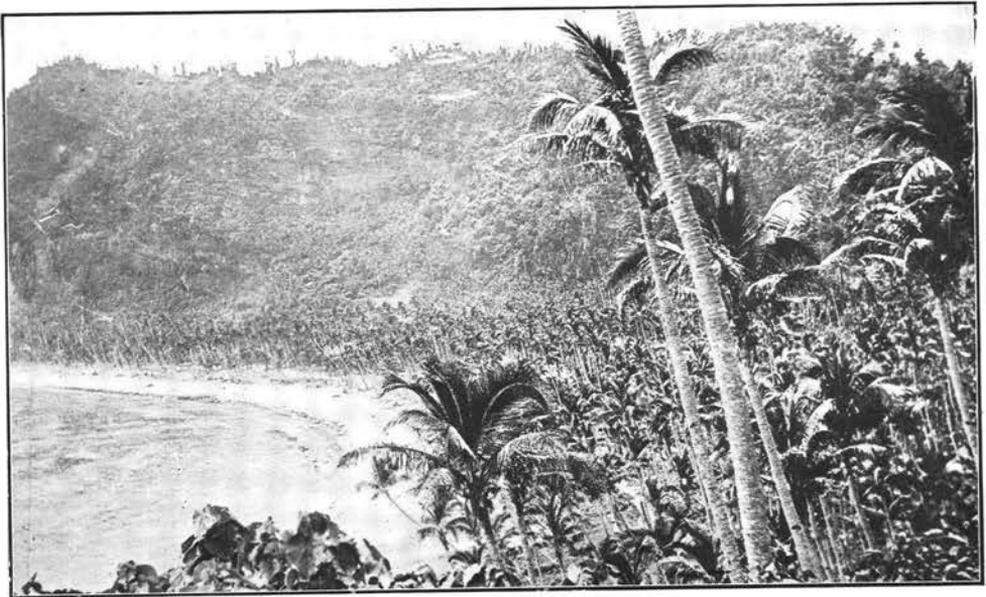
Conclusions: The committee feels that its visit was of great and necessary value; the Foundation is now ready to proceed with the several projects listed above to aid the people of Samoa. The committee realizes the need for help in preserving the good of old Samoa and for preparing

the Samoans for the inevitable adjustments to new ways. Constant study, observations, and supervision will have to reveal the further procedures and services of the Barstow Foundation.

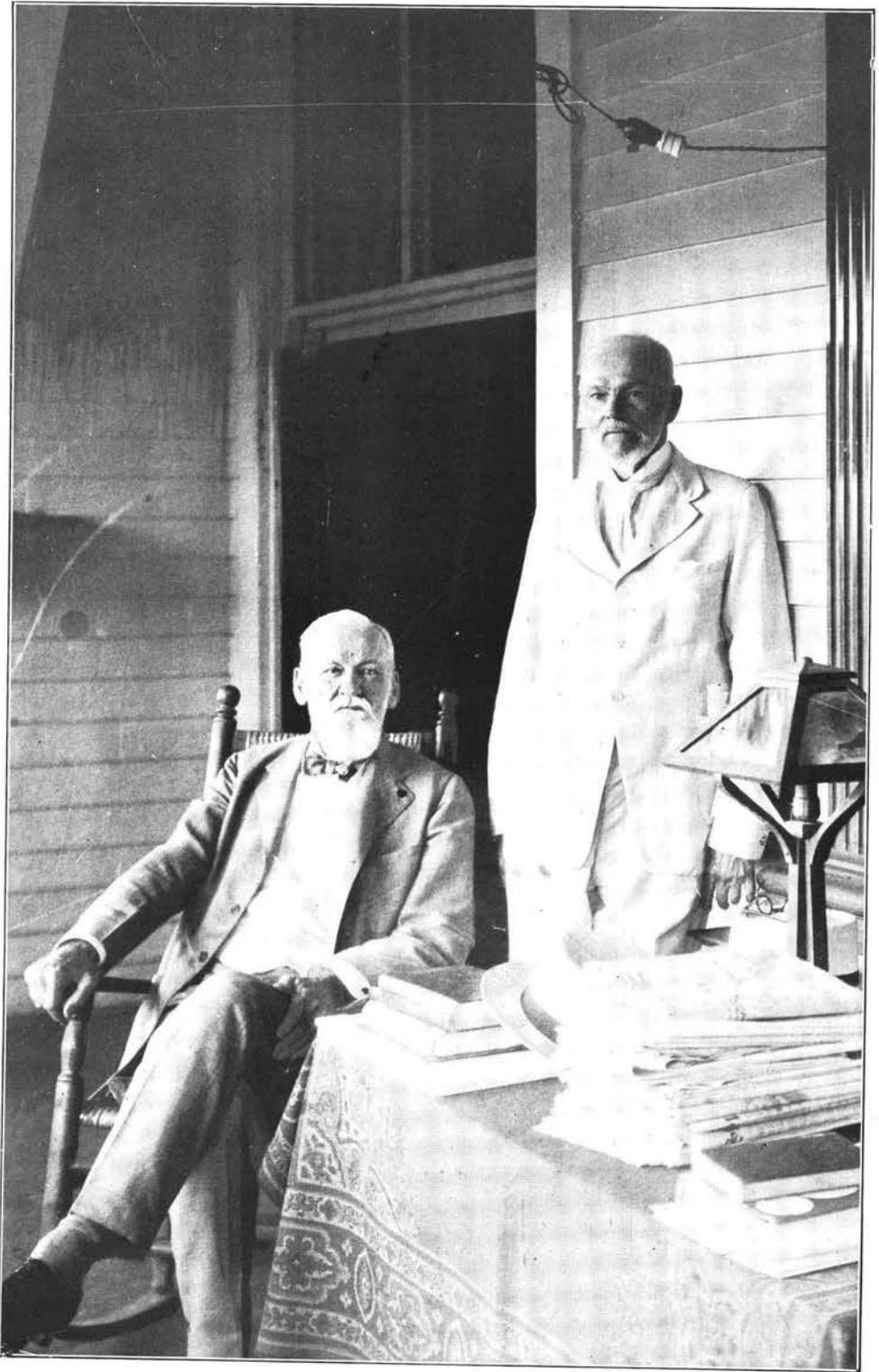
It is believed that this is a world-important experiment in education and social adjustments. Possibly there may be discovered ways for service to other groups of similar cultures in other parts of the world. It is probable that other foundations will become interested and will cooperate with the Frederic Duclos Barstow Foundation in certain phases of this work.

The members of the visiting committee and the others of the party came from Samoa with a surprisingly deep emotional reaction. All of us came to love the kindly, gentle, hospitable Samoan people.

Thus one charitable trust proceeds in its attempts to serve a primitive people.



Tropical coconut groves cover the hillsides of Samoa.



W. R. Castle and his brother, the late George P. Castle, sons of early Hawaiian missionaries, whose old homestead in Manoa Valley, Honolulu, is loaned the Pan-Pacific Union as headquarters for its Research Institution.



An early view of the Castle home which is now entirely obstructed by tall trees.

Friends of the Pan-Pacific Union

By ALEXANDER HUME FORD
Director, Pan-Pacific Union.

Word has just come to me in Peiping, August 22, of the passing of George Castle. I loved him well. He was the first man from Hawaii I ever met and we were fast friends for just a generation, a little over thirty-three years.

George and I first met on the deck of the old *S. S. China*. He and his two brothers, "Jim" and "Will," were returning from Washington; they had a host of their children with them. Harold was a small boy then, so was "Al," and Margaret and Beatrice were mere youngsters. George and I would carry these youngsters on our shoulders when they wished to play horse-fight on deck. I don't think George and I ever grew up—the youngsters always treated us as equals.

It was the acquaintance with the Castle brothers that brought me back to Hawaii

and precipitated me into the work of the Pan-Pacific Union.

"Jim," in April, 1899, was deeply interested in an experiment of Americanizing the Hawaiian Islands. He had brought over a colony and located it on Ewa plantation, but they *were* Americans. So they, one and all, hired Orientals at a low wage to do the actual work, went to Honolulu and waited for the crops to mature, took their ample profits and went back to the Mainland. I found this out seven or eight years later when I stopped off for a week at Honolulu on my way around the globe (and remained in Hawaii for twenty-three years). I wanted to see "Jim" Castle and learn the result of his experiment.

"Oh!" was his greeting, "That was a failure; I am trying Russians now." I

think he tried Spanish next. I only know that it was the habit of the Castle brothers to try anything that promised in any way to help humanity.

I was happy in Hawaii in those early days. I formed a great liking for "Will" Castle and, as for months I had my rooms at the old University Club, there was an almost daily meeting over the lunch table. In those days it was always easy to tempt L. A. Thurston or W. F. Frear to take a day off and go for a hike in the mountains. Will sat back and applauded our energy, and when George and Lorrin A. Thurston and I organized the Trail and Mountain Club it was William Castle who demanded at a lunch at the University Club that he be allowed to do his share. "All right," we answered. "You can cut a trail."

"But I am going to Europe soon," he replied.

"All right," we answered, "get it started anyway."

So he put six Japanese laborers at work on what he named the "Mt. Olympus Trail," telling them to keep on going until he told them to stop. He left for Europe and forgot all about the trail. On his return six months later he found his office had spent, I think, something near five thousand dollars and the "Olympus" trail had become the "Castle Trail," beginning at the end of the Nuuanu car line, crossing the valley and climbing the ridge to Pauoa flats and across that to Kona-huanui and on to the summit of Olympus and then down the ridge to Palolo Crater and to the trail that led to the end of the Kaimuki car line.

William Castle just whistled. "Gee," he said, "I clean forgot all about those workmen. Well, I suppose now you will want a rest house on the trail where you can camp at night," and he built it. How could one not love those Castle brothers?

William Castle for years was a trustee of the Pan-Pacific Union and the three brothers were among its first financial backers. They never failed year after year, decade after decade.

I think George and I were a little closer to each other in the later years.

I once wrote a play in my youth called "The Ideal Marriage." It was the marriage that never took place—but George's marriage was an exception, it was ideal. I think those two had but a single thought—how to make the world happier because they lived in it. I admit that sometimes Mrs. George Castle would raise her finger at me and say, "Alexander, don't you dare to invite George to lunch this week, he belongs to me for the next ten days and you leave him alone." And I always did.

How splendidly responsible with L. A. Thurston and J. P. Cooke these three Castle brothers were for the founding and carrying on of the Pan-Pacific Union may be explained in just one more anecdote. One day during the holding of the First Pan-Pacific Food Conservation Congress in 1924, I stopped George on the street and jokingly said, "Say, George, what do you mean by cutting up that magnificent property in Manoa Valley and selling it, when I wish it?"

"Ford, you want it for the Pan-Pacific Union? Wait a minute," and he rushed to the nearest telephone and rang up a number. I heard him as he called, "Oh, that you, Percy (Pond)? Say, how much of the Manoa property have you cut up into lots? What, all but seven acres and the big homestead? Well, don't cut up any more. I have given it to Ford for the Pan-Pacific Union." William grinned and said "Good," when he heard of it, and that is how we acquired a quarter of a million dollars' worth of property for the work of the Pan-Pacific Union. This gave us a prestige about the Pacific that I truly believe will some day result in the building by all the nations of the Pacific of a Pan-Pacific Palace in Honolulu, the center of the Pacific, and the great audience chamber I earnestly hope and wish will be forever named "Castle Hall."

I had begun to miss my old friends in Hawaii, for the Castles and Thurston were close to me, and their retirement

left me more alone. Walter Francis Frear I think is the last of the old guard. Dillingham, Atherton and Farrington I look upon as the leaders of the younger set. They are doing yeoman work for the cause of better understanding in the Pacific, and are the backbone in Hawaii of the great movement, but it seemed to me suddenly with the retirement of my old coworkers, and the decision that Honolulu had reached her limit in supporting conferences, that my work *in* Hawaii was finished; it is in safe hands there. Hawaii may have all the conferences she wishes now, for the mere asking, and she may reject those she feels she cannot handle, but the great teeming countries of the Orient where lives more than half the population of our globe, form an almost unknown country to our Nordics in the Pacific. Here, with the help of Honolulu as our center in the Pacific and executive headquarters, must be called many important Pan-Pacific Conferences that

will bring, on Oriental soil, the leaders of the Occident and the Orient together for better understanding and knowledge of each other.

George Castle and his brothers played an important part in the founding and maintenance of the Pan-Pacific Union. To me Hawaii seems closely associated with these old friends and supporters. The work they helped establish is being born anew in the Orient, and the example of Hawaii as a racial experimentation station of the Pacific is being followed now on a broader and a grander scale in Japan and China. It is a great work, but always Honolulu and Hawaii will remain the center of its activities.

I don't think George Castle, his gentle face and kindly manners, will be forgotten in Hawaii for another threescore years at least, for the children knew and loved him. He was always one of them and, like them, always happy.



A view of Manoa Valley from the Castle homestead.



An exhibit of farm and field products of Queensland, Australia, among which is found tobacco, the demand for which far exceeds the supply. The expected yield this year is 2,750,000 pounds from 4,500 acres.

Tobacco Leaf Culture in Queensland, Australia

By P. J. NALLY

Publicity Officer for the Queensland Forest Service

At one time or another during the past fifty years or so, pretty well all parts of Australia, more especially Queensland, have cultivated more or less large areas of tobacco leaf, but for some reason or other the efforts in this direction have been anything but sustained, with the result that the supply at any time of its capricious existence has not been equal to the demand. This fact has been, and is still, so apparent that for a number of years past over 20,000,000 pounds of raw leaf and manufactured tobacco goods have had to be imported from other countries annually, the value of which was from over £1,500,000 to £2,000,000, while the Customs and excise duty thereon, as well as on the Australian-grown leaf and manufactured goods, aggregated about £6,000,000 annually. The value of the leaf imported in 1931-32 was only slightly over £500,000. The total amount of the excise duty collected during the last-named period on all leaf and tobacco goods was nearly £3,500,000. There is no denying the fact that the average Australian is a smoker, as is exemplified by the fact that the average consumption per head of population for a period of five years is 4 pounds, the cost thereof being £1/17/7d. The estimated cost of the tobacco consumed in Australia in its different forms is nearly £12,000,000 annually. The foregoing official figures supply abundant proof of the great possibilities that await the systematic development of tobacco leaf culture in Australia. It is an indisputable fact that all kinds of first-grade tobacco leaf suitable for the manufacture of pipe to-

bacco, cigars, and cigarettes can be successfully grown in Queensland.

As the result of exhaustive investigations on the part of the Federal Select Committee some years ago, and the concomitant legislative encouragement given by the Federal Government then in power, new life has been galvanized into what has been a more or less moribund industry for many years past. The area under the crop has been considerably increased in all the States, more especially in Queensland. The cigarette leaf tobacco produced in the Mareeba, Mackay, Townsville, and Bowen districts (North Queensland) is claimed to be equal to the best imported article, and the pipe leaf tobacco is also of first-grade quality. Recent sales have demonstrated the truthfulness of these remarks, as all varieties of tobacco leaf were eagerly bought up by southern manufacturers. For the best grades of cigarette leaf prices ranging from 2/9 up to 4/— per lb. were realized.

Less than sixty years ago a very determined effort was made in Queensland to put the tobacco-growing industry on a sound basis. On the Darling Downs, in particular, several hundreds of acres were put under pipe leaf tobacco with the aid of Chinese labor. Sweating sheds for the proper treatment of the leaf were erected, and, later, several small tobacco manufacturing factories were established in Brisbane, and at several of the leading centers on the Darling Downs. For a few years the industry appeared to be on a fair way of becoming a flourishing concern, but the effort proved to be only a

flash in the pan. America, which had been suffering at the time from the aftermath of its four years of civil war, soon recovered its Australian trade, and the Queensland growers were eventually pushed out of their own market. As the result of this setback, the industry languished, and ultimately petered out altogether. Even today small clumps of wild tobacco plants are to be seen growing in different parts of South Queensland, but more especially on the Darling Downs.

About twenty years ago the Queensland Government made a further attempt to stimulate interest in the industry, and an American expert in tobacco leaf culture was specially engaged. On this occasion the boom again took place on the Darling Downs, and also in North Queensland. With the backing of a large British organization, the cultivation of pipe leaf tobacco was put on a very satisfactory footing at Texas and Inglewood, and for some years it flourished—or, at any rate, appeared to. There was a fairly large area under the crop, which was principally raised by means of irrigation. In the Proserpine and Bowen districts (North Queensland) there was also a fairly large area under cigar leaf tobacco, and in the Cardwell and Woodstock districts (North Queensland) small areas of cigar and pipe leaf tobaccos were raised. For several years there was a good market for the cigar leaf tobacco, but for some unaccountable reason there was suddenly a very marked slump in prices. This discouraged the growers so much that the majority of them discontinued the growing of the crop. The operations on the Darling Downs were also beset with difficulties; so much so, indeed, that there was a very perceptible falling off in the area under pipe leaf tobacco.

According to the latest official statistics, there were only 71 acres under tobacco leaf in 1930, and the yield therefrom was 58,594 pounds. In 1931 there were 382 acres, which produced 260,670 pounds. This year there are 4,500 acres under the crop, and it is estimated that

the yield therefrom will be 2,750,000 pounds. Prior to this the peak year in the industry so far as Queensland is concerned was in 1913, when 570,271 pounds of leaf were harvested from 731 acres, the Darling Downs producing nearly 528,000 pounds, and North Queensland slightly over 40,000 pounds. From the very inception the Darling Downs has produced considerably more than 90 per cent of the crop. Likewise Queensland has been the largest grower of tobacco leaf in the Commonwealth until quite recently. At the present time, according to reports, New South Wales and Victoria expect to harvest a much weightier crop than Queensland, but the prices realized for the leaf in the other States are much below those obtained for the Queensland-grown tobacco leaf.

With the promise of every encouragement from the Queensland Government, farmers are giving this branch of agronomy their serious attention at the present moment, and there is keen inquiry for suitable land. In this respect, there is much inquiry from the other States of the Commonwealth, particularly New South Wales and Victoria. The future prospects of the industry are very bright and cheerful at the present time, and thus another epoch in the history of the industry is being chronicled. There is no reason why Australia should not produce every ounce of tobacco that its smokers consume in such large quantities. We have the soil, climate, and general conditions suitable for the cultivation of all the best varieties of pipe, cigarette, and cigar leaf tobaccos, and all that is required to make the undertaking a complete and thorough success is the whole-hearted application of the growers to their operations and the undivided support and encouragement of all Australians, particularly those who are smokers. Several of the brands of tobaccos made from Queensland-grown leaf now on the market compare more than favorably with, if they do not excel, the other well-known

brands that have been in popular use for many years past.

Land suitable for the cultivation of tobacco leaf is available for selection on very easy terms and conditions under the perpetual lease clauses of the Land Act in the Mareeba, Dimbulah, Cooktown, and Hervey's Range (near Townsville) districts, in areas of from 100 to 200 acres. In all of these districts tobacco leaf is at the present time being successfully grown, and in some instances the leaf, when auctioned, has realized high prices. Further areas are to be made available for selection in other districts from time to time when the inquiry for such land warrants it. At the present time there are over 60,000 acres open for selection in different parts of the State. The tobacco farms are allotted only to approved applicants—that is to say, those that have £300 in cash, or can obtain a guaranteed backing for that amount.

The capital value of all the land referred to above, with the exception of that on Hervey's Range country (which is 10/—), is 2/6 per acre. The annual rental for the first fifteen years of the lease is 1½ per cent of the capital value—viz., 9/20d. per acre for a portion valued at 2/6 per acre, and 1 4/5d. per acre for

a portion valued at 10/— per acre. The annual rental for each succeeding period of fifteen years is determined by the Land Court at 1½ per cent on the unimproved capital value of the land as if it were held as a freehold at the commencement of the period in question.

The deposit required to select a tobacco farm is the first year's rent, and one-fifth of the survey fee. For example:

On a portion of 160 acres, valued at 2/6d. per acre, the deposit would be:

Rent	6	0
One-fifth survey fee.....	£1	18 0
(£9/10/0)		
Total	£2	4 0

On a portion of 160 acres, valued at 10/— per acre, the deposit would be:

Rent	£1	4 0
One-fifth survey fee.....	1	18 0
(£9/10/0)		
Total	£3	2 0

All of the selections referred to above are subject to the conditions of personal residence during the first five years of the term. The selection must be enclosed with a good and substantial fence, or other improvements effected equal to the cost of an enclosing fence, within the first five years of occupation thereon.



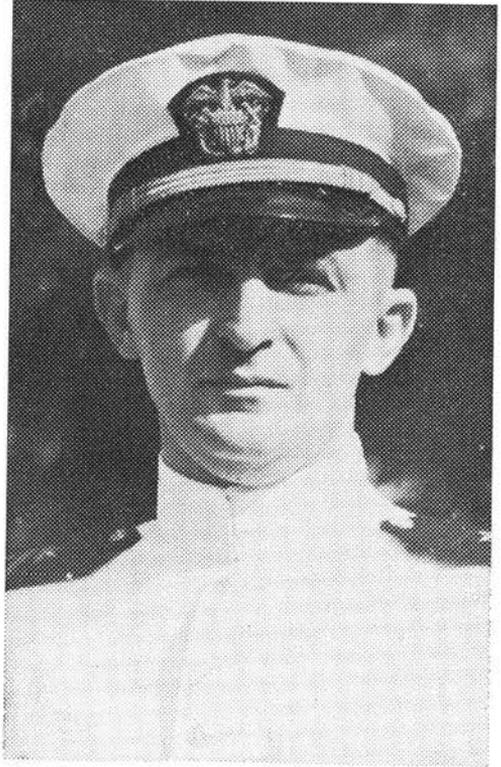
Climate of the Hawaiian Islands

By LT. T. J. RAFTERY, U.S.N.

How many realize that practically all the air over the Hawaiian islands comes from the Arctic regions, primarily from the Bering Sea area? It makes one shiver to think of it, and at the same time wonder how anyone can say such a thing. The chief reason for the delightful climate of Hawaii is that it does come from there. Briefly it can be shown why such a statement is made and why the phenomena associated with it.

First of all, the movement of the air over the surface of the earth can be traced, just like the water in a river can be followed from the source to the mouth; but air is different from water flowing in a river in this respect—it does not always follow the same path. It takes many detours and encounters many obstacles along the way. These have an appreciable effect on the characteristics of the air and cause them to change along the route; or to be more technical, the properties of the air undergo a transition depending upon the influences acting upon it.

The reason for the statement that most of the air that passes over the Hawaiian islands comes from the Arctic is this. About midway between the islands and Seattle is a more or less permanent center of high pressure, around which the air flows clockwise. The extent of this area is always changing, sometimes expanding, sometimes contracting, but practically always including Hawaii in the southwest corner, and California in the southeastern section; so, the air that flows around this center in arriving at Hawaii takes a long way around, coming from the north by way of California.



Lt. T. J. Raftery, aërological officer at Fleet Air Base, Pearl Harbor.

This brings up two more questions. First, what else is there to substantiate this statement, and second, if it is true, why aren't there the fogs for which the west coast is famous, and why does it rain sometimes, at least enough to give the beautiful green vegetation for which the Hawaiian islands are famous, when it seldom rains in Southern California?

To answer the first question two things must be known: first, a knowledge of the characteristics of the air aloft; and, second, what obstacles and influences are af-

fecting the air in its movement from its source until it reaches the islands.

To ascertain the characteristics of the air aloft two things are regularly done at the fleet air base. An airplane carrying an aërograph is sent up. This aërograph is a small, delicate instrument secured out on the wing of the plane so that its recordings are not affected by the heat from the motor, etc. A record sheet is wrapped around a drum which is turned at a given rate by a clock mechanism. As this drum turns, three pens make separate traces on the record sheet; these traces show pressure, temperature and humidity of the air and how each changes as the plane ascends through the different layers.

When the plane returns, the sheet is taken off and it shows at a glance how those characteristics of the air are varying with altitude. Also from this record many deductions are made which are very useful in weather forecasting, but these will not be discussed here.

There are two phenomena which practically always appear on the trace, and they have a most important bearing on the Hawaiian climate. The first is that there is nearly always an inversion of temperature at about 7,000 feet, and the other is that below this inversion the air is very moist, while above it the air is very dry.

Now what is an inversion and how does it affect the weather at the surface? Temperature theoretically should, and does in general decrease with altitude; an inversion occurs where the temperature increases with altitude. The inversion acts as a boundary surface between the air above and below it, so that air, moisture, or dust that might rise up from the surface will only rise as far as the bottom of the inversion, where it must stop. Anyone who has studied meteorology knows that an inversion is practically always associated with a high pressure area and having the inversion area is additional proof that the islands are within the limits of the high pressure area previously mentioned.

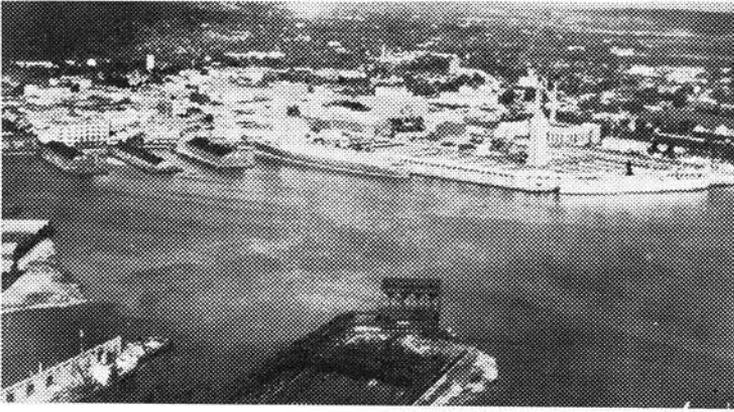
Further, having the air so dry above the inversion is very good proof that it comes from the Arctic, because cold air can contain but very little moisture and the air in starting was very cold, but it has been warmed, especially in the lower levels, as it moved south.

How did it become so moist in the levels below the inversion? Well, it has had a long passage over a broad expanse of water and each day as it moved along, it passed over warmer water which heated it from below, and as it was warmed, it rose, carrying moisture with it, but it could only rise to the inversion level; there, the moisture had to collect until the air in these levels could hold no more. Then there would come a shower, precipitating out any excess moisture that might have risen up with the warmed ascending air, but still leaving considerable moisture in the air.

Leaving this part of the discussion for a short time, let us investigate the direction of travel of the upper air over the Hawaiian islands.

At the fleet air base sounding balloons are sent up twice daily and their movement is observed with a theodolite. They are so filled with hydrogen that they rise at a predetermined rate. Knowing this and following them with the theodolite, their movement can be plotted, and from this plotting the movement of the air at any level can be computed.

From these soundings it has been learned that the predominating direction in which the air moves for many thousands of feet aloft is from between northeast and east. This in conjunction with other factors previously mentioned gives additional proof to the initial statement that the air passing over Hawaii comes from the north by way of the west coast of the mainland. A comparison of the upper air records of the naval air station, San Diego, and those at the fleet air base, Pearl Harbor, shows them to have enough in common to say that generally the same air passes over both of them, and that it passes over San Diego before it reaches Pearl Harbor.



Honolulu Harbor from the Air.

Now that the air has been traced to Hawaii what about it? First of all we should be very thankful that the islands are within the predominating high pressure area because only when it recedes, which is very seldom, can these Kona storms get in with their torrential rains. Everyone knows enough about them to know that they do not happen very often, but when they do, no one enjoys them. The other thing about the high pressure area is having the inversion with it and it acting as a damper on ascending air currents. If it were not for the inversion there would be frequent thunderstorms and everyone knows that they are a rarity here.

Also they are rare along the California coast where the inversion also persists. These prevent the air from rising up above them and thus prevent it from rising high enough for a thunderstorm to start. It is not uncommon in localities where there are thunderstorms to see thunderheads rise up to 10,000 or 15,000 feet, or even to 20,000 feet. Here it is rare to see the tops of the cumulus clouds, the kind from which thunderclouds—the forerunners of thunderstorms—develop higher than 6,000 or 7,000 feet.

Since this inversion keeps the thunderstorms away, what causes the rain? Nature has provided most useful instruments, and these are the mountain ranges. On Oahu, especially, the Koolau range

extends at about right angles to the general flow of air; the wind blows from between the east and northeast and the mountains extend northwest and southeast. The air striking these mountains is forced to rise and is carried over the top along with the air above them, then it flows on down into the valleys and over the leeward areas.

When it descends on the lee side, it is cooler than the air settled there. It forces this air to rise and at the same time cools the warmer air. This warm air is already very moist and this further cooling decreases its power to contain moisture; beyond the saturation point it must precipitate it out as rain. This is carried along by the winds aloft and the stronger the winds, the farther down from the mountains the rain extends.

There is also this fact about these mountains for which everyone should be grateful. If they were very high the moist air coming against them would lose all its moisture before it could get to the top, and the descending air would be very dry, with the result that rain would be a rarity. It is probable that the height of the mountains on Hawaii is the cause of the scarcity of rain on the Kona coast, whereas the lower mountains cause it on Oahu. So what the mountains cause on one island they prevent on the other.

Another fortunate circumstance in these islands is the lack of fogs. This can

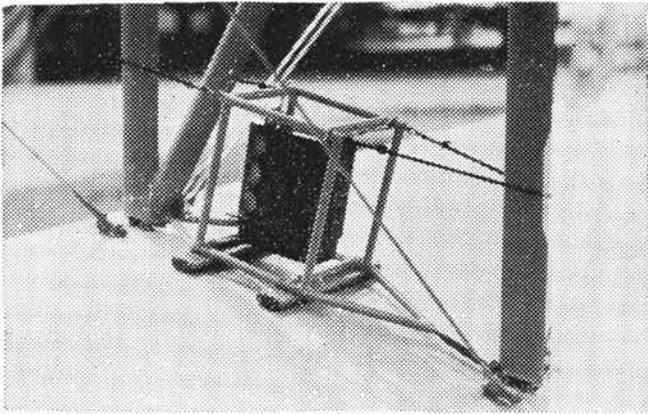
be directly attributed to the ocean. Along the coast of California the water near the shore is generally colder than out from it. The air, as it comes down the coast and moves in, is cooled by this water, this cooling causing the fog. Then, as the air moves out over the ocean towards Hawaii it passes over water, the temperature of which increases as Hawaii is approached. Therefore the air is warmed and this warming prevents fog from forming in the vicinity of these islands.

Coming now to the "Kona" weather. This is caused by a low pressure area moving up from the south and bringing with it warm and extremely moist air. The reason it reaches here is because the high pressure area has receded enough to let it move in. Since with the Kona storm come strong southerly winds aloft, the warm moist air moves in rapidly and mixes with the colder air below it. This mixing reduces the temperature of the warmer air and likewise its capacity to hold moisture, so of necessity the excess

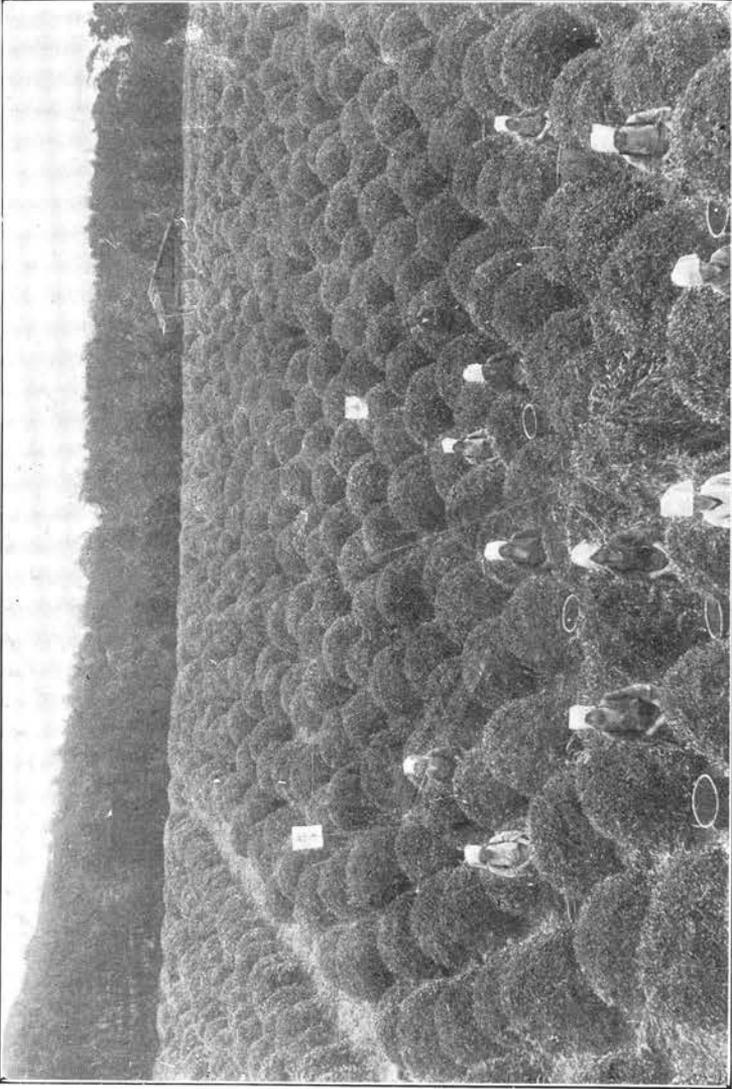
has to come out as rain, and since this air coming from the south has considerably more moisture in it than that coming from the northeast and east, much more rain will fall. That is why the Kona rains are so heavy.

Summarizing briefly, then, it can be said that there are four things which make this climate here so nearly ideal: first, the air nearly always comes from the north by a roundabout route, which improves its characteristics along the way; second, the inversion which is nearly always present, prevents heavy rains from generating; third, the low mountains cause just about enough rain to take care of our needs, and fourth, persistence of the high pressure area very seldom permits the Kona's to pass over the island.

Acknowledgment is made by the author to Cmdr. E. W. Tod, U. S. Navy, commanding the fleet air base, Pearl Harbor, for his coöperation and assistance in the preparation of this article.



Aerograph attached to the wing of a plane.



The best teas in Japan are the first crop, the season lasting from May to August. Instantaneous sterilization permanently seals all the flavor-laden juices of Japan green tea at its best.

Japanese Green Tea

By a correspondent of the *Japan Times and Mail*.

For generations green tea has been the essence of the daily life of the Japanese, sustaining them through all the vicissitudes of life—a solace in sorrow, a comfort in hardships and a moderator in joy. It forms one of the most popular themes in Japanese poetry and literature, thereby attesting to the hold it possesses over the nation, truly symbolizing the cultural life of the Japanese people. Regardless of social standing of the various strata that go to make up the big family known as the nation, it is appreciated by one and all.

The medicinal properties of Japanese green tea render it a most nourishing as well as health-giving beverage, and, from this point of view, it may be said that Japanese green tea is unsurpassed. No one who fails to appreciate the power and importance of this beverage can hope to penetrate into the uttermost recesses of the Japanese heart.

The discovery made, in recent years, by chemists of the presence of invigorating substances in the green tea of this country has added to the value of this beverage. It was Drs. Miura and Suzuki, prominent scientists of present-day Japan, who discovered that vitamin C is abundantly to be found in Japanese tea. This happy and important discovery was later confirmed by American laboratory experts, creating thereby what amounted to a world-wide sensation. Why is it that Japanese tea contains such vital properties? The reason is because it is so made as to preserve the original invigorating properties, instead of destroying or minimizing their effects in the process of preparation.

Vitamin C is known to exist in such fruits and vegetables as spinach, cabbages, lemons and oranges, but not to

the extent found in Japanese green tea. Besides, the vitamin C in these fruits and vegetables is there as long as these are in the raw state, but the moment they are cooked or heated, these valuable and vital properties are lost, or, at any rate, considerably reduced. It is a fact and a peculiar attribute of Japanese green tea that it retains this valuable vitamin C unimpaired under all imaginable conditions. The vitamin contents remain the same after a long period of storage as when the tea was fresh, and it is an amazing fact that Japanese tea retains the valuable food element of vitamin C despite the comparatively high temperature applied to it in the process of manufacture.

Another interesting fact is that almost no traces of vitamin C are found in other popular beverages, such as coffee, cocoa, black and Oolong teas. Only a meager percentage of the substance is found in Chinese green tea, the explanation for which probably may lie in the fact that this is a type of green tea which is subjected to fermentation or pan-firing during the process of manufacture. By sterilization immediately after picking, the leaves of tea grown in Japan are kept from fermentation throughout the curing process.

This absence of fermentation is also accountable for the natural green color of Japan tea. Japan green tea is in a class by itself, coming in its natural condition, uncolored and unfermented, with all the savory qualities of the leaves preserved by immediate steaming after plucking. This instantaneous sterilization permanently seals all the flavor-laden juices of Japan green tea at its best. Because of its refreshing flavor, piquancy, smoothness and pale green color of the liquor, people who know and enjoy the finer



In Japan the finest grades of tea are found at high elevations.

things of life have come to call it the "Champagne of Teas."

If you are a victim of "run-down" condition, which often brings in its train sleeplessness, "nerves," and loss of appetite; if you feel all tired out before the day is well begun; if a sallow, muddy complexion is your "good morning" from your mirror; if fleeting pains in your joints and limbs mar your happiness, make play and work alike irksome—in short, if you suffer from any of these

ailments which scientists now attribute to the lack of vitamin C, try drinking the invigorating green tea of Japan. Drink several cups of it regularly once or twice a day—at luncheon, dinner, or supper, at your midday meal or at breakfast. You will soon look and feel more joyously alive after a few weeks. Naturally, you will make it a point to drink this green tea month in and month out. This is a health-building habit which will yield results for a lifetime.

The following report on the proper method of preserving vitamin C in Japanese green tea was made by Dr. Miura in the bulletin of the Institute of Physical and Chemical Research, Vol. 8, No. 6, published in June, 1929:

"In view of the recent reports of Mattill and Pratt, as well as those of Mitchell, concerning the antiscorbutic potency of Japanese green tea first reported by us, it seems desirable to publish some of the results attained in our feeding experiments on guinea pigs, regarding the effects of the temperature of the water used for making the infusion of tea upon its vitamin activity. The technique of the members of the Lister Institute was exactly followed in our investigation of the antiscorbutic potency on guinea pigs; but, to reduce the bad effects of the tannin contained in the infusion upon animals experimented with, and to improve its taste, a few drops of autoclaved milk and some cane sugar were added to it and thoroughly mixed before giving it to the animals. It must be especially mentioned that, unlike the American investigations, which merely offered the test infusion to the animals, to be consumed at their will during 24 hours, thus risking incomplete consumption and at the same time gradual loss of vitamin activity, we forcibly fed the animals immediately after the test infusion was made.

(1) Our standard method. A certain amount of warm water with a temperature below 70 degrees Centigrade, usually between 65 and 60 degrees, is poured into a small beaker with a measured quantity of tea, when the temperature goes down quickly to about 50 degrees and the mixture is allowed to stand at room temperature for several minutes, insuring thorough soaking. The quantity of water used for this purpose varies somewhat with the amount of tea to be extracted. As a rule, neither more than one gram of tea nor more than ten cc. of warm water are used for a single beaker, to avoid a harmful continuous application of the high temperature of water. Then the tea leaves are well pressed in the beaker

and the extract decanted. Washings are repeated two or three times with a few cc. of lukewarm water by means of a pressing spatula. The washings are combined with the extract (I infusion). The II infusion, further, is made from this residue exactly as the former, but with a little larger quantity of warm water. Two-thirds of the vitamin C contained in the tea is found to be present in I, and the remaining 1/3, entirely or nearly so, in the second infusion.

(2) Stewing the tea at between 70 and 75 degrees Centigrade for 5 minutes seems to destroy about 74 per cent of its antiscorbutic activity, if we are permitted to judge tentatively from our limited number of experiments.

(3) When 20 to 30 cc. of boiling water are added to one gram of the tea placed in a small beaker, which is then left standing in a hot chamber at 70 to 80 degrees Centigrade, the temperature of the water soon drops abruptly to about 90 degrees and then slowly to about 85 degrees Centigrade at the end of exactly one minute. The antiscorbutic activity of the infusion, thus obtained, varies greatly in accordance with the difference in its subsequent treatment before feeding. When the infusion is decanted and cooled down with no loss of time, its activity is shown to be 33 per cent of that originally present in the tea; but, if the infusion is left at room temperature, the more the loss of its activity is complete, the more is the time required for its cooling down to 60 degrees or a little below.

(4) The activity of the tea infusion, prepared by our standard method, is not lost materially for the next two hours' standing at room temperature.

(5) The above results explain easily the low antiscorbutic value of Japan green tea, reported by Murlin, Mattill and Pratt, and also the inactivity found by Mitchell in tea infusion, prepared in our own way.

(6) The importance of the method, especially in the application of the proper temperature of water in making the potent tea infusion, is indicated.

Soya Beans in the Philippines

By MARIA Y. OROSA

Chief, Division of Food Preservation, Bureau of Science, Manila

The soy bean is also known as soya bean or soja bean. In botany it was referred to as *Glycine hispida*, but now the botanical name of the plant has become *Glucine max.* under the international rules of botanical nomenclature. It has been known in China and Japan for several thousand years. Adolph and Kiang state that the use of the soy bean in China dates back to the beginning of China's agricultural age under the emperor Shen Nung, and that it is mentioned in the Ben Tsao Yang Mu, written by Shen Nung in the year 2838 B. C.

The soy bean is a native of eastern Asia. When and by whom the soy bean was first introduced into the Philippines, no one can ascertain. The Filipino people have long known some important soy-bean preparations, such as soy sauce, or "toyo," bean curd, or "tokua," fermented bean curd, or "tahuri," not knowing that they were prepared from this bean. The seed is known in some parts of the Philippines, where it is grown, as "utao."

Since 1880 the soy bean has been a farm crop in the United States, but during the early years of its introduction it was utilized only as a forage crop. Later the value and uses of the oil became known both in America and Europe. Due to the scarcity of cottonseed and linseed oil, coupled with proof that the soy bean is easy to grow, easy to harvest, easy to handle, and is not as easily attacked by insects as other seeds, America and Europe began to devote more attention to the growing of the soy bean for its oil. The meal is used as animal food and as fertilizer. The oil is now used in the manufacture of soap, paint, candles, artificial rubber-proofing, liquid enamels and

waterproof goods, such as cloth, umbrellas and lanterns, lacquer for varnish and printing ink, and in the manufacture of certain foodstuffs, as salad oil and butter substitutes. Baked soy beans (pork and bean style) soy-bean flour and soy-bean meal are now being put on the market by American and European industries.

The soy bean for several thousands of years has been utilized by the Chinese and Japanese as food. Some of the soy-bean preparations are consumed in these countries three times a day. The Chinese people do not use dairy products and most of them consume only a small amount of meat. Despite these facts, the Chinese people have lived for centuries on what appears to be a well-balanced diet through the use of the soy bean.

The main object of this article is to encourage the Filipino people to use more soy beans, and preparations made from them, as food. It is an accepted belief that Filipinos do not eat a well-balanced diet. One reason for this is the limited earning capacity of many of us, which prohibits the purchase of foods that have the necessary proteins and fats, such as meat, eggs, milk, etc. Rice, which is mostly starch, and on which many of us depend for our living, cannot supply our bodies with the proteins and fats necessary for health. Meat or some other source of protein must be obtained by the body for the building of tissues, and the rebuilding of the wear and tear of fatigue. To those people who cannot well afford to eat expensive protein and fat products, on account of their limited income, we strongly suggest the liberal use of soy beans in their diet. Experiments by different food experts indicate that 20 per

cent soy beans and 80 per cent rice make a well-balanced diet as far as protein and fat are concerned.

There is a wide belief, however, that a diet should not consist entirely of concentrated food, as would be the case with a rice-soy-bean diet, but that it should be supplemented by bulky materials, such as vegetables. At any rate, it would seem advisable to use leafy vegetables as a source of vitamins and necessary mineral salts.

In considering the food value of the soy bean, Daniels and Nichols, and Osbourne and Mendel found that it averages a high percentage of physiologically useful protein, a considerable amount of energy-yielding fat and carbohydrate, and sufficient fat-soluble vitamin A and water-soluble vitamin B. In addition to the fact that the soy bean is rich in protein, this protein, unlike that of all other vegetables, is similar to animal protein or to protein of the human body. The different kinds of protein contain a number of different amino acids. Generally, plant proteins seem to lack some of the active amino acids, and the soy bean is an exception. McCollum says, "Its proteins, which are adequate when fed at a plane corresponding to 17 per cent or more of the diet, can support growth when they form the sole protein supply." Horvath says, "The soy-bean protein is a complete protein containing all essential amino acids necessary for the building up of the protein of the human organs."

Science has found that besides carbohydrates, fats, proteins, and minerals, the body needs substances called vitamins. Bureau of Science tests have shown that polished rice, which most of us eat, is deficient in vitamin B. McCollum found

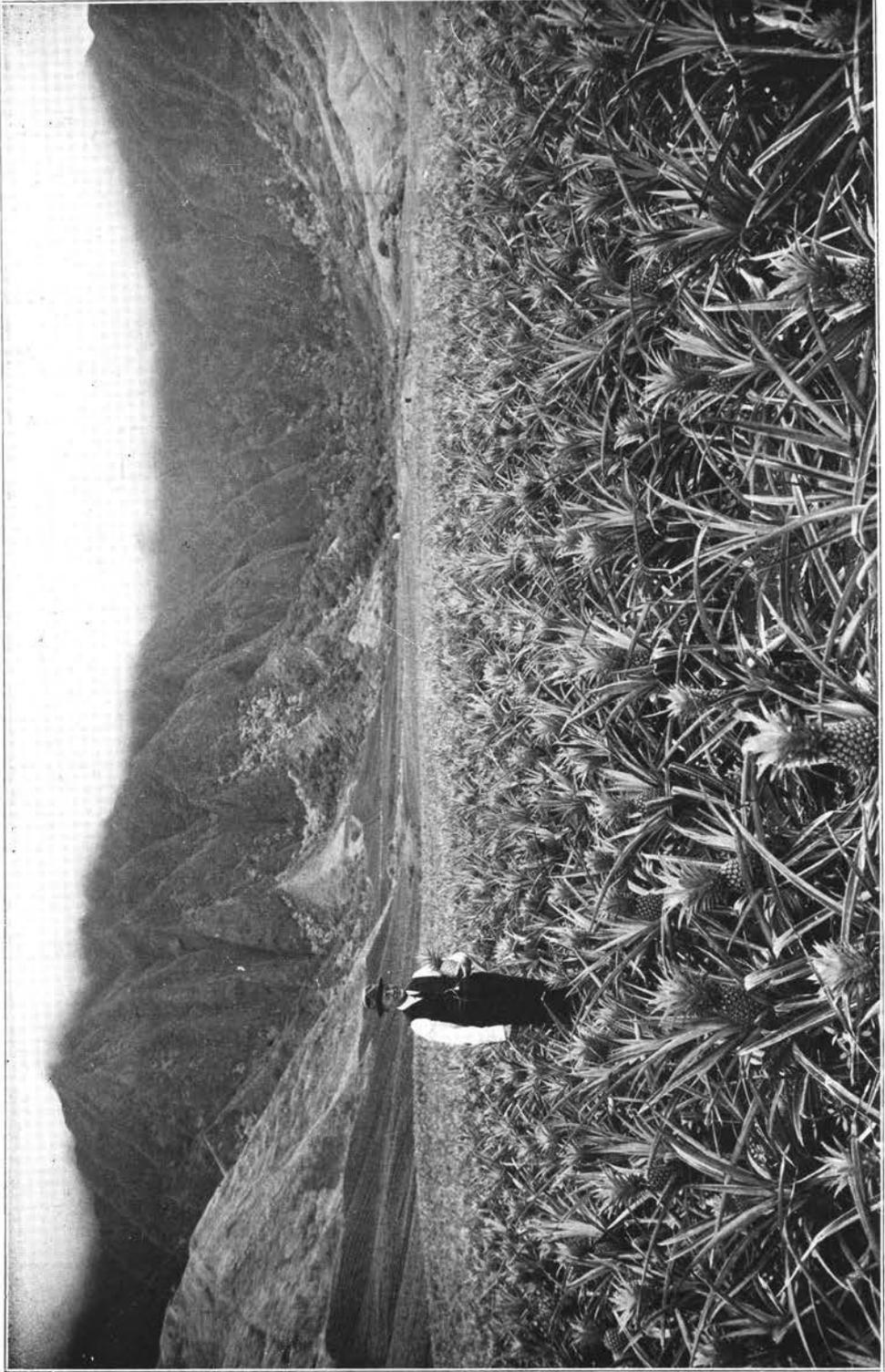
it deficient in vitamin A. Horvath found the soy bean to contain vitamins A and B, also two called F and G. Other investigators found vitamins A, D, E, and C.

While the addition of soy beans to rice would add vitamins to the diet and considerably improve its quality, particularly in reference to the deficiency of vitamins A and B, it would probably be better not to depend entirely on soy beans and rice for vitamins, but to add fruits and vegetables, particularly leafy vegetables. However, the addition of soy beans would probably improve the vitamin content of the diet of most of the poorer classes and make it possible for them to secure such additional vitamins at a nominal cost.

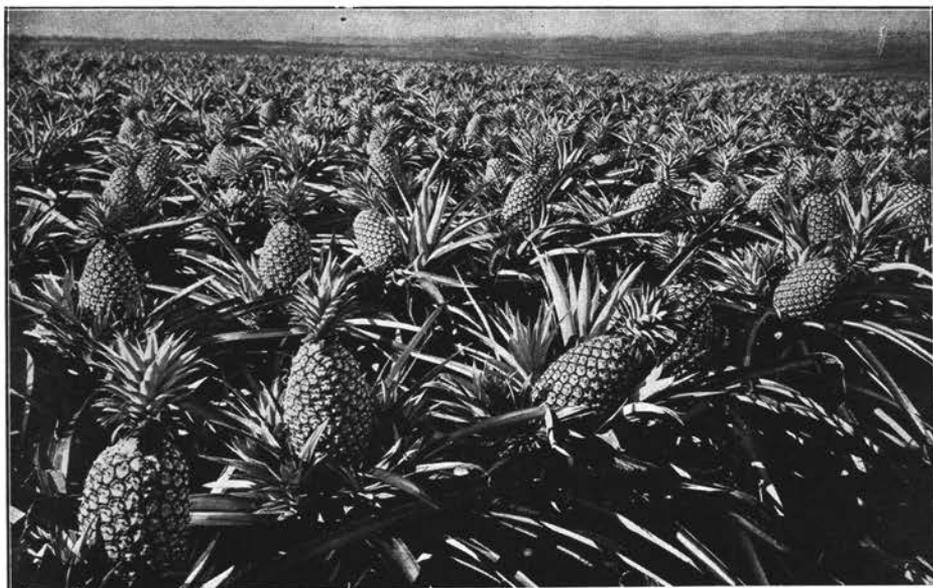
Soy-bean flour is now being prepared by several factories in Europe and America, and is especially valuable for diabetic patients, as it contains only a very small percentage of starch.

Soy-bean milk is used in China much as cow's milk is used in the United States. Preparations requiring milk can be successfully made by using soy-bean milk instead of canned milk or fresh cow's or carabao's milk. In the Philippines, where there is a scarcity of fresh milk, and where the milk, both fresh and canned, is high in price, the use of soy-bean milk will be very beneficial.

In considering a suitable diet for the poorer classes, the question of price must always be one of paramount importance. The beans which we have used in our experiments were bought in the open market at less than the current price of rice. If they were grown or imported in larger quantities they would probably be cheaper than they are at present, and substituting part of the rice in the diet by soy beans would not increase the price of the diet.



Hawaiian pineapples near Schofield Barracks where the largest fields on the island of Oahu are located. From six months to a year before the actual process of planting, the soil is prepared with many plowings. Thirty thousand tons of fertilizer were used in 1930, valued at \$1,500,000.



A field of ripe pineapples ready to harvest.

Hawaiian Pineapples

By LORIN TARR GILL

(Published through the courtesy of the Association of Hawaiian Pineapple Cannerys.
Cuts by courtesy of the Honolulu Chamber of Commerce.)

Two thousand miles out in mid-Pacific, straight in the path of the setting sun, are the coral-fringed islands where the pineapples grow. There acres and acres of the gray-green plants march in orderly rows across plains and hillocks, up mountain sides to the edges of palis and gulches and down to the sparkling blue of the tropical sea. There miles and miles of spear-pointed leaves set with thousands of the "King of Fruits" form a remarkable tapestry on the face of a land known throughout the world as the pineapple's paradise.

It is indeed true that pineapples, radiating the sunshine of those tropic isles, have a flavor and quality all their own.

Yet, if it were not for the millions of gleaming cans, each carrying its message from Hawaii-*nei*, those who live in colder climates would not know what Hawaiian pineapple is like. They would never taste the uncloying flavor of the sun-ripened fruit, preserved at its moment of perfection and utterly unlike pineapple picked too green to ripen properly, or picked ripe and spoiled before it reaches its destination. Whether they contain the golden slices, delicious segments, the vitalizing juice or the pineapple in its crushed form, they hold as appetizing fruit as one can get out of a can.

Within them, too, lies the solution of a problem met in its entirety by all Hawaii,

a land endowed with perfect climatic conditions for the growing of pineapples, but distinctly "at sea" in that it is unable to place the fruit before its customers in the mainland United States in time for them to enjoy the rich flavor brought to full maturity in the field. For, after the pineapple reaches perfect ripeness, but few days may pass before its quality begins to deteriorate; and boats require from four days to two weeks to reach even the Pacific Coast.

The history of the Hawaiian pineapple production is a story of achievement that has taken a place in the annals of the great agricultural industries; it is safe to say that no other crop in America has, through public demand, been built from nothing to a value of over thirty million dollars in thirty years. It is not a story of immediate success nor one in which luck played a determining part; it is a chronicle of many years of intensive work in which every process from the planting of the slips in the field to the placing of the canned product in the hands of the consumer has been studied with the greatest care; and in which American ingenuity and enterprise have been exemplified.

The promoters of canned pineapple faced many years of struggle and doubt; the pioneers of the industry were thought to be, if not actually subject to illusions, at least riding a hobby when they talked of making a commercial success of shipping and selling in tremendous quantities what was then only a table luxury enjoyed by a privileged few.

Beginnings of Pineapple Culture—No one knows when the pineapple (*Ananas sativus*) was first tasted by a member of the human family, but it may have been that, centuries ago, some desperate wanderer cut one of them and found that the juice would quench his thirst. The fruit was given its name because its external shell resembles a pine cone and the term "apple" is a very old word denominated fruit; it has been eaten and rel-

ished in tropical countries for a great many years and has been a delicacy on the dining tables of the civilized world since the days of the early voyagers to America.

For many years the pineapple was grown in European greenhouses as a luxury for the nobility and the very wealthy, but later, with the advent of rapid steam navigation, the European market was supplied from the West Indies. Even in those days, however, it was evident that the pineapple was not well adapted for a fresh-fruit trade.

Strange to say, the fruit appears to have been known in Polynesia in prehistoric times. According to evidence offered by Dr. Forest B. H. Brown, botanist of the Bernice P. Bishop Museum of Honolulu, six forms of the plant, originated by the Marquesans from a single species endemic to Brazil, suggest that the early Polynesians, through contact with America, obtained their first stock long before the discovery of the archipelago by Europeans.

There is an old Hawaiian legend of Kealiokaloa, son of Umi, who reigned about 1525 A.D., when, it is said, a Spanish vessel on its way from Central America to the Orient was wrecked on the south coast of Kona on the island of Hawaii, and the only survivors were the captain and his sister. The wreckage may have brought the pineapple ashore. Others believe that the fruit was brought to Hawaii by traders or whalers who, in the early part of the last century, made it a practice to visit the Kona coast.

It is known, however, that the pineapple had been growing wild on Hawaii before the first plantings were made by Don Francisco de Paula y Marin, called by the natives "Manini," in Honolulu on January 11, 1813; and that the Hawaiians had named it "halakahiki," a compound of the "hala," the fruit of the pandanus, which the pineapple resembles, and of "kahiki," a foreign land.

Sometime prior to the 80's this half-wild pineapple, picked in the Kona district, was being shipped by sailing vessel to San Francisco. The trade, while of considerable importance, as judged by the rather small over-sea commerce of the islands at that time, was uncertain; transportation was difficult; and the fruit, at the best a dainty traveler, spoiled quickly.

Not until 1885 was any real attention paid to pineapples in Hawaii.

The Beginnings of the Hawaiian Industry—Captain John Kidwell, a nurseryman, later to be known as the "Father of the Pineapple Industry in Hawaii," came to Honolulu in 1882, and, seeing where the shipping problem could be simplified by growing the fruit there instead of on the more remote Kona coast, and sending it to San Francisco direct, established the first Hawaiian pineapple plantation in Manoa Valley. Later, dissatisfied with the quality of the Kona fruit, which, even under cultivation, was undersized, fibrous and deficient in sugar, he secured planting material of many varieties for trial. From these he selected the Smooth Cayenne, which, as it was superior in flavor and texture, attracted attention from the outset, and soon justified its choice for commercial use.

The aristocrat of fruits has stood the test of time; it has become the one variety which has filled the hundreds of millions of cans sent from Hawaii to the four corners of the earth; indeed, the success of the entire industry is founded on the selection of the Smooth Cayenne, and Captain Kidwell's decision that, in order to be properly appreciated throughout the world, Hawaiian pineapple must be canned.

And for canning purposes the Smooth Cayenne is excellent. Its cylindrical form, flat eyes, uniform texture and freedom from large internal cavities insure easy handling, a minimum of waste and a uniform product. Moreover, the leaves have few of the sharp spines which render

many other varieties difficult to cultivate and harvest.

The first canning venture was instituted by Captain Kidwell in 1892, and, during the next seven years, about 14,000 cases were produced.

However, the real birthplace of Hawaii's great pineapple industry was at Wahiawa, Oahu, where at an elevation of from 700 to 1,000 feet the fruit attains its full perfection to this day.

It is interesting to recall the arrival there, early in 1901, of some 80 agriculturists from southern California who, under the leadership of Byron O. Clark, immediately engaged in small farming. "Children in the Dark" they were called; but they soon found that, while the pineapple thrived in those areas, with dependence on the shipping of the fresh fruit its cultivation was an uncertain proposition.

It was Clark who first demonstrated that pineapples would grow well at Wahiawa, who was the first to cultivate his 40 acres with team and riding cultivator, and who put the industry in a position to pay for the first time in 20 years. His short-lived Tropic Fruit Company was organized in 1902, and, with his "pack" put up in glass, he originated direct delivery service between Honolulu and the mainland. Clark believed in the pineapple as a future industry of Hawaii, but even he, it is said, did not visualize its latent possibilities.

By 1906 there were three canneries at Wahiawa, supplied by a host of small growers, and that section had become the "hub of the largest pineapple industry in the world." In that year the Hawaiian Pineapple Company moved its cannery to Honolulu.

The entrance of the American Can Company into the Hawaiian field in 1906 solved a major problem of those early days. Before its advent the packers had, in part, manufactured their own cans and had imported them from as far east as

Chicago. As they were of a bulky nature and were billed on a measurement basis, transportation charges were heavy and at its best the can supply was unsatisfactory.

The Industry Expands—With the growth of the industry, many problems were solved: machinery was invented and perfected, better agricultural methods were worked out, other canneries were established, and in 1907 an advertising campaign, the first, it is believed, ever carried on at the expense of an entire industry, and calculated to increase the sale, not of a brand, but of a product, was announced to meet a depression in business conditions. This, with the aid of specialty salesmen and a lower price, quadrupled the consumption of Hawaiian pineapple in about a year and a half and the turning point of the new enterprise was passed.

Today pineapple growing and canning is the second largest industry in the islands. It supplies the world with different grades and forms of Hawaiian pineapple marketed under the labels of innumerable grocery firms. All the products adhere to a standard of quality determined by the Association of Hawaiian Pineapple Canners. Hawaiian canned pineapple comes in several forms—sliced, tidbits and crushed; the established grades for sliced goods are known as fancy quality, standard quality, and broken slices; grades of tidbits and crushed fruit are distinguished by the sugar content of the syrup.

Strength in Unity—The phenomenal growth and success of the industry have been made possible by the organized efforts of the individual growers who early combined to protect, promote and market their products and to conduct experiments for the furthering of their interests.

The Hawaiian Pineapple Growers' Association, the first organization of men and firms engaged in pineapple growing and packing in Hawaii, was formed in 1908.

In 1912, the original association having become obsolete, the Hawaiian Pineapple Packers' Association was formed; and in 1922 the name was changed to the Association of Hawaiian Pineapple Canners.

Soon after the affiliation of the packers, the need for specialized scientific research became apparent. In 1914 the Hawaiian Pineapple Packers' Association formed an alliance with the Hawaiian Sugar Planters' Association and supported a scientific staff at the experiment station of the latter, who, with the aid of chemists from the local fertilizer companies, "worked at the happy combination of the practical and scientific" for the benefit of the industry.

The decision having been made to go more extensively into experimental work with pineapples, agricultural and plant-breeding work was started early in 1923 on 60 acres of land acquired by the station at Wahiawa. An additional 40 acres was added in 1925.

In September, 1924, the headquarters of the A. H. P. C. experiment station were moved to the grounds of the University of Hawaii, where, in cooperation with that institution, it began a period of expansion. It now occupies a group of buildings, part of which are on the university grounds, but the newer ones are on adjacent land purchased by the association in 1930.

"Where science can teach us we seek its guidance" might well be the motto of the experiment station, organized in order to undertake and encourage scientific development of pineapple culture.

Under the leadership of its director, Dr. Royal N. Chapman, the station employs a corps of trained specialists in chemistry, entomology, genetics, nematology, physiology, agriculture and pathology. Within a few years it has contributed substantially to our knowledge of the pineapple plant and its culture, of pineapple soils and of the parasites which prey upon this crop. At its substation at Wahiawa the department of agronomy

conducts field experiments with an eye to determining the applicability of laboratory findings. An extensive program of plant breeding is being conducted in the search for a substitute for the Smooth Cayenne.

Why is it necessary to find another variety to replace the one that has meant "Hawaiian Pineapple" for so many years? "The industry is 'playing safe'." the scientists say. "It is in an unfortunate position in that it has but one type that will yield a high-quality canned product and is adaptable to conditions in Hawaii. What if the Smooth Cayenne should fail, as other varieties of plants have done? It is our duty to provide another pineapple that is just as good."

To that end are annually propagated tens of thousands of seedlings grown from seed obtained by hand-pollinating pineapple flowers, each guarded and cultivated carefully, each with its potential chance of supplementing the Smooth Cayenne. And if that most perfect of pineapples is ever superseded in the Islands, the world will know Hawaiian pineapple that will surpass any man and nature have yet produced.

Hawaii has indeed proved itself to be the pineapple's paradise. Strange to say, nature has not seen fit to let pineapples of the Hawaiian standard be grown anywhere else; but, through soil and climate, the islands have coöperated with man to prove just how good a pineapple can be.

The pineapple plant is grown successfully at altitudes varying from nearly sea level to 3,500 feet, and in regions of rainfall of from 15 to over 150 inches a year. The majority of the fruit comes from regions between the altitudes of 500 and 1,500 feet, with average annual temperatures between 70 and 75 degrees.

"Pineapple culture has been going through an interesting evolution," Dr. A. L. Dean, former director of the experiment station, has explained. "It is only a few years ago when we thought that we must have virgin land to grow 'pines.' There was a good deal of moving

about onto new lands, and taking of lands on short-time leases. With the stabilizing of the industry and the realization that we had but a limited area which was well suited for pineapples, there began the evolution of what may be called permanent pineapple agriculture. We are coming gradually to think in terms of average production per acre over a period of years, cropping seasons and resting seasons, rather than merely tons of fruit per crop."

Pineapples and Sugar—Most of the Hawaiian lands now in pineapple were ranch or waste lands. Few that were in sugar cane are now in "pines." As the division of land between sugar cane and pineapple plantations is largely determined by water supply, coastal areas which can be irrigated are occupied by sugar cane, while the uplands and foothills which cannot readily be irrigated and have insufficient rainfall for cane are given over to pineapples. The last-named crop requires but little water; the few districts with abundant rainfall where it is grown are, for some reason, such as distance from a mill, not desirable for cane.

No pineapples are now grown commercially under irrigation. Early attempts to foster better crops by means of an artificial water supply were unsuccessful. Recent investigations have shown that the pineapple is a highly efficient user of water, requiring but 25 pounds to build up a pound of dry matter, a contrast to the requirements of the garden variety of cactus, which takes 40 to 50 pounds, sugar cane, which takes about 500, and lettuce, which needs 1,000.

Pineapple Agriculture Is Unique—The culture of the pineapple is an unusually interesting agricultural development. "Here we have a plant," Dr. Dean explains, "a close relative of the Spanish moss which adorns the trees in Florida and elsewhere, which in its native state grew in the half shade of the open forest, falling over and rooting and thus spread-



Most pineapples are planted through mulching paper, which conserves moisture and prevents the excessive growth of weeds.

ing over the ground. I fancy that its roots were mostly in the surface layers of leaf mold. At any rate it is equipped with aerial roots and can maintain itself for long periods with scant contact with the soil, provided it has moisture and some shade. We have taken this plant and are growing it in pure stands, 15,000 to 20,000 plants to the acre, for hundreds of acres together."

Pineapples are unusual also in that they are propagated by setting out vegetative portions of the plant—crowns from the tops of the fruits, slips borne on the fruit stem or shoots arising lower down on the main stalk. These parts are so resistant to drying that they may be kept in the air for months without losing their power to grow. As a matter of fact the accepted practice is to "cure" planting material for a week or more by inverting it and exposing it to the sun. And as good plants can come only from good planting material, every inferior crown, slip or sucker is cast out; each plant is examined and if retained, is hand-trimmed and sun-cured before it is planted.

At Wahiawa, Oahu, where a lofty, jagged mountain range rises on either side of an expanse of rolling country, the tourist may stand in the center of that island's great pineapple plantations. There, too, one learns that good fruit must have its beginning in the fields.

In pineapple culture good soil preparation cannot be overstressed. From six months to a year before the actual process of planting, heavy disc gang plows, pulled by caterpillar tractors, break the ground, turn the earth to a depth of 12 inches, and plow under the cover crops which have been grown for a year or more between cycles of pineapples in order that they may rejuvenate the soil and contribute to the organic matter of the field. This first plowing is followed by other plowings and discings extending through many months, resulting in one of the most thorough preparations known to agriculture.

Where the contours allow, roads are laid out 300 feet apart; then the beds are marked off to that length and fertilizer applied. Where paper is to be used as

mulch, machines lay long strips of asphalt-coated mulching paper over the fertilized beds—paper ranging in width from 36 to 54 inches, which comes in 300-foot rolls. Approximately 24 rolls of the narrower width, less of the wider, are used per acre.

The mulching process, invented by Charles Franklin Eckhart, an agricultural expert of Hawaii, prevents the excessive growth of weeds, conserves moisture when it is scarce, sheds water when rainfall is heavy, and so preventing water-logging around the plants and washing of fertilizer too deeply into the soil, and increases the temperature of the surface soil during the early stages of growth, thereby hastening development. Not all fields are mulched.

Planting the Pineapple—As no mechanical means has yet been devised for the planting of pineapple a hand planting gang follows. A wire carrying markers showing the spacing is stretched the full length of the prepared bed and the planter, guided by the wire, thrusts a steel blade through the paper, if present, eight inches into the ground at the desired spot; then with a twist of the wrist, he makes a place for the "seed piece" which he thrusts in alongside the blade with his other hand. From 10,000 to 20,000 plants per acre are commonly set in this way. The typical planting is about 15,000 plants set in varying styles, including two, three and four lines to the bed.

In a few weeks, if there is adequate moisture, the plants start to grow.

Modern Fertilizing Methods—The use of fertilizers to improve the yield and quality of the fruit has attained large proportions in Hawaii. Thirty thousand tons, mainly in the mixed forms, and valued at \$1,500,000, were used in 1930.

Usually 0.1 pound per plant of a complete fertilizer is applied under the paper at planting time and an equal quantity, if not more, is applied later, either in the

ground or in the axils of the basal leaves. Owing to the fact that the soil roots of the pineapple are hosts to numerous devastating insects, nematodes and fungi, the latter system has proved very efficient, for the fertilizers are partly absorbed by axillary roots and partly by soil roots and the plant thrives under the treatment. This "base-leaf feeding," the careful tossing of a handful of fertilizer into the axils of the base leaves of the plant with due care to avoid burning by getting any of the chemicals into the tender hearts of the plants, is done by hand.

It requires from 2,000 to 4,000 pounds of fertilizer per acre to produce one crop of fruit—a program that, at first, appears to be excessive; but when one considers that the first crop should yield 25 tons of fruit to the acre and has been known to mount close to 40, there remains little doubt as to its economy.

"This," as Dr. Dean has said, "is certainly doing tricks with nature and she sometimes reminds us that she does not care for tricks." Yet some of the field men feel that they have been cheated when a field fails to yield 20 tons to the acre in a single crop.

The pineapple plant is no exception to the fact that plants vary in their capacity to absorb different nutrients. The failure of the fruit to grow on many of the manganese-rich soils of the islands was a great handicap to the industry in earlier years; iron starvation induced by certain factors which make iron unassimilable, despite the high percentage of iron in the soil, caused the trouble and steps were taken to combat it.

As a result of tests made by Mr. Maxwell Johnson, former chemist at the Hawaii Agricultural Experiment Station, a simple and inexpensive method of providing iron has been adopted as standard practice on most lands. Scrap iron is treated with sulphuric acid and the resulting iron sulphate, dissolved in water, is sprayed as a dilute solution over the growing plants, furnishing all the iron they need for normal healthy growth.

Pineapples have thus been grown successfully on lands formerly unsuited to them and the industry has been permitted to expand far beyond its former limits.

One would think that, with the ridding of the fields of weeds by means of horse-drawn cultivators and hand-hoeing, the pineapple crop could be left to its own devices until time for harvesting. On the contrary, a number of disorders may interfere.

Plants, apparently normal in every respect when placed in the ground, refuse to grow and are found to have collapsed from butt-rot or heart-rot. Usually few in number, these are replaced by fresh "seed."

Then, often, after the young plants show a vigorous growth, a tiny insect called thrips flies in from adjoining waste lands, punctures the tender tissue of the inner leaves, feeds and deposits a virus deadly to pineapples. It is not until a number of days later that the plant shows visible signs of the infection in the form of yellow spots on its leaves and, a little later, the whole plant tips to one side with rot through its vitals. More replanting follows.

There are many more months of growth; then, often, plants near the fruiting stage are found to be discolored and withered, symptoms of the dreaded "wilt." The loss is even more serious, for it is then too late for replanting.

Science again rallies to defence. As investigation has shown that the trouble may be laid at the feet of the lowly mealybug, assisted by the ant, high pressure spraying equipment using oil emulsions is employed to destroy these pests. An unceasing watch is kept to detect mealybug invasion across the dust-mulched strips, roads, and special beds of pineapples arranged parallel to the edges of the fields.

The Blossom Appears—The planting, we will presume, has been done in the early fall and the first crop will be obtained the second summer following, a

period of from 18 to 22 months of growth. In from a year to 15 months the first sign of the future pineapple is seen in the form of a blossom in the heart of the plant. The flower spike is short and thick and does not rise into prominence; in fact, one cannot tell that the plants are in bloom unless he looks down into their centers.

The blue flowers are borne in spiral arrangement along the sides of this thick stalk, the blossoming beginning at the bottom. A few flowers open each day and after a number of days the blossoming on any one plant is complete. Normally no seeds form, even when bees work on the flowers, but in two or three fruits in every 10,000 seeds appear, no one knows why.

After the flowers fade the fruitlets begin to grow and the crown appears. Each flower gives rise to a fruitlet, or as commonly called, an "eye," but these are so close together that they become merged into one structure which we know as the pineapple fruit.

Approximately 80 per cent of all the fruit ripens in the summer months of June, July, and August. Three or four months after the first appearance of the flower heads the fruits are ready for harvest. The leaves are waist-high then, and the fields are beautiful in their paradise of gorgeous color.

At a certain stage of ripeness the sugars and flavor of the pineapple are at their best. To organize the harvesting of thousands of acres so that no fruit is picked green when its flavor is inferior and sugar content low, and none is picked too ripe when fermentation has begun, is the work of the field superintendent, and it is work, indeed.

From the standpoint of activity the harvesting season is a great event. Groups of pickers with sacks over their shoulders labor from early morning until dusk, passing between the rows and plucking the ripe fruit by breaking off the stems. The bags of pineapples are carried to the



Harvesting the ripe fruit, the peak of the season usually coming at the end of July.

nearest roadway where the crowns are deftly severed with knives; then they are packed in lug boxes, hauled by motor trucks to the cannery, or to the nearest railroad loading station or the barges for transportation to the cannery .

The Ratoon Crops—An outline of the history of the first or plant crop has been given above. A great deal of money, \$400 to \$600, must go into an acre of pineapples before ever a fruit is picked. If there is to be a profit, one must get second and third crops from a planting. These are called the ratoon crops.

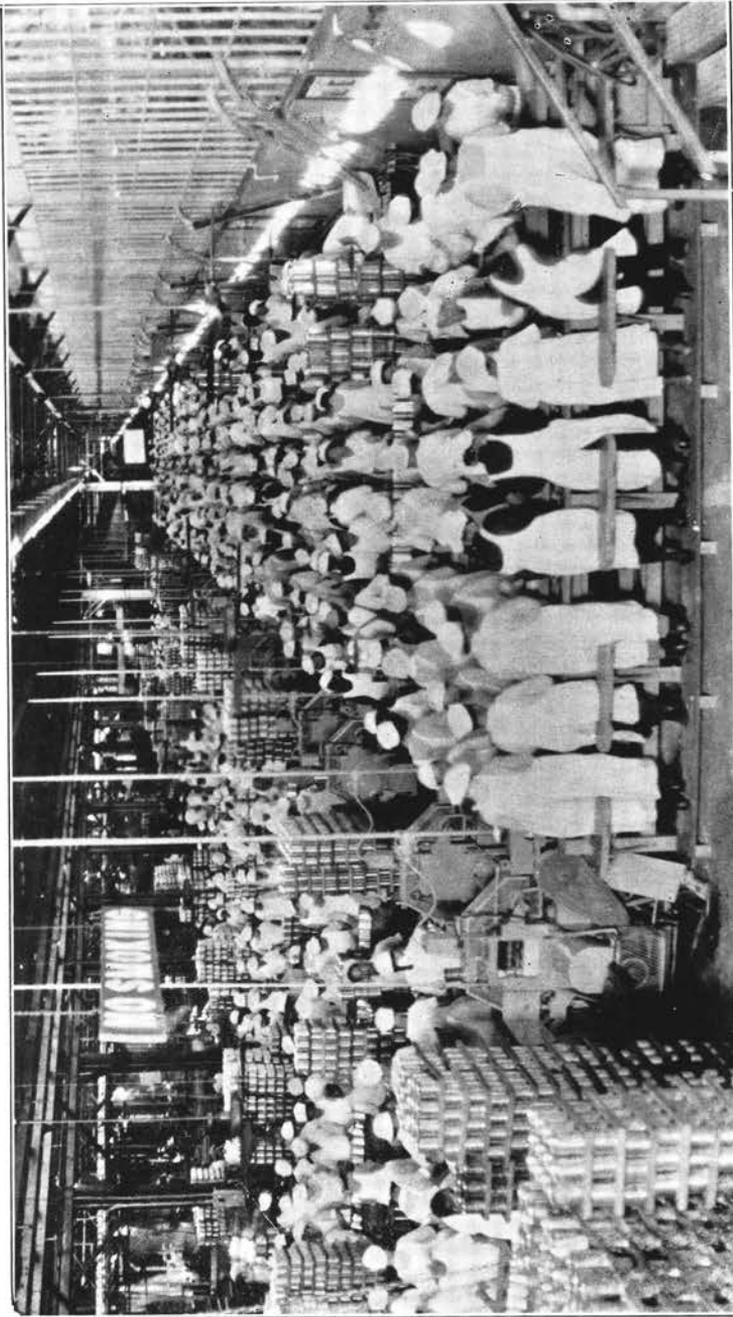
After the first fruit is taken from a pineapple plant some of the lateral resting buds of the main stalk begin to grow into new shoots. Part of these are removed for propagation purposes, but two are left for the ratoon crop and, normally, these should each produce a fruit the following summer. If the plants are healthy they should continue to throw out shoots which will yield a second ratoon crop or even more. The second ratoon, however, is usually the last crop harvested before the land is plowed for rest and replanting.

The remarkable ability of the pineapple plant to perpetuate itself indefinitely is

illustrated in one which was excavated from a fourth ratoon field in the best pineapple lands on Oahu. The plant had produced eight pineapples and had suckers which would have produced six more sometime during the year; the first and second ratoon suckers which had struck root were then going into the third ratoon, while those plants which had not struck root were going into the second. One slip had produced a first ratoon fruit and had rotted the connection tissue with the mother plant; nevertheless it was ready to produce a second ratoon fruit on a sucker. This slip had not struck root, neither had the sucker it had produced. Some of the roots of the original mother plant were still alive and apparently functioning.

The ratoon fruit is smaller than that from the plant crop and though a part will run large enough for the larger slices of pineapple, much of it furnishes material for the smaller cans.

Hawaii's Pineapple Canneries—There are 10 canneries in the Territory of Hawaii: Baldwin Packers, Ltd., Lahaina, Maui; California Packing Corporation, Honolulu, Oahu, and Kahului, Maui; Haiku Pineapple Company, Ltd., Haiku,



Trimming and packing tables in a modern pineapple cannery, of which there are ten in the islands. The work is performed by girls and women of all nationalities arrayed in white caps, long white aprons, and rubber gloves.

Maui; Hawaiian Pineapple Company, Ltd., Honolulu, Oahu, and Kapaa, Kauai; Kauai Pineapple Company, Kalaheo, Kauai; Kohala Pineapple Company, Mahukona, Hawaii; Libby, McNeill & Libby, Honolulu, Oahu, and Pauwela, Maui.

In 1931 the combined pack amounted to 12,726,291 cases, obtained from pineapples grown on the approximately 80,000 acres now devoted to the crop. For routine agriculture some 6,000 persons are employed the year around; and labor requirements are doubled during the summer months.

The peak of the season usually comes at the end of July and at that time additional thousands drawn from every race in the great melting pot of Hawaii are given work.

Making Pineapples into Pineapple—Visitors are welcome at the canneries; indeed, guides are appointed for the special purpose of showing them around. On entering, one is greeted by a confusion of noises—the whirring of wheels, the hissing of steam jets, the ceaseless rattling of cans on their overhead conveyors and the drone of human voices punctuated with the sharp blare of signals, and the lilt of gay music—all part of the busy industry with its varied responsibilities.

Hundreds of women are employed at the immaculate tables, working amid the flashing of knives and the endless, continually passing, fruit-laden belts. Chinese and Japanese, Portuguese and smiling Hawaiians, Filipinos and Porto Ricans; grandmothers, mothers of little children, and girls in their teens—all in white caps, long white aprons and rubber gloves—are trimming the fruit, looking for imperfections, stacking and sorting slices and packing them in cans.

The air is permeated with the tantalizing odor of fresh pineapples, piled on the fruit platforms, whizzing through the machines, being filled into cans and undergoing the transformation which enables them to be shipped conveniently to any part of the world.

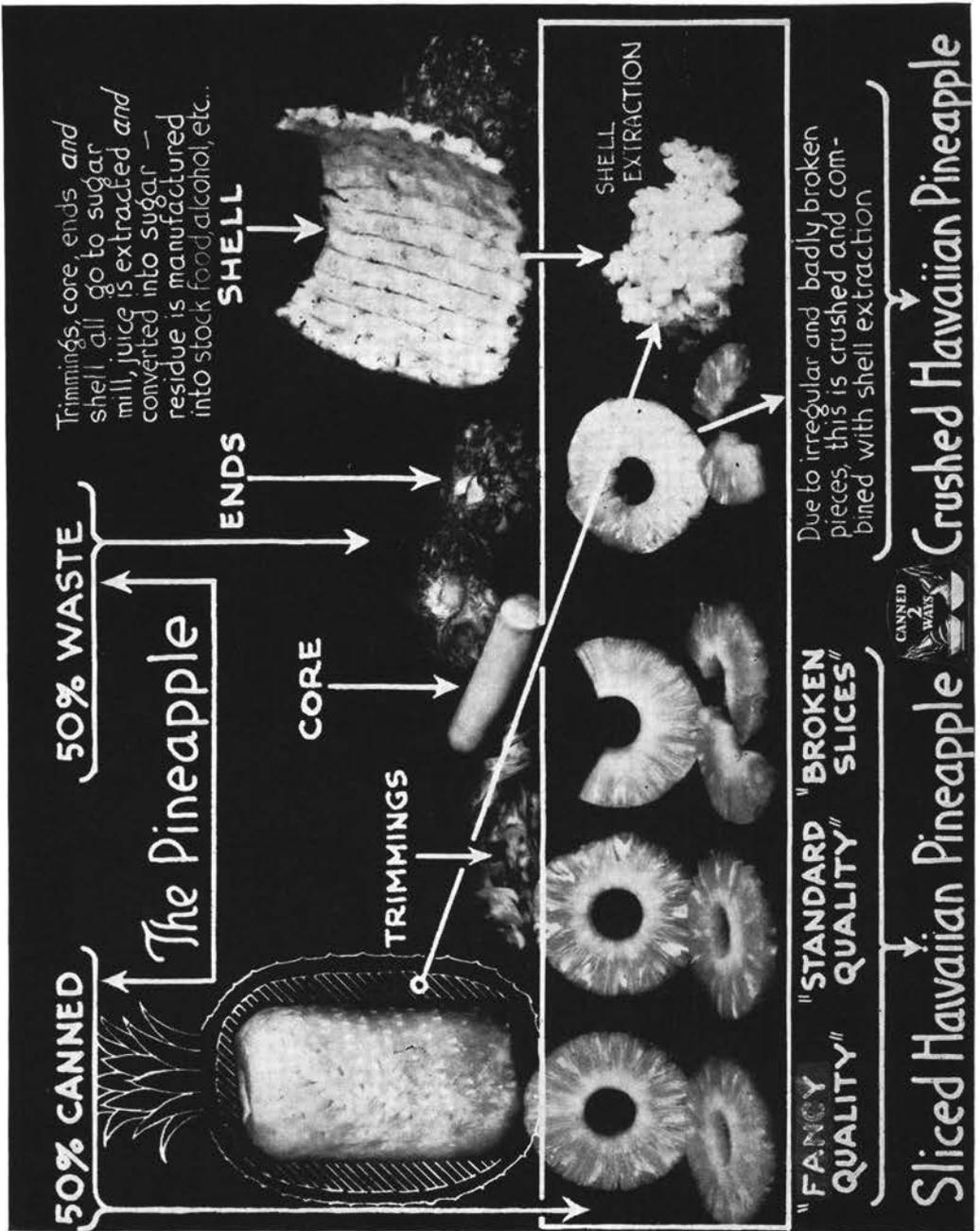
Canning the Pineapple—The fruit is trucked to the Ginaca machines, ingenious contraptions that, with rotating cylindrical knives, convert each fruit into a cylinder to fit the cans, removing the rind, punching out the core and trimming off the ends. As not all pineapples are the same size, the different machines are set to handle three different sizes. Some of them are capable of taking care of 80 pineapples a minute.

As the cylinders, cored and peeled, shoot out of the Ginacas they descend by chute to trimming tables where they are inspected and vestiges of peel and imperfections trimmed. Then, deposited on a chain, they travel through a spray of water and are conveyed to an automatic slicing machine where they are cut into a number of slices of uniform thickness with one stroke of an assembly of knives. Then they travel to the packing tables.

There the human equation means much in maintaining the quality of Hawaiian pineapple. Trained inspectors supervise the packers who, selected for their experience, good eyesight and sound judgment, make the proper choice as to grade and fill the cans as the fruit passes on an endless belt in front of them. Once the shell is off the pineapple it is exposed for only a minute or so before it is in the can, and during that time it is never touched by ungloved human hands.

The Processing Department—The trays of filled cans of sliced pineapple are conveyed to the processing department where, under the supervision of male workers, the fruit is given a vacuum treatment in which the small natural air pockets are exhausted and following that the syrup is added. From 70 to 80 cans a minute pass automatically through a machine where the syrup flow is carefully regulated, each grade getting its own distinctive kind from separate tanks in the "syrup house" overhead.

The unsealed cans with their contents then pass to a steam-heated exhaust box where they are heated to about 160 de-



grees F. and thence into a high-speed closing machine which automatically affixes and seals the covers by spinning the rims over the projecting lips. By sealing the cans when hot, the contents will be under a partial vacuum when they finally cool down after cooking. In an alternative process the cans filled with fruit and syrup are admitted to a closed chamber wherein a partial vacuum is maintained and the covers are sealed on them, thus assuring a final vacuum after cooking.

The correct cooking of pineapple has a great deal to do with the flavor. The sealed cans are properly sterilized in a cooker with steam temperature slightly above the boiling point. It is necessary only to raise the can contents to 190-195 degrees F. After cooking, the cans may be passed through a water spray cooler which reduces their temperature to about 120 degrees. The total time consumed in canning has been approximately 20 minutes. The finished cans are held on a cooling floor until down to atmosphere temperature, inspected for leaks, and sent to the warehouse.

Making Crushed Pineapple—Adhering to the inside of the rinds as they fall from the Ginaca machines is a layer of sound ripe flesh too good to discard which is dexterously scooped off and, with the comminuted broken slices from the packing tables, forms the popular crushed pineapple. The crushed product passes along on an endless belt before a long line of workers, equipped with forceps, who remove pieces of rind and any undesirable pieces before the material is cooked.

A specially designed pump lifts the product to the cooking floor above. Since it cannot be properly sterilized in the can as slices are, without overcooking, it is placed in steam-jacketed kettles equipped with mechanical agitators and thermometers and there heated to about 195 degrees F. in a few minutes; then it drops by gravity through stainless steel piping into automatic filling machines. When filled, the cans are sealed and cooled.

Pineapple By-Products—Juice that comes directly from the fruit at the packing tables is being marketed as canned pineapple juice. Though at present it is not being promoted, Hawaii exports 100,000 cases or 4,000,000 gallons annually. Juice is also recovered by pressing the rinds, cores, ends, etc. Some of this is clarified and used in making the syrup utilized in canning. One cannery makes and markets industrial alcohol from the juice, shipping 44,778 gallons valued at \$22,390 to the mainland in 1930. Citric acid, a white-crystallized chemical used principally in the drug trade for the manufacture of citrate of magnesia, is also recovered at another plant at the rate of 750,000 pounds a year.

The fibrous residue from which the juice has been pressed is reduced by drying to "pineapple bran," a palatable, nutritious food for live stock which, though it has been on the market but a short time, is in great demand.

The Modern Can—The modern can, it is evident, is far superior to the old-fashioned solder-topped type, not only because it is more sanitary but also because the sealing operation is accomplished in much less time. Made without solder except along the outside of the side seam, its bottom is rolled on in exactly the same manner as the top, freeing the contents from the danger of solder drops and noxious acids.

Today, the materials for cans are received in the islands in bulk and are there manufactured through a series of automatic machines into the several sizes used by the packers.

In 1930 the American Can Company produced in Hawaii the stupendous total of over 250,000,000 cans, practically all of which have been used as containers for pineapples. Factories for their making have been established on the several islands and a large force is employed throughout most of the year. About 40,000 tons of tin plate were used in 1930.

Shipping the Pineapple—When required for shipment the cans are taken from their stacks, again inspected and taken to the labelling lines of the packing department. Each canning company has its own labels and in addition dozens of grocery firms have placed theirs with the canneries in Hawaii. The cans are run through ingenious machines where, at the rate of 550 a minute, each picks up a label, rolls it around itself, and emerges ready for display on the grocer's shelf.

The labelled cans are then placed in shipping cases which have previously had stamped on them the destination and description; their covers are mechanically nailed, if of wood, or folded down and sealed, if of fiber, and they are trucked to the shipping platform whence they are transported to the waterfront, loaded into ships, and distributed to all parts of the world. However, because of the prohibitive tariffs in most ports, most Hawaiian canned pineapple is shipped to the mainland United States.

The Human Factor—It is an axiom that, since you cannot produce good canned pineapple without good plants, good fruit and good processing, neither can you do it without good workers. The safety, comfort, welfare and prosperity of the employees have, from the beginning, been of great concern; and, as huge factories have been erected and great fields of growing pineapples have stretched away to the horizon, so also have been developed facilities for the recreation and comfort of the employees and attractive, convenient villages for the workers.

For the field laborers and their families—largely Filipinos, Japanese and Chinese, with some Hawaiians and Portuguese—the plantations have constructed comfortable, sanitary villages with running water and modern facilities for lighting; they have provided medical attendance and have built amusement parks, boxing arenas and theaters for leisure-time diversion. Also, most of the field

work is done on a contract basis wherein a man is compensated directly in proportion to his industry and effort.

At the canneries there are cafeterias where hundreds may be seated and given warm, nourishing meals for as little as five cents; there are dressing and locker rooms for men and women, with hot and cold water, and shower baths; and attractive dispensaries in charge of graduate nurses.

There are nurseries where mothers who work in the cannery may leave their young children to play, learn, eat free meals and sleep; where the children are inspected by a graduate nurse and, if necessary, by a doctor; and where at the end of the day, they are bathed, fed again and returned to their mothers.

There are apron rooms where the thousands of white aprons and caps are made and kept after they are laundered and rooms where other thousands of rubber gloves are inspected, repaired and issued to their wearers each day. Some companies even have a stock participation plan for employees; bonuses, too, are offered for ideas; and cases of athletic trophies testify to the prowess of the teams that wear the canneries' insignia.

Canned Hawaiian Pineapple—Canned Hawaiian pineapple can no longer be regarded as a product of pleasing flavor with little or no practical value. In addition to being a thoroughly high-grade product of real utility, prepared under the best of sanitary conditions, it is valuable food and fills a worthy place in any diet.

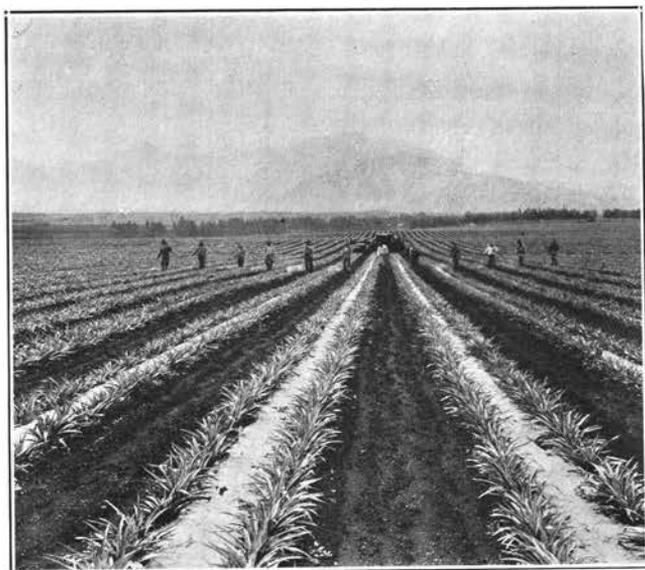
Experiments conducted in the department of nutrition of the University of Hawaii have proved that one of the common-sized cans of pineapple will yield about one-fourth of the calories required for an ordinary man for one day. Experiments have shown that the vitamins A, B, and C are present in notable amounts in fresh pineapples and that the canning process does not destroy them. The fruit also contains mineral salts and fruit acid in abundance. The latter, one might as-

sume, would contribute toward an acid condition in the system, but tests have shown that the acids are organic, are used up in the body, and that their residual effect is to counteract acidity—thus pineapple juice, even when consumed at the rate of a quart a day, will not cause acidosis, but tend to correct it.

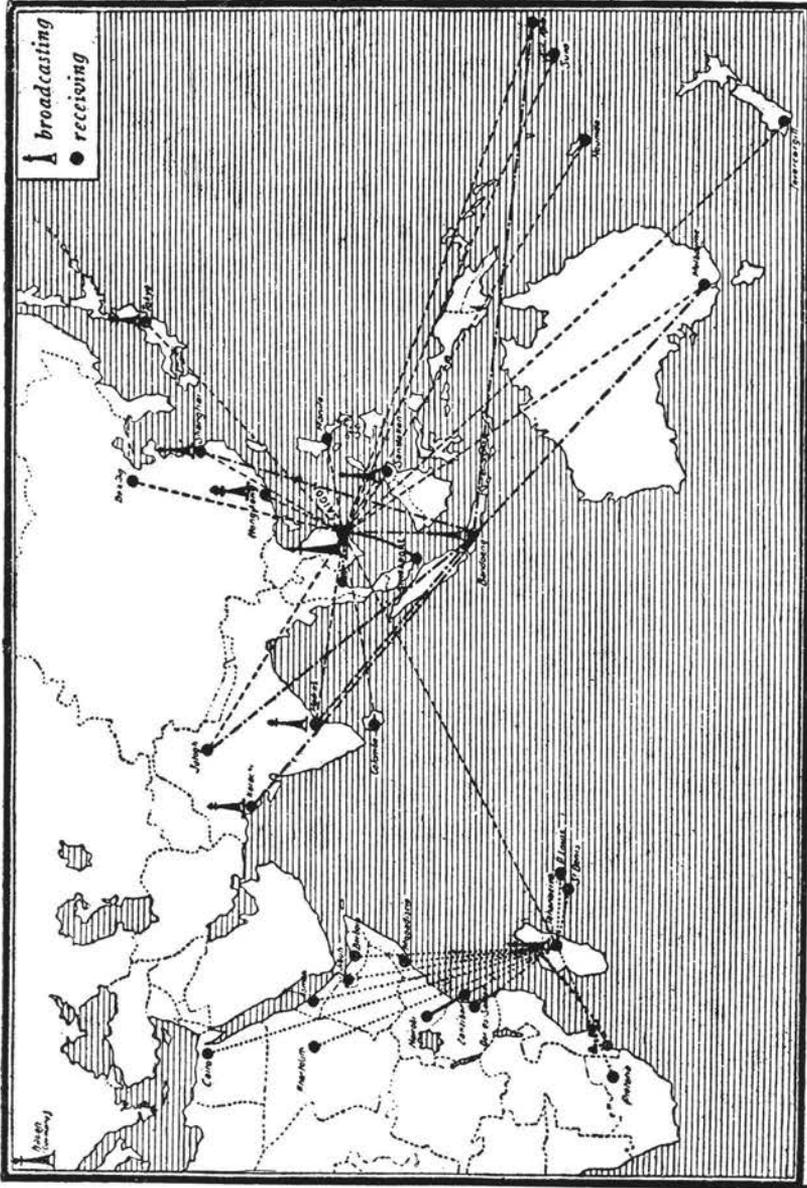
Today, Hawaiian pineapple in the can has been welcomed to such an extent that, except for corn, peas and tomatoes, its pack probably exceeds that of any vegetable. Indeed, mainland America con-

sumes as much canned pineapple as of its own most popular and most available fruit, the peach. It has proved its adaptability to so many uses in desserts, salads, entrees and for flavoring that it has become the fast friend of the appreciative housewife who well knows its value in the ingenious spacing of her days.

Canned Hawaiian pineapple is no longer a luxury; it is a necessity. And, in the last thirty years it has become the symbol of Hawaiian hospitality—Aloha-land's golden gift to the world.



Pineapples must have their tonic, and the growing plants take it in the form of iron sulphate, sprayed over ten double rows at a time.



The above map shows the network of wireless communications by which the health service of Eastern ports is organized and coordinated by the Eastern Bureau of the League of Nations.

JOURNAL

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THE DEBT OF THE BRITISH EMPIRE TO MEDICAL RESEARCH

By

Col. F. E. Fremantle, O. B. E., M. D., M. P.

(An address before the Royal Empire Society, London, January 19, 1932. In United Empire.)

Medical research, though a factor little appreciated in public, is of prime importance to national life at home and overseas. For the primary need of Empire is man power; and the primary need of man is health. That health costs money; but that money, wisely spent, is strictly, quickly and abundantly remunerative. Disraeli declared it impossible to overrate the importance of the subject. "The first consideration", he said, "of a minister should be the health of the people." Lecky referred to "the great work of sanitary reforms" as perhaps the noblest legislative achievement of our age which has probably done far more for the real happiness of mankind than all the many questions that make and unmake ministries." In 1925 the Secretary of State for the Colonies (Mr. Amery) said, "Not the least of the functions of the Colonial Office is to be an Imperial Ministry of Health".

Health and progress depend on research; just as military operation depends on reconnaissance and "intelligence". Without research, action is empirical and progress imperceptible. The story of the Panama Canal is an outstanding illustration of the value of medical research, not least, in this case, to the British Empire, for 1,783 British ships passed through the Canal in 1929. The attempted construction of the canal, by Ferdinand de Lesseps in 1882-9 and by the new Panama Canal Company in 1895-9, failed twice. And why? Largely owing to yellow fever and malaria; 22,000 laborers were lost; 1,000 natives imported from the West Indies and 1,000 Chinese perished within six months. The financial loss was colossal. But by 1900 the channel of infection in yellow fever, having been suspected by Fin-

lay in Havana in 1881, had been confirmed to be a living insect, the Aedes Aegypti, the Stegomyia fasciata or tiger-mosquito.

Other mosquitoes had been proved by Ross in India to be the channel of infection in malaria. Acting on the logic of these discoveries, Major Gorgas, of the U. S. Army, had cleared Havana of yellow fever. Following the same policy in Panama, Dr. Gorgas---under Goethals as Engineer-in-Chief and Chairman of the Isthmian Canal Commission--was given a free hand and generous supplies. He proceeded on up-to-date lines, clearing bush and swamps, proofing huts, screening and treating cases and suspects, and dealt successfully with the problem at a cost not exceeding one per cent. of the whole capital outlay. It was medical research that enabled the Panama Canal to be opened on August 14th, 1914.

For the story of this revolution in preventive medicine, this new conception of the transmission of disease by insects, with its vast potentialities for the health and development of the Empire, we must go back to the hideous and crippling tropical disease, elephantiasis, so called because of the swellings, especially of the legs, and thickening of the skin which gives superficial resemblance to the skin, limbs and features of the elephant. This is due to the choking of the minute channels, draining the lymph from the tissues which therefore become waterlogged. In 1874, Timothy Lewis, in India, after most painstaking research, found the criminal in the form of embryos of certain thread-worms or filariae; and Bancroft in Australia found the adult worms a couple of years later, in 1876, in

a lymphatic abscess. But it was Patrick Manson in Amoy, China, who in 1877 found, first, that the filaria embryos were present in patients' blood at night and not by day; secondly, that the filaria embryos were present and developed into full-grown filariae in the night-feeding mosquito, Culex fatigans; and, thirdly, that the development of the parasite from embryo to adult in the mosquito was a necessary condition of its existence as a species. In 1900, Low completed the proof by tracing the filariae into the proboscis of the mosquito, through which it is conveyed to the human being when bitten by the infected mosquito. The process, therefore, requires two bites by the mosquito to spread the disease; it bites first an infected human being and takes on board a cargo of embryos; these it develops into adult thread worms, with which it infects its next human victim. This discovery was of fundamental value for the prevention of elephantiasis. War on the mosquito and protection from the mosquito were practical propositions. The disease might with certainty be avoided, possibly exterminated.

Although this epoch-making discovery attracted little attention at the time and even excited opposition and hostility to Manson's views, it became a beacon-light to other enquirers, and there can be little doubt that it influenced later work on the transmission of disease by insects, as, for example, that of Theobald Smith on the Texas fever of cattle, conveyed by ticks, and the classical researches of Ross on malaria. Hence, in many directions, Manson's discovery influenced researches upon both human and veterinary diseases in the tropics and exercised an indirect but none the less certain--effect on the development of the British tropics. Medical men, indeed, have in general led the way in biological research, owing to the conditions and demands of their work and training, and have been pioneers in veterinary and botanical research, especially in the tropics.

Manson's conception, however, was based on one not very common disease; we must trace its extension to a wider field. In 1894 he suggested that the malarial parasite--discovered by the French military surgeon Laveran in Algeria in 1880, with a life-cycle in man corresponding to the phases of malaria, worked out from 1885 onwards by the Italian Colgi and others -- had an intermediate host, similar to that of filaria, outside the human body, and a suctorial insect was required for its development. He enlisted the aid of Sir Ronald Ross--then a Major in the Indian Medical Service -- to put his suggestions to the proof.

In 1895, Ross commenced his historic researches in India, working first upon human and then upon bird malaria. By 1898, through enquiries diligently pursued under trying conditions, he had demonstrated in the case of bird malaria the complete development of the parasite in its mosquito host, Culex fatigans, and its transmission from bird to bird by this mosquito. Prior to this he had also been able to work out to some extent the development of the human malarial parasite in the species of dapple-winged mosquitoes or Anopheles. The complete cycle and its effect in transmission of the disease was proved by the Italians, Grassi, Bignami and Bastianelli, after Ross had led the way and after his epoch-making work on bird malaria had become known in scientific circles. From this work and from what he had been able to observe in the case of the human malarial parasite, Ross had come to the conclusion that human malaria was undoubtedly mainly or solely transmitted by mosquitoes and probably by one particular species of these insects.

But Ross was not content merely to indicate how malaria was transmitted. Having proved the method he put the new knowledge into practice and advocated intensive campaigns against the mosquito-carrier of the parasite, proving his case in an effective visit to Sierra Le-

one in 1899. It was on this conception and on the analogy of elephantiasis (or filariasis, as it is now called) and of malaria that the American Commission under Reed, in 1900, incriminated the *Stegomyia* mosquito as the carrier of yellow fever, in a hurricane campaign against the mosquito, within 12 months completely cleared Havana and its densely crowded population of 250,000 of yellow fever, which had previously devastated it.

The solution of the project for a Panama Canal was thus revealed. In 1903, Panama, having declared its independence of Columbia, signed a treaty with the United States, under which work on the canal was begun in 1907. Twenty million dollars were spent on sanitation, and already, in his 1908 report Colonel Gorgas was able to write, "It is now three years since a case of yellow fever has developed in the Isthmus."

The work of Laveran, Manson, Ross, the Italian observers and the American Sanitary Officers in Cuba and Panama constitutes one of the most remarkable and important chapters in the history of medicine for all time. It has already greatly and advantageously influenced the development of many British tropical possessions, and its benign influence should steadily increase, provided the knowledge gained be properly and, as far as circumstances permit, fully utilized. This revolution in Imperial development is the direct result of medical research.

The hookworm (*Ankylostomum duodenale*) was found in 1880 by an Italian to be the cause of anaemia of miners making the St. Godhard Tunnel, and in 1854 by Griesinger to be the cause of Egyptian anaemia. In 1898 Looss of Cairo showed how the hookworm entered the human body by penetrating the skin of the foot. Its eggs finding their way into the intestine are scattered from the bowel, and so find their way from polluted earth -- the natural latrine of native races -- into the naked feet of their victims. The anaemia thus caused is responsible

for a vast amount of labour inefficiency all over the world -- estimated at from 25 to 50 per cent. in the tea gardens of Darjeeling. This problem is now being systematically tackled. It is reckoned that an improved efficiency of only 10 per cent. in the 45,000,000 infected in India would increase their earnings by £50,000,000 a year, and cover the whole of the Indian War Loan in three years.

Malta Fever has now been exterminated in Malta by the researches of the late Major-General Bruce of the British Army Medical Service. The disease, he found, was spread by the milk of infected goats; and it was a simple matter for military discipline to stamp out what had hitherto been a decimating disease in our tropics. The disease is now found to be due to a minute micrococcus, apparently of the same order as that which gives rise to contagious abortion in cattle; and the temperature chart has given it the name undulant fever, by which what used to be called Malta or Mediterranean fever is now known. Twenty-eight cases were reported in the whole war, half of them from South-West Africa, and only one death.

Cholera is, of course, one of the greatest pestilences of all time, and it was the great German research worker, Koch, who, in 1882, discovered the tubercle bacillus, and in 1883 the comma-shaped bacillus or vibrio of Asiatic cholera. From this arose, at a later date, the production of a protective anti-cholera vaccine, and the modern method of treatment which we owe to Sir Leonard Rogers of the Indian Medical Service.

The growth of the bacillus has enabled methods to be found and tested by which the infection can be neutralized, and pure drinking water provided and guaranteed. The result has given us an almost certain safeguard against this disease for those who have the means and the intelligence and will take the trouble, to avail themselves of the necessary methods. In Mesopotamia, where all these methods of protection against tropical diseases, as

and when they arrived, were properly enforced in the last two years of the Great War, pure drinking water was provided not only in the larger stations but also in the smaller posts and units; and whenever an outbreak was threatened by the reports of cases, e.g., in the native population, the long-suffering rank and file of the forces, in addition to inoculation or vaccination against typhoid, smallpox and perhaps plague, were also vaccinated against cholera. The result was only a few cases from time to time, and no outbreak of any serious importance. The same story can be told in our tropical possessions in all parts of the world; another life-saving achievement, to be numbered probably in millions, and the direct result of medical research.

Leprosy.--The hideous disfigurement and mutilation of leprosy--a byword in Biblical and classical history--affecting, it is reckoned, in the present day some 10,000,000 persons of the human race, was found by Hansen in 1874 to be due to a bacillus of its own. This enables us now to distinguish those cases in which the bacillus is still found and the disease is still active and contagious from that large number of cases in which the disease is no longer active, and the patients can safely be returned to normal life.

Here, again, we are indebted to Sir Leonard Rogers, who has worked out the modern treatment of certain drugs, chiefly derived from chole-mogra oil, which effect an almost certain cure in early cases. This enables treatment to be effected in out-patient clinics, without the necessary isolation of every case. The cures thus effected encourage patients to come forward willingly for treatment, knowing that they are not thereby to be cast out of society and condemned to a living death. It gives a prospect too of a very great reduction of the disease and of the expensive accommodation required for the life-isolation hitherto considered necessary. It has been a work of wonderful humanity for the natives of South Africa and India.

Sleeping Sickness is due to a single-celled organism with a lash like a pennant, for which it is called a trypanosome. Bodies of this kind were found in 1880 by Evans in India to be the cause of Surra -- a fatal malady in horses, cattle and camels, and in 1894 the hero of Malta fever, Bruce, discovered in Zululand the trypanosome of the African cattle disease nagana, and proved that it was conveyed from wild game, and from sick to sound animals, by the tsetse fly. This enables us to stop the spread of the disease by attacking the habitat of the tsetse fly, especially by clearing the bush round a station or in belts across a country. But more research is required before we can guarantee to individual human beings or cattle living in infected areas such safety as we are able to guarantee in the case of smallpox, for instance, or the enteric fevers.

Beri-beri is an outstanding example of careful observation and continued research, especially by British tropical workers, with valuable effects on a large scale. As many here know, especially those who have lived in Singapore, this disease has a crippling effect on native, especially Chinese, labour. It is of the nature of a neuritis, and the cause was traced by Bradon in 1907, in Malaya, to the eating of polished white rice, and by Stanton and Fraser to the fact that the polishing of rice removes the husk, which contains what we now know as a vitamin necessary for health. Beri-beri, in other words, is a diet-deficiency disease, which is now easily prevented or cured by making up the deficiency.

Scurvy and Beri-beri.--As regards deficiency diseases, in Mesopotamia in the great war the British ration was, on the whole, satisfactory; but in respect of the vitamins which prevent beri-beri it depended on the supply of fresh meat, as the bread was made chiefly with white flour. The Indian ration was rich in these vitamins in consequence of the atta, a wheat flour containing the germ and some of the aleurone layer, and dhall,

containing the germ and coat of the lentil. It was, however, deficient in anti-scorbutic vitamins.

There were no cases of scurvy amongst British troops, probably because of the better condition and the larger quantities of fresh meat and vegetables which they received. There were, however, some cases of beri-beri, such as never appeared amongst the Indian troops, who had plenty of anti-beri-beri vitamins in the atta and dhall.

The cause of the deficiency diseases in Mesopotamia was fully recognized by the D.M.S. and the consulting physician--yourself, Sir# --and steps were taken by them to put the ration scales on a scientific basis. In July, 1916, a revised scale was authorized, and the following table indicates the effect of these changes:--

July 1 to Dec.31	Scurvy (Indians)	Beri-beri (British)
1916	11,445	104
1917	2,199	84
1918	825	51

Tamarind was considered to have anti-scorbutic properties, but the lime-juice issued up to the end of 1916 had no such value, as it was probably over six months old before it was issued. In August, 1916, fresh lime-juice was prepared in India from fresh limes, a small quantity of alcohol and salicylic acid being added as a preservative. This gave better results. After the capture of Bagdad, lime-juice was prepared from limes and bitter oranges obtained locally, and issued to the troops with the least possible delay.

The diminution of beri-beri amongst British troops was probably related to the addition of oatmeal and dhall to the British ration in July, 1916, to the issue of marmite, and to the issue, at Colonel Willcox's suggestion, of bread containing 25 per cent. of atta. After May, 1917, on receipt of a report from England by Miss Chick and Miss Hume, on the
The Chairman

germination of pulses, germinated dhall was used in outlying districts when fresh vegetables or fruit could not be supplied and must have exercised a considerable influence in the prevention of both scurvy and beri-beri.

Plague, bubonic plague, the Black Death of 1347-9--one of the Imperial diseases--due to the bacillus *Pestis*, discovered in 1894 by the Japanese, Kitasato and the French Yersin in Saigon, has been responsible in the last quarter of a century for millions of deaths in India as elsewhere. In 1903, it was proved by Captain Liston, in India, to be transferred by a flea, but only by a particular brand of flea who prefers rats to human beings. This discovery, and the production by Haffkine of a protective vaccine, have enabled us to check, and to a large extent prevent, the spread of outbreaks of the disease, which has a disastrous history in the British Empire from the days of the Plague of London in 1665, with its 97,000 deaths, and indeed long before. Our mastery of the disease is far from complete; but with proper effort it should, by the end of this century, be as rare as yellow fever is to-day.

Dysentery, or the Bloody Flux--the scourge not least of white people in the tropics--is not a disease but a group of symptoms due to various makers of mischief of which the two most important are an amoeba and a bacillus, discovered, respectively, in 1875 by Losch and in 1897 by Shiga in Japan. The dysentery, due to an amoeba, although it does not occur in epidemics, is noted for the dread liver abscess, to which it gives rise; for its effects in sapping health and energy; and for the chronic condition which, since the war for instance, has filled the hospitals of our Ministry of Pensions. But thanks again to Sir Leonard Rogers, we have in emetin, the active principle of ipecacuanha, a valuable means of treatment; and in proper sanitation a considerable measure of control. Bacillary dysentery, on the other hand, occurs in outbreaks, at home as well as in the tropics, and offers a useful field for further research.

But not least should we mention the triumph of research in the fight with Typhoid and Paratyphoid, A, B, and C, generally known as the enteric fevers. Stewart and Jenner, a century ago, distinguished typhoid from typhus fever; Eberth, in 1880, isolated the typhoid bacillus; and about the turn of the century a vaccine was introduced by Sir Almroth Wright and Sir William Leishman, and anti-typhoid inoculation became practicable. Its value is clearly shown in the official figures for the South African and great wars. In South Africa, between 1899 and 1902, there were 58,000 admissions to hospital and 8,000 deaths, giving ratios of 104 and 14 per 1,000 of strength. In France and Flanders, 1914-18, there were only 7,500 admissions, under 300 deaths, giving ratios of under $1\frac{1}{2}$, instead of 104 admissions per 1,000, and .08 instead of 14 deaths per 1,000 of strength. A greater proof of the practical value in saving of life, suffering and efficiency from effective application of the findings of medical research could not be left to the imagination.

Let us sum up the practical policy before us to apply these researches to the prevention of disease and the improvement of health throughout the Empire.

Firstly, and above all, it is necessary to promote personal health, alike in the provision of the necessary conditions of working and living and in the personal habits and practice of daily life. Pure food with its proper share and variety of the various factors, including vitamins, salts and freshness, is one essential; pure water and plenty of it another; suitable clothing a third; proper housing and a sufficiency without excess of sunlight and circulating air are no less essential, with satisfactory removal and disposal of refuse and cleanliness of premises and surroundings.

Conditions of work, both in higher and lower grades of employment, European and native, must frankly take account of any insanitary circumstances; prevent or avoid them

where possible; and if impossible must temper the wind to the shorn lamb.

The dangers are mental and psychological as well as physical and physiological. Many tragedies of alcoholism, melancholia and suicide are directly due to the rules of the Service and to thoughtless administration.

The nightly, weekly, yearly periods of rest are vital. Irregularities should be fully compensated. Physical or mental rest after physical or mental exhaustion is imperative.

Proper periods of furlough, proper terms of remuneration and pension, are essential.

Enforced celibacy is of the devil, and facilities for family life, for entertainment and social and cultural amusement are necessary. Gramophones and the wireless, postal services, motors, road, railway, air and steamship communications are of direct value to health in the tropics to meet the needs of efficient work, as shown by physiological and psychological research.

But, secondly, the co-operation of the individual is essential. He must apply the provision so made to his own needs, his capacities and his task, guarding alike against deficiency or excess in any particular; he must curb his own tendencies in certain directions, stimulate them in others; he must watch for the first signs of failure, infection or injury; and take steps, often steps within his own powers, to remedy them. Failure to remedy them must be acknowledged, and help or relief must be demanded in time.

Such cooperation is his duty; such demand is his right; and the conditions here outlined, if mutually observed, have proved themselves to be good business.

Thirdly, however, it is clear, that the authorities--official and non-official--must take the main steps to protect individuals from infection; to treat and control

the spread of disease; and even international extermination of specific diseases. Isolation of the white from the native population is of great importance, land-drainage, clearance of vegetation, segregation of animals, elimination of the breeding-place of carrier-insects, rat and fly destruction--these are of special importance in the tropics. But here there is no less need of up-to-date sanitary inspection by natives trained to the work, working under trained supervision. The courses of training, examinations and certificates undertaken and issued all over the Empire by the Royal Sanitary Institute have played an invaluable part in the improvement of sanitary conditions; and the power to train and employ natives in such work was nowhere better shown than in Mesopotamia, under the acid test of war, when Arabs and Indians gave excellent service in the incineration of refuse and in the hunt for and destruction of the haunts of the mosquito.

Fourthly, it is necessary that good provision be made available for medical, surgical and obstetrical treatment, both for Europeans and for natives. This, instead of being the fourth, is generally the first and often the only effective medical service provided, for indeed it is the one service which gives confidence and excites compassion; and it corresponds to the instinctive need of humanity, commanding the chief attention even at home alike in practice, in the medical schools and in the public eye, and commanding therefore the highest monetary rewards and the highest public honors. As Jowett, the Master of my College at Oxford, shrewdly remarked, "Measures of prevention are never fully appreciated, because when most effectual they are never seen to be necessary."

But a proper service of medical treatment is admittedly essential for the efficiency and credit of any service; and such a service requires higher payment, justified both by virtue of the higher demands now made of it and of the rewards and conditions in medical practice

at home with which it has to compete for its personnel. In the tropics it requires white medical officers, nurses and dispensers with good hospitals for Europeans; while, for natives, dispensaries and a subordinate medical, midwifery and nursing service--to be trained locally in the course of time--will, with all its defects, under proper European supervision give the best results in the end. The work of the medical missions is beyond all praise, and will always play a useful part in the ultimate and main provision for most tropical countries.

On these lines, disease can and is being successfully fought, and life in the tropics at its best is becoming, for healthy men and women, as healthy as life at home.

Consider for a minute the remarkable health figures for the forces in Mesopotamia, British and Indian, including followers, showing a daily sick-rate for non-battle casualties in 1918 of only .19 per cent. of strength as compared with .16 per cent. for France and Flanders that year; and an annual death-rate from sickness reduced from 29 per 1,000 in 1916 to 12 per 1,000 in 1918 for the whole forces; and for British troops only from 43 to 11 per 1,000. The thousands of lives thus saved, the achievements thus made possible, not only for victory but for the future good of the country, must be directly credited in the first instance to the sanitary measures, properly applied without reserve by military authority, based entirely on medical research. Contrast this with the West Indies over a century ago, where 90,000 British troops perished in a few years; with the Walcheren expedition, which failed in 1809, owing entirely to fever, which attacked 30,000 officers and men and killed 3,469; or again with the Crimea, where dysentery and cholera largely accounted for a mortality of 230 per 1,000 of strength; or, finally, with the South African campaign, where over 8,000 deaths were due to enteric fever as compared with 7,000 killed in action. And yet the Medical Department is

considered a subordinate arm of the Service!

As I have said, research and its application require international co-operation, for epidemics spread like wild-fire along lines of communication through susceptible populations, regardless of race. The necessity of quarantine for ships from infected ports has long been recognized; and control under the International Sanitary Conventions, last revised in 1926, is fairly effective. The danger of spread, especially of insect-borne disease, by aircraft is real and serious, and a Convention to deal with it is now in draft. But great progress has been made since the war through the Health Organization of the League of Nations, with its own Health Section at Geneva and with the Office International d'Hygiene Publique in Paris as its advisory committee. Fifty-one Governments are here represented, including those of the British Empire; expert commissions are sent out all over the world from China to Peru to study the prevalence of particular diseases on the spot of their special incidence, to discover their cause, their extent and the means for their prevention, and to give any advice required. A weekly bulletin is published of cases of infectious diseases reported by wireless and cable from every part of the world.

An Eastern Bureau has been established at Singapore, and is proving of special value to all parts of the Empire in and around the Pacific Ocean. The munificent Rockefeller Foundation has given generous and impartial help, not least to the health requirements of the British Empire, with its scientific services of the highest order, soundly based on an ample foundation of efficient world-wide research.

And all over the world, medical research continues incessantly day and night, not only in laboratories but also in the surgeries and studies and courtyards of medical men and women, not for gain but because of the fire within them--their love of the chase, in pursuit of truth,

and their love of humanity in the prevention of preventable suffering.

Time was when each such worker worked for his little area, his patients, his immediate problems alone; and most of such work was lost to the world. Now, however, each worker, each center of work, is a collecting station for the world of medical knowledge, conveyed, collated and distributed through all literate nations by countless journals, conferences and discussions.

Of voluntary societies, mention may be made of two which definitely set out to collate and apply the results of medical research to the Empire, namely, the British Empire Leprosy Relief Association, and the British Empire Cancer Campaign.

Of private endowed institutions, the Lister Institute and Sir H. Wellcome's Bureau of Research and Graphic Museum of Tropical Health are the most noteworthy.

Of the official agencies, the Medical Research Council pursues its invaluable work of co-ordinating and inspiring research, carried out in countless laboratories with the assistance of Government grants, free of Parliamentary or departmental interference, under the sheltering auspices of the Privy Council.

But the Colonial Office has also of recent years taken an active interest in the matter of medical research, and its application to the problems for which the Department is responsible. The Colonial Medical Research Committee have issued summaries of the Annual Medical and Sanitary reports of the British Colonies and Dependencies, henceforth to be issued by the Bureau of Hygiene and Tropical Diseases, set up by the Colonial Office; and from the "Papers relating to the Health and Progress of Native Populations in certain parts of the Empire," published last year, there is evidence both of progress being made and of the active influence of Downing Street to that end.

But this progress depends very largely on the special education of those who can take part in it and direct it. The post-graduate teaching of public health, formerly a puny appendix to the medical schools, has been revolutionized in London since the war; and thanks to the generous gift of \$2,000,000 from the Rockefeller Trustees and the undertaking of the British Government to maintain it, the London School of Hygiene and Tropical Medicine, in its vast and admirable building behind the British Museum, has concentrated the teaching of Public Health, whether for this country or for the tropics, under one roof as a school of the University of London.

Here, for the first time, the whole subject of Public Health has been properly apportioned between its several divisions and departments under nine professors with other readers and teachers. Research work is carried on, to the benefit of the school as well as of the outside world; the library and the graphic museum are of special value and interest; the short-time courses for laymen--official or civilian--should have a part in the recognized preparation of everyone proceeding to residence in the tropics.

Following his father, the pioneer of tropical health in British policy, Mr. Neville Chamberlain, who laid the foundation stone of this modern temple of health in 1924, has written, "we find ourselves directly interested in the investigation of the diseases associated with the tropics, on the mastery of which depends the prosperity of vast regions within the Empire." One of the most lovable of men and one of the greatest of pioneers in the cause of Imperial Health, the late Sir Andrew Balfour, the first Director of the School, insisted throughout his life on medical research and on appropriate education as the foundation of sound progress in the health of the British Empire. Professor Ray Lankester once declared that if present knowledge could be properly applied, all communicable disease would be stamped out in 50 years. Let this then be

our objective.

The promotion of health is not only true philanthropy; it is sound elementary business. As Andrew Balfour has written, "No such crusade under the banner of health has ever been witnessed as that which is now being prosecuted in well-nigh every portion of the British Empire."

I appeal to you, I appeal to the Royal Empire Society, to add your weight in favor of this crusade. It is useless for us to pretend that its importance is recognized. If it were recognized, Manson and Ross, who have saved millions of lives and given incomparable values to the Empire, would surely have been acclaimed and rewarded as fully as the generals and admirals and inventors of the war. If it were appreciated, there would be no stint of money for the research, education and administration required, when millions of pounds are spent on engineering works of far less productive value.

It is to you and to those who, like you, have personal knowledge of the real value of health to the state, to impress these conclusions on your friends; to help to raise the credit of medical research and health work in the public estimate; and to secure the assistance of private benefactors as well as of public authorities in a work so rich in value to the peoples and territories of our world-wide Empire.

After interesting discussion on Women and the Tropics, the Chairman Sir William Willcox, said they had all been astonished at the extraordinary field Colonel Fremantle covered. He seemed to have dealt with almost every disease, and also with the public health aspects of tropical medicine. He supposed there were very few people living who had had such a very wide practical experience of medicine in all parts of the world as Colonel Fremantle. "If I tell you a few of his exploits you will appreciate the sort of man that you have been listening to. He is a fire eater because he was

a war correspondent in the Russo-Japanese War. I can bear witness to the very valuable work Colonel Fremantle did in Gallipoli and in Mesopotamia because I was out with him in both of these seats of the war and I witnessed what he did. He held in Mesopotamia one of the most important medical posts. He was head of the sanitation for the base and for the lines of communication. Basra, as he has told us, was the place where plague and cholera and many of the diseases were being introduced into the war. Then Colonel Fremantle has a brilliant record in this country. He has held most important public health appointments and he has taken a leading interest in housing and everything which is calculated for the better improvement, socially and hygienically, of our nation. Colonel Fremantle has made out a very strong case for medical research, and he has been most ably supported in that by two

of our speakers, Dr. Drummond Shiels and Professor Jameson. I am sure everyone in this room will agree with me when I say that not enough money is spent on medical research in this country. It would be a very valuable investment if more encouragement were given to medical research, not only for diseases in England but for diseases in the distant parts of our Empire. I would like to add -- and I know Colonel Fremantle will agree with me -- not only medical research but veterinary research. The condition of veterinary medicine in this country is deplorable as regards the support it receives from the State. It is really a public scandal. As we have heard to-night, many of these diseases which afflict men also afflict animals, and medical research and veterinary research go hand in hand. Money that is spent on veterinary research will be advantageous for medical research."

HAWAIIANS MADE USE OF MANY PLANTS FOR MEDICAL PURPOSES

By
Mrs. Arthur Greenwell

(Before the Garden Club of Honolulu)

Strictly speaking, medicinal plants of the Hawaiian group are not garden flowers, although among them are some of our favorite trees and shrubs; others make our country roads gay with blossoms; still others we look upon as just plain weeds and hasten to pull them up, with no regard for their many virtues, if they intrude among their more aristocratic sisters in our gardens. In former times the Hawaiians made use of almost every plant, but unfortunately much of this knowledge has died out and many of the herbs themselves have disappeared as the lands were opened up for cultivation and grazing purposes. I am sure in the old days the kahunas had their herb gardens as the monks had them in the Old World. Many of these Hawaiian remedies are still in use, the information regarding them having been passed on from father to son. Some herbs were used alone or pounded up with salt, while other

remedies combined several plants. Some of these had as many as 18 or more ingredients. This was particularly true of medicine for broken bones. This took several days to collect, as the herbs grew in widely scattered districts.

The wild morning-glory, or convolvulus, of which there are numerous varieties, grows from sea level to far inland, up to the foot-hills. One of the varieties, growing near the sea, the Pohuehue, has long, vigorous runners reaching to high tide mark, heart shaped leaves and deep pink flowers. The roots and stems were eaten in former times when food was scarce, but as an exclusive diet caused dizziness, and its leaves have the same effect on animals. The seeds were in much repute as a cathartic. The Pohuehue is found in most of the South Sea Islands, and it is interesting to note that in the Society Islands

its name is the same as the Hawaiian.

A near relative to the above, the Koali-awahaia, grows on the lowlands and comes up in profusion after the rains. It bears large blue flowers which gradually change through the day from shades of lavender to a delicate pink in the evening. The stems and roots pounded together to a soft mass was used as a poultice to allay pain and prevent inflammation.

The Pilikai, another convolvulus, growing as its name indicates by the sea, has seeds used as medicine. The Uala, or sweet potato, I mention in passing belongs to the same family as the morning-glory.

Our most spectacular wild-flower is the Mexican thistle or Puakala. It grows in dry rocky regions and attains a height of from 2 to 6 feet. It has large delicate white flowers resembling a poppy and whitish green prickly foliage. The Puakala was noticed and mentioned by Captain Cook, and still grows abundantly in favorable localities. Although thoroughly naturalized and found here by the first collectors, it was undoubtedly introduced from the warmer parts of North America.

The root of this plant contains a large percentage of opium, and was used as an opiate for toothache, neuralgia, etc. The thick yellow juice was used for removing warts.

The Noni is a small tree with thick glossy leaves, and has curious potato-like fruit. These are fleshy and juicy, but tasteless, and the ripe fruit has a most disagreeable smell. This tree is a noteworthy example of ancient Hawaiian introduction; and was invaluable to the natives in many ways. It grows from sea level to several hundred feet into the valleys. In former times it was cultivated as a dye plant by the Hawaiians, who secured a yellow dye from the roots and a pink dye from the bark; with the addition of salt a very permanent blue color was

obtained. The ripe fruit of this tree is used to this day to relieve sprains, boils and carbuncles. The leaf is a remedy for eczema, it being applied and held in place with ti-leaves. The seeds of the mature fruit are beneficial for indigestion.

Whenever we see or wear an Ilima lei we feel that the plant has fulfilled its mission in life by providing us with these beautiful wreaths. But these flowers as well as the root and leaves of the plant are all useful remedies. These are compounded with other herbs varying according to the malady to be treated. A tonic, for instance calls for 8 ilima roots, a handful of the young shoots and flowers of the Uhaloa, the same amount of the leaves and shoots of the Popolo. This with other plants and sweetened with sugar cane is pressed and strained, and the juice taken so many times a day. The ilima is a lowland plant, growing on poor rocky soil, near the sea. The flowers are quite insignificant on the wild plants, but the cultivated ones are larger and more varied in coloring.

Not only for sickness were remedies provided, but the Hawaiian women, like their sisters of other lands, were not immune to vanity, and enjoyed beauty treatments as much as we all do. A plant called the Alani-kuaiwi was the principal ingredient. This is a tree similar to the orange, with yellowish flowers. Both flowers and leaves are fragrant. The bark is very bitter. It grows in certain localities in the mountains and is found on all the islands. The Alani beauty treatment was reserved exclusively for the royal family, and this would be the treatment given to the queen or princess. Leaves in sufficient quantity were taken and laid on a bed covering the space from the neck to the feet. A sheeting of tapa tightly drawn was stretched over the leaves. In the meantime, in preparation for bathing, twenty leaves were soaked in water over night, and dried in the sun during the day. Towards evening the patient was given certain food to eat and then bathed in this water to which

the Alani flowers were added. After this she was put to bed. This was repeated for five consecutive days. The bedding was then changed and new leaves provided and the process continued for another five days. This treatment not only improved the skin but protected it against certain diseases.

When we think of our drugs being weighed and measured to the least fraction of a grain or ounce, it is interesting to read this Hawaiian prescription:

One hatful of the leaves and buds of the Ala-ala-pu-loa; eight roots; half a hatful of Akoko buds, and

two segments of red sugar cane. Pound these thoroughly and then add about two pints of water. Mix the whole carefully and strain. Then add to the cleaned liquid about two tablespoons of burnt Ti-root juice. The entire mixture is then poured into a narrow necked gourd container and shaken. The patient then drinks about a tablespoon of the remedy.

There are many other wayside plants which serve a useful purpose, and some day their virtues may be recognized by science, but until that day comes they will grow and flourish, covering hills and fields with the refreshing greenness so typical to our lovely islands.

VALUABLE FOODS FOUND IN SEaweEDS

Certain seaweeds are valuable foods because they contain more iodine and valuable minerals than other foods, although they are seldom eaten in the United States, despite the fact they are basic foods in other countries, according to information made available at the Bureau of Fisheries of the Department of Commerce.

On the Pacific coast, about 15 species of seaweed are found which may be used in the manufacture of agar-agar, the most important edible seaweed in either America or Europe, it was pointed out. Only one plant thus far, however, is located in California. The following additional information on edible seaweed was made available at the Bureau of Fisheries:

Japan, where only 10 species of seaweed are found which may be used in the manufacture of agar-agar, is the world source of agar-agar today.

Irish moss, found in America only along the New England coast, is dried for commercial use principally at Scituate, Mass. Dulse, although not prepared for market, is used as a condiment in some parts of New England.

Seaweeds are used in America principally for their gelatin properties

in thickening ice cream, blanc-mange, candies and desserts. Agar-agar is also used in medicine. Seaweed products deserve a much wider use, for they contain more iodine than any other foods, besides other valuable minerals. Vegetables grown near the seacoast and drinking water there contain iodine drawn from the ocean, and from these, people living near the sea obtain the iodine needed by the body, but the inland sections of the country must have it brought to them, and sufficient seaweed in the diet would furnish the necessary iodine.

In some countries seaweeds occupy much the same place as green vegetables. In Japan they are of such commercial importance as vegetable foods that the natural supply is insufficient to meet the demand, so that much attention has been given to their cultivation. In 1929 the Japanese industry amounted to over 827,000,000 pounds of various seaweeds valued at approximately \$5,806,930.

More than 70 varieties are used for food by the native Hawaiians, and here, too, some highly prized varieties are cultivated. In Europe, Irish moss is the favorite edible seaweed; green laver and pink laver are used there for soups. Dulse is eaten by the Scotch people and

murlins by the Irish. The Chinese and Swiss ate certain seaweeds to prevent goiter long before the cause of the disease was understood.

Lately a great deal of seaweed or kelp meal has been used, in varying proportions, in the feeding rations of farm animals, and adds to the nutritive value of the ration.

Harvesting difficulties present one of the biggest problems to the California agar-agar industry. It is almost impossible to harvest the moss by machine because the best beds are located under very turbulent waters which soon put out of order any complicated mowing machines. Diving and handpicking is the most successful method and this requires a very industrious type of labor. After all these difficulties only one-sixth or one-fifth of the crude weed comes through as refined agar-agar. It is prepared for the market in two ways. One method consists of drying and bleaching in the sun, and the other consists of making a jelly of it, allowing the water to freeze out, and cutting the residue into thin strips and drying it thoroughly.

Agar-agar is one of the most useful products obtained from seaweeds. It is used in the manufacture of vegetable isinglass, capsules, candy, paints, and culture media for bacteriological research. During the European War it was successfully employed in the treatment of war wounds. It is supplied to the drug trade, commercially in dry

transparent crystals that are reduced to a coarse powder for medicinal use. It has the natural property of absorbing water and retaining it; and in medicine, the additional property of resisting the action of intestinal bacteria and of the digestive enzymes. It is prepared by boiling and may be eaten with milk or cream, or mixed with any of the ordinary cereal foods with the addition of salt or sugar.

The Irish moss near Scituate, Mass., is sometimes gathered by hand, but most of it is torn from the rocks by means of specially designed rakes. The rakes are long and have long teeth set close together. The product is prepared for commerce by drying in the sun.

Irish moss of excellent quality is now placed on the market in 1-pound and $\frac{1}{2}$ pound boxes, selling at retail for 45 cents and 25 cents, respectively; it is intended chiefly for making blanc-mange and is used as follows: Soak half a cup of dry moss in cold water for five minutes, tie in a cheese-cloth bag, place in a double boiler with a quart of milk and cook for half an hour; add half teaspoon of salt or less, according to taste. Strain, Flavor with a teaspoonful of lemon or vanilla extract if desired, and pour into a mold or small cups, which have been wet with cold water; after hardening, eat with sugar and cream. To make a demulgent, for coughs, place moss in cold water and heat gently until the liquid is of a syrupy consistence. Then strain and add sugar and lemon to suit taste.

KELP AND JELLY-FISH

By
W. E. Allen,

(On staff of "Catalina Islander", Biological Feature Service)

THE KELP CROP: For nearly two years we have been reading and hearing a great deal of comment about land crops and crop failures. Wheat and cotton have been especially prominent but a number of

others have been mentioned as having been either too big or too little. In some sections it is reported that grasshoppers have removed all question of size of the crop by the simple process of eating up every

growing plant before it had time to become a problem.

Few of us are accustomed to think of the sea as producing crops although it does produce one crop which is harvested in a way somewhat similar to that used for certain crops on land. A little way from the shore near La Jolla and at many other places along the California Coast there are beds (fields) of kelp covering hundreds of acres of surface of the sea.

At the time of our participation in the world war all of these beds received careful attention as crop producers. It had been found that kelp not only contained iodine but that it could be treated so as to yield potash and other materials for fertilizers and a number of other kinds of substances having more or less commercial value. After the close of the war it was found that the costs of harvesting the kelp and extracting these substances were too high to be attractively profitable.

But in the last year or two I have noticed a harvester cutting the kelp for treatment in a factory near San Diego. Naturally the men handling kelp in this way came to regard their crop in the same light that a wheat farmer would regard his crop on land. Therefore, when they found that the kelp beds were disappearing after the hot weather of July they wanted to know what was the matter. One of these men visited the Scripps Institution of Oceanography to see if he could get information there but none was available that was very satisfying.

Such specimens of kelp fronds as could be obtained were heavily coated with crust-like shells of animal growths which seemed sufficient to almost (if not entirely) kill the kelp plants. However, it is probable that these growths were only one of a series of kelp troubles coming with the excessively warm weather. The high temperatures probably made the plants sickly after which animal and plant parasites and hangers on proceeded to injure and to hamper them so much

that the fronds dies off at or near the sea surface. Probably they will be as good as ever in a few months. Meanwhile, the harvesters are losing their crop just as land harvesters often lose.

A JELLY-FISH NURSERY: I have known for many years that jelly-fish have certain complications in their successive stages of existence which include one stage in which they are fixed in position like plants and another stage in which they swim about without ever becoming fixed to anything. But I had not known that in the fixed stage they might crowd together and develop enormous colonies looking much like those formed by such plants as mosses and lichens.

On a visit of the U. S. Destroyer Base near National City last fall to see a ship docked for cleaning and painting I was accompanied by Mr. E. H. Myers, a graduate student at the Scripps Institution. While examining the "fouling organisms" composing a rough mass from one to several inches thick on the supposedly smooth bottom of the ship, Mr. Myers called my attention to grayish colored areas which he said consisted mainly of the fixed stage of a common kind of jelly-fish.

A week or two ago we made another trip to see a ship docked and Mr. Myers got great quantities of the animals which he placed in small aquaria in his laboratory room. Every day or two he goes out to the pier and catches a lot of microscopic creatures to feed them, making the catch by hauling a net of fine silk cloth through the water by the pier. He and I have agreed in estimating that about one-third of the bottom of the ship was covered with the attached stage of jelly-fish animals, certainly several hundred square feet in area with a dozen or score of individuals, to each square inch. How they all got food for themselves is a mystery.

But there they were, set closely together like the little seedlings in a nursery seed-bed, before they are thinned out for replanting or

for better growth. The ships on which these colonies are so abundant are those which have been lying idle at the Destroyer Base for two or three years. Evidently there is something about the locality or about the way that the ships lie quietly side by side in the "nests" which makes the place especially favorable for breeding jelly-fish, so that it may be a "nursery" in fact as well as in resemblance. Considering the millions on millions of individuals produced in this nursery, one might expect that enough free swimming jelly-fish would be produced to almost fill San Diego Bay. But, since they are not especially noticeable it seems that few of them ever live to become prominent in the swimming stage.

It is in the free swimming, bell shaped, jelly-fish stage that eggs are produced, from which young are hatched, which live with the parent for a short time before breaking away and finding a place to attach themselves. After one of these young things gets itself fixed on an oyster shell or other solid surface it grows into a small whitish tube a little larger than an ordinary pin and this has a lot of thread-like tentacles surround-

ing the mouth at the unattached end.

If conditions for growth are especially good, as in the Destroyer "nest" this tube may develop a bud at one side which grows out, breaks away, and becomes like the parent tube. Perhaps new tubular individuals may be developed from this kind of "budding" several times, and that may account in part for the great success of the attached animals in forming large colonies. Just now (in March) Mr. Myers finds that some of the tubular individuals have begun developing different kinds of buds by forming rings behind the tentacles, thus cutting off a section of the outer end of the tube. When released from its tubular parent this bud goes swimming vigorously about as a tiny jelly-fish (a little larger than a pin-head) which needs a lot of food to keep it going just as truly as did the fixed tubular stage. As they get larger these jelly-fish will probably be able to capture small fish as well as other small animals for food. They may become highly injurious to fishes where they are too abundant. On this account, one may be excused for hoping that most of those being developed in the "nursery" will be killed off in some way.

FUTURE WORK OF APIA OBSERVATORY THREATENED

The observatory at Apia, Western Samoa, was founded in 1902 by the German Government as the result of representations made by prominent geo-physicists. It was eventually equipped for research in seismology, terrestrial magnetism, atmospheric electricity, and electricity. The Germans took great pride in it, and their leading scientists worked there, no expense being spared to make the work complete and efficient. Owing to Samoa's isolated position in the center of a most interesting region, the observatory at Apia soon came to be recognized by the scientific world in general as a very valuable institution--the free use to which the records have been put is sufficient evidence of the importance attached to them.

In 1914 came the great war, and Samoa was one of the first prizes to fall into British hands, New Zealand occupying the Islands. The observatory's work was at once taken over and continued, New Zealand winning international approbation by providing facilities for the maintenance of the work....The New Zealand government still finds itself unable to commit itself to the provision during the next financial year of any larger proportion of the cost of the observatory than was undertaken during the present financial year, a sum totally inadequate to keep the observatory going without outside assistance.

(Extract from the "Fiji Times and Herald")

BULLETIN of the PAN-PACIFIC UNION

An unofficial organization, the agent of no government, but with the good will of all in bringing the peoples of the Pacific together into better understanding and cooperative effort for the advancement of the interests common to the Pacific area.

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HONOLULU

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AIMS OF THE PAN-PACIFIC UNION

From year to year the scope of the work before the Pan-Pacific Union has broadened, until today it assumes some of the aspects of a friendly unofficial Pan-Pacific League of Nations, a destiny that both the late Franklin K. Lane and Henry Cabot Lodge predicted for it.

The Pan-Pacific Union has conducted a number of successful conferences; scientific, educational, journalistic, commercial, fisheries, and, most vital of all, that on the conservation of food and food products in the Pacific area, for the Pacific regions from now on must insure the world against the horrors of food shortage and its inevitable conclusion.

The real serious human action of the Pan-Pacific Union begins. It is following up the work of the Pan-Pacific Food Conservation Conference by the establishment of a Pan-Pacific Research Institution where primarily the study and work will be along the lines necessary in solving the problems of food production and conservation in the Pacific Area—land and sea. Added to this will be the study of race and population problems that so vitally affect our vast area of the Pacific, the home of more than half of the peoples who inhabit this planet. The thoughts and actions of these peoples and races toward each other as they are today, and as they should be, for the welfare of all, will be a most important problem before the Union, as well as the problem of feeding in the future those teeming swarms of races, that must be well fed to preserve a peaceful attitude toward each other.

The Pan-Pacific Union is an organization in no way the agency of any Pacific Government, yet having the good will of all, with the Presidents and Premiers of Pacific lands as its honorary heads. Affiliated and working with the Pan-Pacific Union are Chambers of Commerce, educational, scientific and other bodies. It is supported in part by government and private appropriations and subscriptions. Its central office is in Honolulu, because of its location at the ocean's crossroads. Its management is under an international board.

The following are the chief aims and objects of the Pan-Pacific Union:

1. To bring together from time to time, in friendly conference, leaders in all lines of thought and action in the Pacific area, that they may become better acquainted; to assist in pointing them toward coöperative effort for the advancement of those interests that are common to all the peoples.
2. To bring together ethical leaders from every Pacific land who will meet for the study of problems of fair dealings and ways to advance international justice in the Pacific area, that misunderstanding may be cleared.
3. To bring together from time to time scientific and other leaders from Pacific lands who will present the great vital Pan-Pacific scientific problems, including those of race and population, that must be confronted, and, if possible, solved by the present generation of Pacific peoples and those to follow.
4. To follow out the recommendations of the scientific and other leaders in the encouragement of all scientific research work of value to Pacific peoples; in the establishment of a Research Institution where such need seems to exist, or in aiding in the establishment of such institutions.
5. To secure and collate accurate information concerning the material resources of Pacific lands; to study the ideas and opinions that mould public opinion among the peoples of the several Pacific races, and to bring men together who can understandingly discuss these in a spirit of fairness that they may point out a true course of justice in dealing with them internationally.
6. To bring together in round-table discussion in every Pacific land those of all races resident therein who desire to bring about better understanding and coöperative effort among the peoples and races of the Pacific for their common advancement, material and spiritual.
7. To bring all nations and peoples about the Pacific Ocean into closer friendly commercial contact and relationship. To aid and assist those in all Pacific communities to better understand each other, and, through them, spread abroad about the Pacific the friendly spirit of interracial coöperation.

Dr. T. V. Soong on the China Flood And Famine Relief

By ALEXANDER HUME FORD
Director of the Pan-Pacific Union

On the Yangtze River, China,
December 1, 1932.

China is awakening. We are inspecting three thousand miles of dykes in the flood district that have been erected within a year, all by hand labor, employing a million and a half flood refugees as laborers.

This construction is characterized by the American and British inspectors on this trip as the most stupendous piece of engineering accomplished in one year that the world has ever known, and it was all done under the supervision of Chinese engineers at a cost of seventy million dollars.

Perhaps the ablest and most lucid account of the work was given by T. V. Soong, chairman of the Flood and Famine Relief Committees of China and acting president of the Republic.

In his address to us on the *Kiang Hsin* at Nanking in the presence of the American Minister and many distinguished Chinese, he gave the following account of the work:

"On behalf of the National Relief Commission I welcome you to this ceremony to commemorate the completion of the dyke building program of the Commission. It is a happy coincidence that we hold this meeting on board a steamer on this river, for it was in the areas traversed by the Yangtze that last year's disastrous flood wrought the greatest havoc, and it was in these parts that the Commission carried out its major relief activities.

"Let us for a moment turn back to the tragic events that occurred in the month of August a year ago. You may recall that, due to heavy continual rains and a

series of extraordinary coincidences, this river rose until it reached on August 19th the unprecedented height of 53.6 feet at Hankow against a previous known record of 50.5 feet 62 years ago. The result was that, the river broke its banks, inundated large and populous cities along its course, and swept away the network of dykes that protected the countryside, causing immense destruction of lives and property. The same spectacle presented itself in the Tungting Lake country in Hunan, the Poyang Lake area in Kiangsi, and the Grand Canal-Hwai River country in Anhui and Kiangsu. Subsequent surveys showed that the floods covered a total area of over 35,000 square miles, the largest flood on record. You may also recall that to cope with this unprecedented catastrophe the National Government promptly created the National Flood Relief Commission. Realizing the seriousness of the situation and the limited resources that were available the Commission decided to combine all public and private resources for relief and prevention, and selected those measures which would yield maximum results.

"The plan as I outlined it on September 9, 1931, at the first plenary meeting of the Commission, consisted of giving immediate relief to the flood refugees, where they could be reached, in the way of food, shelter and sanitary protection; as soon as the water receded sufficiently, we were to repair or reconstruct the dykes to sufficient height and strength to withstand the normal volume of the river; and lastly we were to retain sufficient resources to help the spring sowing of the farmers and to assist them, as might prove possible, in the rehabilitation of their farms. Gentlemen, our operations have followed this outline and it is to

commemorate the completion of the more permanent phase of our work, the dyke-building program, that we meet here today.

"The work of reconstructing the dykes by the employment of flood refugees was recognized from the outset as the most important branch of the Commission's activities. We felt that only by restoring the dykes could permanent rehabilitation of the flooded areas be brought about. Realizing the impossibility, of undertaking the repairs of all the dykes of the flooded areas, the Commission restricted its operations to the main dykes along the Yangtze, the Hwai and their tributaries and to the Grand Canal. In addition we undertook the improvement of the channels which drain the lower areas of Eastern Kiangsu to the sea, and the deepening of the Sha and Yin Rivers in Eastern Honan.

"Time does not permit me to go into the details of the work of dyke construction. As many of us are about to sail up-river on a tour of inspection of the dykes, I may mention a few facts which may be of general interest. The engineering activities of the Commission were divided into eighteen districts of which seven were on the Yangtze, three on the Hwai River, two on the Han River, one each for the Grand Canal, the Tungting Lake and Honan, and three for that section of Kiangsu to the east of Grand Canal. Each district was subdivided into ten sections and each section was again subdivided into *twans*. Able-bodied flood refugees were employed but in some places laborers other than refugees had to be engaged to make up the shortage. The number of laborers reached a huge army of over a million men and when the work was at its highest peak on one day a total of 1,400,000 men were employed. Final statistics compiled by the Engineering and Labor Relief Division show that a total of 7,400 kilometers or nearly 15,000 li of dykes were rebuilt. A great deal of this was new work, and the

amount of earthwork done reached the colossal figure of 115,000,000 cubic meters. The engineering field staff numbered 4,620 men. When we take into account the amount of work done in the restoration of private dykes which the Commission subsidized in the flooded areas as part of the free relief program, one can imagine the far-reaching character of this phase of the Commission's activities.

Financially the Commission was greatly facilitated in this work by the purchase of 15,000,000 bushels of wheat on credit from the United States of America. Nearly two-thirds of this wheat went toward paying workers' wages in the dykes. The moving of this huge amount of wheat into areas where transportation facilities were lacking proved one of the most difficult tasks the Commission had to face. Furthermore in some places the workers demanded flour, while in other places laborers demanded rice. It was later found imperative to convert a considerable portion of the wheat and flour into money and to pay the laborers in cash instead. In all, the Commission expended in cash and cash value of supplies the not inconsiderable sum of seventy million dollars.

The task is now accomplished. With vast areas to cover, and with the ever-present danger that if the dykes were not restored in time, summer rains would cause the rivers to overflow again, and thus repeat the work of destruction of a year ago, it was a race against time. That we completed the work according to schedule is mainly due to the high sense of duty of the men responsible for it, from the Chief of the Engineering Division to the poorest refugee laborer. Had we faltered in this work we had set out to accomplish it is certain that instead of bumper crops and complaints of low food prices, we would now have a different story to tell. Once more I bid you a hearty welcome and those of you who participate in the inspection tour a pleasant journey."

Director Ford Visits China's Flood And Famine Area

By ALEXANDER HUME FORD,
Director, Pan-Pacific Union.

On the Yangtze River, China,
December 1, 1932.

Having been invited by the Chinese Government to be its guest for a month in company with some sixty Chinese and foreigners who are to make a survey of the famine and flood relief work in China, I have accepted.

We are now on the *King Hsin*, the largest vessel of the China commercial fleet, on the first stage of our journey, which ends above Hankow, more than six hundred miles up the Yangtze; then we take to trains, canal boats, and other means of transportation. On the voyage I have the companionship of some of the directors of the Pan-Pacific Association of China. Our old friend, Dr. Wu Lien Teh, is with us, as is George Fitch and others who have been delegates to our Pan-Pacific conferences in Honolulu. Dr. David Brown from America and the head of the famine relief work there, with Sir John Simpson, of England, are making the trip, and Dr. T. V. Soong, head of the executive yuan, is one of our speakers at Nanking.

In fact we lunched with Dr. Soong, acting President of China, and a number of the executive yuan, so that I had the opportunity of one or two chats with Dr. Soong in regard to the Pan-Pacific Union work in China.

The lunch was held in the building of the Moral Endeavor Association. This is the Y. M. C. A. idea in China, only the word "moral" is used instead of "Christian." There is no drink served at the meals, only grape juice, but then the Chinese are a temperate people and the omission of liquors at a feast goes unnoticed by them. The chef is one of the best in China and I was told that the superb banquet cost but two dollars fifty

a plate, say fifty cents gold. In this building there is a cafeteria at which excellent meals can be gotten for fifty cents Mex., say ten cents gold. At present only officers belong to this association, but it is to be enlarged in time to be a real Chinese "Y. M. C. A." or "Young Men's Moral Association." Near by is an extensive area of buildings devoted to the care and education of the sons of officers who died in defense of China, including children of those who died in the Shanghai incident.

On our steamer the ceremony of dedicating the completed dykes was conducted by T. V. Soong, virtual president of China. First we all did reverence, missionaries and all, to a Honolulu boy, bowing our heads three times before the picture of Dr. Sun Yat-sen. I never realized during his lifetime as we often chatted about education for China, that I was talking with a deity who would be worshipped after his death by nearly half the people of the world.

Of course, a visit to the magnificent mausoleum of Dr. Sun Yat-sen was the chief entertainment offered us. This magnificent mausoleum, probably the finest in the world, is in marked contrast to the ruined Ming tombs (once the pride of China) lying almost in the shadow of Dr. Sun's tomb.

From Nanking on began the official inspection of the completed dykes. The first dyke we inspected was across the Yangtze, a mile wide at this point. A launch ferried us across, then motor busses took us half a mile from the river edge to the second line of protecting dykes. These earthen embankments are built some three feet above the level of last year's flood (which was the greatest in sixty years). The land around was

green in the richness of agricultural products. Never had there been such a bumper crop, the river, while doing a two billion dollar damage, deposited in return soil from the mountains that fertilized millions of acres.

The earth for the embankments was carried from the land by day laborers, paid in American wheat, so that on one side of the dyke was a great shallow canal, a foot or two in depth. This, I was told, might be used for the growing of lotus, with its edible roots, the water chestnuts, or for the raising of fish. Sir John Simpson stated that the best protection for the sloping banks would be Bermuda grass, but that the peasants in the region were liable during a hard winter to dig up the roots for fuel and so injure the dyke itself. Sometimes more than a million laborers a day were employed on dyke construction in the flood famine region of China, work that might have been done with American machinery, had China been willing to have these million day laborers die of starvation.

The dykes near Wuhu were the most interesting. Our steamer docked for a day at Wuhu and we never went ashore. A tender conveyed us to the dykes first on one side of the river, then on the other. Here the dykes could be planted in Bermuda grass, as the place is well policed and the land is prosperous. The dykes leading to Wuhu are wide enough and solid enough for auto traffic, one of them having a pathway of stone slates, and along this dyke the humble life of China could be studied in detail.

Perhaps a thousand miles of completed dykes will be widened and used as automobile roads, but here near Wuhu, a large city, there is a constant stream of traffic—ricksha, sedan chairs, coolies bearing great bales, others with bamboo rods across their shoulders, from which depend baskets of vegetables and bundles of produce of every kind. All along the dykes, on the other side from the river, which may be far away, spring up villages, first of mud bricks and thatch, then of firmer material.

The Queen of Tonga Becomes a Dame of the British Empire

(From the *Pacific Islands Monthly*, October 19, 1932)

On Wednesday, September 7, His Excellency the High Commissioner for the Western Pacific, Sir Murchison Fletcher, K.C.M.G., visited Tonga, and on the following day held an investiture at the Palace. Queen Salote Tubou received at the hands of His Excellency the dignity of an Honorary Dame Commander of the Most Excellent Order of the British Empire, an honor that had been conferred upon the Queen of Tonga by His Majesty King George V on New Year's Day of this year.

Both Queen Salote and the Prince Consort wore native dress, as did also the Tongan nobles. A magnificent Tongan

mat, on which was woven the royal coat-of-arms, covered the floor.

The High Commissioner, addressing the Queen of Tonga, said: "Your Majesty, at the command and in the name of the King I invest you with the Title and Dignity of Honorary Dame Commander of the Most Excellent Order of the British Empire and as a mark of esteem and affection for Your Majesty and the people of your kingdom."

His Excellency then decorated Her Majesty with the regalia of the Order, which consists of a silver star with a gold center on which is inscribed, "For God and Empire."

The Pan-Pacific Club of Tokyo

Program of November 25, 1932.

Chairman: E. W. Frazar.

Speakers: John W. Penlington, correspondent, *Daily Telegraph*. Dr. James A. B. Scherer, writer and authority on Japan. Otoichi Kinoshita, executive director, Japan Trade Promotion Association.

E. W. Frazar: In the absence of our president, Viscount Inouye, who is now in Kyoto, and in the unavoidable absence of Prince Tokugawa, I have been asked to preside today.

Before calling upon the speakers I think I might mention something about our club, because we are beginning a new year. The Pan-Pacific Club is a truly international club, meaning that all peoples living around the Pacific Ocean are entitled to belong. It is nonpolitical, and is just an opportunity for us once a week to meet informally and make the acquaintance of famous people in or passing through Japan. To any who wish to become members we offer a hearty welcome.

Our first speaker today, and we have three, is Mr. Penlington, and I don't think I need tell you who he is or what has happened to him recently.

John W. Penlington: I hope I will not disappoint you, but I am not going to speak to you about bandits or about my experiences lately. Today I thought I would say something of what is developing in Manchuria among the human materials belonging to many races.

Who is the Manchurian? In his "Thirty Years in Mukden," Dr. Dugald Christie tells of the striking Manchu headdress of the Chinese women, who are not, as many suppose, of Manchu stock although they are Manchurian, and regarding the type he gives us this imaginary conversation to illustrate Chinese conservatism:

"Where do you come from?" you ask a man. "I come from Shantung." "How long have you been in Manchuria?" "Two hundred years."

There are, apparently, very few people who can claim to be of Manchu stock, and it is not improbable that the strength of the race was long ago dissipated in the struggle with the Chinese following the Manchu conquest of Peking. In the latest issue of the "Report on Progress" published by the South Manchuria Railway Company, we are told that there are only about 500,000 people of Manchu stock, and that these are chiefly settled in the Hailar region where, according to the same authority, official announcements are still made in the Manchu language.

The ancient language, or vestiges of it, is also preserved in another way—at funeral and wedding ceremonies. A young Jesuit priest, a Chinese, educated and prepared for the priesthood at the Jesuit Seminary at Ossining in the United States, informed me that the old Manchu ritual was commonly used for both ceremonies, though he doubted if the priests understood the language they recited. I was much interested in the views of this young Chinese. He was born in a village thirty miles west of Mukden, of a well-to-do family, and welcomed the change that had come in his native country so long as peace was maintained.

The Manchu, therefore, like the Ainu, may be considered a dying people, but the Manchurian, the man born in Manchuria, is up and coming, and his is a rising star. He is of many nations and races, but the type from which we expect the best results will be found in the schools of the large towns, in the Leased Territory, in South and North Manchuria; and whether his ancestral ties link him with Japan, Korea, China, Mongolia, Siberia, Europe or America, as he grows, so will he become more and more a Manchurian, a lover as well as a native of a splendid country.

Everything of course depends upon the continuance of good government and the preservation of peace. Within the Japa-

nese enclave, there has always been that feeling of security upon which alone a people can thrive, and in this connection we must not forget that it is the Chinese who have benefited most, the million or more industrialists, businessmen, and agriculturists who, in the Leased Territory and within the boundaries of the Railway Zone and Japanese municipalities, have for thirty years enjoyed a security denied to their compatriots of the Three Provinces. Because of this security, the Chinese demonstrate their superior capacity for business, just as they do in other well-governed lands—the Philippines, the Straits Settlements, Siam, and the Dutch Indies.

But it is to the schools we must look for the trend of future development. As a result of two rather lengthy visits to Manchuria, I find myself thinking most of the schoolboy and girl as I saw them entering and leaving the fine elementary and middle schools that have been built in Dairen and other towns. Here are the new citizens. Of Japanese among them, very few have seen Japan, and all hope to some day. So they have told me. Ten years ago my wife and I spent a very happy six weeks of travel from Dairen to Manchuli, and on one occasion a schoolboy entered our compartment and began to talk in English, showing none of the reserve characteristic of schoolboys in Japan. He told us that he was born in the Railway Zone, and daily traveled a good number of miles to attend school. Something had been added both to the stature and character of this boy by his life in Manchuria, and there was little doubt he would develop into a bigger and stronger, if not a better man, than his compatriot in the homeland. Climate and food would effect this change, and these are the two main factors which must not be overlooked in the evolution of the New Manchurian.

Almost ten years intervened between our first visit and my second, which was also to last five or six weeks but had to be curtailed. On this second visit I noted

many changes in the towns, the great extension of Dairen and the complete transformation of Mukden outside the walls. The greatest change, however, has been effected at Fushun, where a whole town has been removed in consequence of the sagging of foundations caused by the mining operations underneath. Fushun now has a population of 100,000, all dependent upon the coal mines and subsidiary industries. Like all the Japanese municipalities, the town is a model settlement. A day or two after my visit, it sustained a severe attack by soldier-bandits, who aim at destroying the pithead machinery. There was a pitched battle in the streets, and among the killed was one of the mine managers.

The Japanese in Manchuria is not going to surrender home comforts without a struggle, but environment is likely to prove too strong for him. I am now speaking of the adult, the settler, the man born in Japan, who finds in Manchuria what he regards as a temporary home. In his substantially built brick house, he has a Japanese interior. Row after row, and street after street of these houses in Dairen remind the Englishman of any Lancashire town, but the likeness ends with the outside. Moreover, wherever the Japanese goes, if he can he takes his bath with him—the famous Japanese bath which ought to be better known abroad. A question that occurred to me as I thought of the love of the home-staying Japanese for his nightly hot bath was—"What do the younger generation think of it?" The cold tub in England and the hot bath in Japan are domestic peculiarities probably best left to stay in the country of origin. In Manchuria, with its champagne air, the thought of bathing for the sake of cleanliness is not so insistent as in the humid atmosphere of Japan, against which man contends in vain and at nighttime resorts to the steaming hot bath for temporary relief.

In this brief review of social developments in Manchuria, the plantation of some five hundred ex-soldiers of farming

families in a part of the Sungari Valley 200 miles northeast of Harbin must not be overlooked, since it is the beginning of a carefully devised plan of the War and Overseas Department in Tokyo, the object of which twofold—to counteract the bandit menace, and to some extent to lessen the pressure of overpopulation in Japan. The district where these ex-soldiers are settled seems to give the whole scheme a strategic as well as agricultural and social significance; it is in the northeastern area of Kirin province, on the borders of a region which, according to Chinese reports, has long been encroached upon by Russian settlers, against which the Kirin government in years past made repeated protests.

Citizenship in the new state is open to all ready to conform to the simple requirements of the government, and it is interesting to know that among the first to apply for citizenship are a large part of the White Russian population of Harbin, some 5,000 in number. For years these people have been without protection of any sort, and according to report, have been shamefully mistreated. Russian men and women, loyal to the old régime, have had a bitter experience in Manchuria, and it is not surprising that they should seek the protection of the new flag. The new state may possess a valuable asset in these recruits, among them being men of education who occupied important positions before the Revolution of 1917.

Arrangements are being made by Japan and Manchukuo whereby all vexatious extraterritorial provisions and regulations will be abolished and superseded by an agreement giving the citizens of the two countries complete freedom of trade and residence, the privilege perhaps to extend to all nationals. This advantage in course of time must facilitate the commingling of the three nations that have so much in common—Chinese, Korean and Japanese,—who have the inestimable benefit of a great literature accessible to all and understood by all. In such a prospect to be considered remote or far-fetched? In

Manchuria there are, roughly, 30,000,000 Chinese, 1,000,000 Koreans, and 300,000 Japanese, including the military; there are some 80,000 Russians, 4,000 Poles, other nationals being negligible. Continued peace and good government must work great changes, and in the era of prosperity that lies ahead, how can the three nationals (to mention only the principal) remain mutually aloof and indifferent to each other's progress and well-being? They must in the long run coalesce. This seems to be the strong desire of the government at Hsinking, which aims at the consolidation of the new state by the union of all the elements in it.

Mr. Frazar: The address of Mr. Pennington has not only been interesting but informative, for it has told us just those things we cannot find in books and papers. It gives us a better view of the situation, and we all have to thank him for what he has said today.

Our next speaker is Mr. Scherer, who is not an editor, although he has written many books. He came here many years ago, and has always taken an intense interest in this country and things concerning it. During his present visit he is going to give lectures.

Dr. James A. B. Scherer: All of us have heard, many times, that the West represents action, the East the reverse. Anybody who crosses the Pacific seeking the life of passive contemplation is slated for surprise, unless, indeed, he keeps on to India. I landed in Tokyo a week ago today, at noon. A hospitable member of this club met me in the hotel lobby, and in a few minutes I was trying to keep up with Mr. Boa as he raced through the mazes of Manchurian finance. From that moment to this I have had no leisure but sleep. Last night I strolled out to find what Mr. Percival Lowell called the Soul of the East. He found it, I think, on the Ginza. Instead of the Soul of the East I found an American turkey dinner; instead of a soul-calming festival I found a carnival. The lights were so bright that I read Mr. Matsuoka's speech standing

on the street corner. Instead of peaceful Shinto music my ears were assailed by clanging tramcar and honking motorcar, while above all the radio voice of Mr. Lefty O'Doull shouted into the hurrying multitudes the esoterics of baseball.

I am not complaining of all this, I am only commenting on it. Somebody has said that vitality is the most charming thing in the world; and if that be true, the Ginza is quite as charming as Broadway. I doubt whether the Japanese have ever been a quiet and contemplative people. Endowed with superabundant energy, earthquakes have kept them on the jump, accelerating their inborn speed. The greatest Japanese himself was incarnate energy. As I invite you to think of him with me a few minutes today, it is not in the foolish presumption that I can instruct you in Japanese history. I merely desire to pay my sincere tribute to one of the greatest men of all places and all time.

He was great in his works. Some of them still remain, to vouch for him. In the village of Horyuji, a few miles from Nara, we may still see three of the buildings which the Greatest Japanese dedicated to Gautama the Buddha in the year 616 A.D., a thousand years to the year before Shakespeare died. Japan and her Elizabethan Age a thousand years before England's, and it is named after a woman, the Empress Suiko, although it was her nephew, the Regent of whom I am speaking, that made her brilliant reign possible. Down to that time the Japanese had lived an exceedingly primitive life, with a rude primitive culture. No sooner had Prince Shotoku seen the beautiful objects which early Buddhist missionaries brought over from Korea and China than he resolved that his people should make beautiful objects, too. From the mainland he brought over teachers: architects and sculptors, bronze-moulders and tile-makers, masons and weavers, painters and gilders, and, with his own people as pupils, set them to work on an amazingly ambitious dream. On the slopes of a beautiful valley, with

massive green mountains for background, he began to build one of the great temple-palaces of Asia, which he designed not only as a source of spiritual enlightenment to his people, but also as a school of the arts. Three of those buildings survive; the oldest wooden buildings on earth, twice as old as the oldest cathedrals of Europe. A great American architect, Ralph Adams Cram, has pronounced them the most precious architectural monument in all Asia. For purity of line he compares them favorably with the Parthenon and the Erechtheum at Athens. "Japanese architecture," says Mr. Cram, "is more nearly Greek than any other, for it is the perfecting of a single simple and primitive mass by almost infinite refinements of line and proportion. The result is, in plain words, final perfection. Beyond is no further possibility."

Teaching his people by example as well as by precept, Shotoku himself became a sculptor and at Horyuji one may see still what may be the tribute of his own hands to Buddhism—in a heroic figure of Kwannon, the god or goddess of mercy; unconventional, vital in every flowing line, the great benign face illumined with the most beautiful smile that has ever been carved upon wood. He wrought marvels of construction during the last five years of his life, including forty-six Buddhist temples in different parts of the Empire.

Mighty as were the works of his hands, mightier still was his influence. He transformed Japan; the transformation under Shotoku in the seventh century was every whit as spectacular as that second transformation that occurred a dozen centuries later. Japanese historians do not overrate him when they call him the Father of Civilization. "He left behind him peace where he had found strife and anarchy, the light of civilization in the place of the darkness of semi-barbarism, the knowledge and practice of art and science where there had been none before, reverential observance of a religion which was destined to mould the character of his countrymen for more than a thousand

years." When, in 621, he died, the ancient chronicles say that the farmer ceased from his plowing and the pounding woman laid down her pestle; they all said, "The sun and moon have lost their brightness, heaven and earth have crumbled to ruin—henceforth in whom shall we trust?" Nobles and commoners alike, the old as if they had lost a dear child, the young as if they had lost a loved parent, filled the ways with the sound of their lamenting.

So much for his work and his influence. When we come to consider his words, Prince Shotoku is still a genius. The most striking thing about them is their modernity. He was but little interested in the past, rather more concerned with the present, and supremely bent on the future. This comes out in his answers to his father, the Emperor Yomei, when the latter still questioned confusedly among the conflicting claims of Shinto, Confucianism (already introduced from China), and Buddhism. "There is really no conflict among them," argued Shotoku, in so many words, "Shinto is the rule of the dead. It deals with the past, and not with the present or future. Confucianism is concerned with the present, and is not in the least forward-looking. Only Buddhism teaches about the future, and, as all men are anxious about the future, it is inevitable that many should embrace Buddhism"—which his dying father decided to do.

In one of his penetrating essays, Matthew Arnold says that Thucydides is more modern than Sir Walter Raleigh. What he means, I think, is that the English writer is fusty and turgid; he lacks the greatest antiseptic of style; whereas in Thucydides there is an immortal freshness, as if he had written but yesterday. I find this same freshness in some of the writing of Gautama Buddha, or rather in his words as his disciples wrote them down, especially when he writes of love as the greatest thing in the world, or of the three cardinal sins. So also in the Japanese "Constantine of Buddhism," as

Shotoku has sometimes been called. In his Jushichi Kempo, the earliest written law of Japan, we may see illustrations of this. Where shall we turn for a more pithy definition of statesmanship? "To turn away from that which is private and to set one's face toward that which is public—this is the path of a minister." Some of his precepts echo the Bible, of which he of course never heard. "Chastise that which is evil, encourage that which is good." "Good faith," he further observes, "is the foundation of right; in everything let there be good faith, for in it surely consists the good and the bad, success and failure."

One of his sayings I have reserved for the last. It has a soothing and a modern note in these hours of clamor, and is to be recommended to those international statesmen whose raucous voices each insist on having the last word, whose only gesture seems to be the turning of a deaf ear to his fellows over the sea. To such speaks the voice of Shotoku, coming calm and sane through the centuries:

"Let us not be resentful when others differ from us. All men have hearts, and each heart has its own leanings. Their right is our wrong, and our right is their wrong. We are not unquestionably sages, nor are they unquestionably fools. Both of us are simply ordinary men."

Mr. Frasar: We all, I am sure, thank Dr. Scherer for his very interesting address. The last speaker is Mr. Kinoshita, and I think he has something good to tell us, too.

Otoichi Kinoshita: We made a tour of the world twice this year and last year, and twice in 1929 and 1930 in the United States, under the name of the Japan Business Men. We represented 21 trades and professions, and of our 40 in number, only two were ladies. We visited 14 countries, and I will tell you a few of the occasions when I had to correct my previous notions of Japanese merchants.

Formerly we used to hear Japanese merchandise called *Soseiranzo* which means reckless production, or below

standard. That was the condition of things about twenty years ago, but today it is quite different. In the United States I have many nephews and nieces, all of whom look to receive presents from Japan when I visit them, but I have great difficulty in finding things which I think will interest them. But now I know that it is the things you can buy on the streets, the cheap novelties, which they like best. Tourists in foreign countries experience the same difficulty, and they, too, have found that it is the cheap things bought on the streets that are most welcome. That is why so many Japanese novelties are exported. When we went into department stores abroad we felt ashamed at the cheap quality of the Japanese goods displayed, but those goods were there not because of any discredit to the makers or

exporters, but because of the curiosity of the people.

When in Cairo one day I ordered beer in a café, expecting to be served with German beer. But we were given Asahi beer, and when I asked if there was not a better kind, the waiter told me that was absolutely the best kind of beer.

The Japanese are said to be a nation of imitators, but one big example of imitation in the United States and elsewhere is the manufacture of rayon, where efforts are made to produce an article which resembles the Japanese silk. We had several conferences with American weavers regarding the competition with such imitation, and we decided to have more extensive advertising. The same thing occurs in the political field in Geneva, not only in the field of trade.

The Pan-Pacific Club of Tokyo

Program of December 2, 1932.

Chairman: Viscount T. Inouye.

Speakers: Mrs. Eliza M. Carr Flower, author; J. W. T. Mason, journalist.

Viscount T. Inouye: It is my great pleasure to introduce to you two guests of honor today, both of whom are renowned philosophers. As the first speaker I will call upon Mrs. Flower.

Mrs. Flower: I must emphasize my great surprise at being invited here today, because it is surely only the process of contrast that could have got me in.

But for my training I think perhaps I should not be so fascinated with the things that I see in Japan, because it seems to me there is no country in the world that is so stimulating from the standpoint of psychology. Whether Japan is aware of this or not, I do not know.

A great philosopher has said: "To cast off an old type of conception and forge a new one, is the very greatest of all practical moral accomplishments." When one

realizes that Japan has done the thing most psychologists claim to be impossible, has broken up the pattern of her life and worked out an entirely new one, and has yet held together as a concrete nation, it seems to me that it is the most provocative of interest and stimulation of any national problem in the world today. I have been amazed and astounded and interested beyond expression. I have wondered how it could be done. I have asked many questions, come into contact with many people, and I find that much of it goes back to the great leader of that time, Meiji Tenno. He must have been a very marvelous person, one who fulfills the psychologist's demand that one should be a complete individual, for he was not only a great statesman, but he could express his feelings in the form of poetry. I discovered what I thought was a charming poem of his, written in connection with the very beautiful river that flows past Izumo:

"Men call it Izumo,
 Whose gentle tide hath never ceased to flow
 Whose gentle bosom ne'er had been disturbed.
 Go to the beach and gather there a handful of
 smooth pebbles.
 If those few stones should grow into a moun-
 tain, scarred and steep,
 That sacred stream will never cease its soft
 perennial flow."

When a great statesman, carrying the burden of responsibilities of a nation, can turn aside from them and find recreation and joy in writing poetry, the problem is solved. It shows an evenly balanced nature, that no part of his being was allowed to starve and become undernourished, which is what the psychologists tell us is the trouble with most of us. We do not develop all four of our functions. If we are thinkers, we forget about feeling; if we are intuitionists, we forget the sensational side.

Therefore I thought I had found part of the answer why Japan has been able to accomplish the great undertaking she made less than seventy years ago. While Nikko is full of beauty, while the gardens in Kyoto are beyond comparison with any others in the world, while there are marvelous shrines and temples in many places, I must confess the Ginza has for me a perpetual interest. I have been as far as Matsushima and been thrilled by the beauty there, but it seems to me that it is in Tokyo that one sees fascinating things. The first thing which attracted me was the feet of the Japanese women. They walk so comfortably. Do not give up your nice, smooth, flat feet, for stupid high heels that so many of your charming flappers have chosen. They are throwing away the greatest comfort which life offers, because there is no woman in the United States who does not have an uncomfortable time with her feet.

Being a woman and a grandmother, I am rather more interested in the women of Japan than in any other aspect, but I find it is very difficult to get a close acquaintanceship with them. The younger ones are more responsive, and sometimes, in a shop, I have seen on the face of a

younger woman buying a dress, a look as if she were almost asking me to come and help her. Then I see the grave-looking mother with her glance at me, as much as to say: "Have I not warned you against these western women. They have no shame at all, and no pride. Just look at her hair, it is quite white." I was very impressed with the hair of the Japanese women, and the wonderful things they can do with it. It always looks so exactly right.

There is apparently no such thing as age in Japan except in a few cases. The charming mothers with their smiles, their sweetness, and their willingness, are wonderful to me. Where I have met a grandmother it seems to me there is not quite the same sweetness there but a rather disagreeable sound to the voice. They are perhaps bitter at being a sort of glorified baby pacifier, and if there is anything which seems frivolous to them it is to see a woman going about the world studying things with interest here and whose back proves she never carried a baby on it.

Being a woman, and a student of personal relationship, I believe I am going to take away from Japan the greatest possible stimulation. In this country, where customs and conditions are so well mapped out and planned, I, as a woman, know that there is nothing which requires as much courage as for a woman to take a stand which is unpopular, to invite unsympathetic criticism. I feel I must admit the depth of obligation I feel to one young Japanese woman who recently expressed her own individual interpretation of a very high ethical standpoint, the realization of her responsibility to succeeding generations, and who with such dignity returned to her natural protector. I feel that may prove to be a new change in the attitude of your women, and that they are moving towards the time when women live their own lives.

Viscount Inouye: After the very interesting speech of Mrs. Flower, I have to call upon Mr. Mason, a well-known

American journalist and the author of two books. He has been traveling extensively in Japan, Manchuria and Korea, and is going to speak to us of the Kami spirit of Izumo.

Mr. Mason: Like Mrs. Flower, I do not quite know why I was called upon to speak today on a subject which should be peculiarly a Japanese one, but Mr. Yomonomori insisted that I should, and as he is a descendant of the 47 Ronin, I have great respect and awe for him. When any descendant of the 47 Ronin tells me what to do, I do it. I would not like to create another scandal.

Mrs. Mason and I spent some little time in that far-distant part of your country where the Kami spirit prevails as an actual ordinary fact. This part of Japan is rather inclined to look at Izumo as a backward provincial center, but there is as much interest in modern progress in Izumo as here. There are beautiful cities, hot-spring resorts, clean streets, and every evidence of a desire for advancement. At the same time, to go to Izumo is like stepping back into the early chapters of history, and living with the spirit that has created your country and made it so great and powerful and competent to readjust itself to new conditions of life.

There is always a truth in every myth if you dig down far enough. Izumo is the land of truth of myths. There you are taken to a mountain and told that away back in early history the Koreans challenged the beauty of the Japanese mountains, so they moved one into Izumo for comparison. The Kami decided to increase its area, and so towed to Izumo a part of Korean territory, and they show you the rope. It is a peninsula of land like Ashinodakate. That is the myth, but the reality must be that at one time Izumo and Korea were much closer together, perhaps formed part of the same territory, that you were not always a group of islands, and that you belong to the mainland, and this knowledge has come down in the form of that myth.

Izumo has as priests of two of its principal shrines men who claim direct descent from the two great Kami of the Plain of High Heaven. At one shrine the chief priest is a descendant of the son of the person who carried to the Plain of High Heaven the sword got from the dragon's tail. On the 31st of December every year a priest goes into the mountain at the back of the shrine and there performs a secret ceremony. According to the villagers he symbolizes in ceremonial form by himself the passing of the sword from earth to heaven, done by his ancestor. There again the myth suggests relation between heaven and earth that is very real to many parts of Japan, an intuition primeval man has that we neglect in the west. To us heaven and earth are quite different. We claim to be the children of God, but put God at a distance. In Izumo there is no such distant relationship. The meeting of the claim of the priest that he is a descendant of the heavenly Kami is that the spirit itself, subjective in form, has come out into an objective world, and there is no difference of kind even if there may be of degree.

There is profound truth in another mythological form, which tells of a Kami visiting the deity of heaven so that Japan could become united. In that part of Japan in which the shrine of the Kami is situated, there was an independent government. The head decided it was in the best interests of his own part to bring about a union, and this was brought about without any conflict. I think this man should be regarded by the Japanese as one of the very greatest of your prehistoric personages. There must have been some individual in Izumo who was an organizer and director of affairs, and had enough vision to see that Japan must be a united country. So he consulted his own son, and the son is the Kami. Every year on the 7th of April they have a festival, the festival of the harbor, whereby the surrender of that part of your country to the whole of the country is empha-

sized through the heir apparent who agreed to it. After he agreed to it he sank below the waves. The heir apparent not only agreed to the consolidation of Japan, but removed himself so that there should be no later conspiracy to reestablish the dynasty.

While we were in Izumo it was the time for the gathering of all the Kami, between the 8th and 14th of November. The rest of your country is left to the living Kami. At each side of the shrine is a residence house for the Kami, two long narrow buildings with 19 small rooms in each, so that the myriads of Kami have to be put in 38 rooms. But as they are spirits there is no problem of overcrowding. The 19 rooms have doors that are closed, except during these five days, when the doors are open and white Shinto curtains are hung before them so that no one outside the buildings can see inside, because you do not want to destroy the symbolism by too much material realism.

That gathering of the Kami has been explained in many ways. The chief priest of the shrine there said that the pronunciation of the word October in ancient times might mean Kami-absent-month, or Kami-present-month. You know you sometimes see two Japanese men talking together, one looking very worried until the other does something with his finger in the air and then they reach an understanding. It is the same with this word. If you pronounce it in Chinese and translate it back into Japanese it is Kami-present-month. Perhaps of all the queer things in your country that is the queerest. So October, which far back in your history was a month for many Shinto festivals, is now a month without festivals. In Izumo October became the month for the presence of the Kami, and in the rest of Japan the month for the absence of the Kami.

Why is it that the rest of Japan accept this pronunciation of October to mean Kami absent month, while Izumo

takes it to mean Kami present month. Always there has been a spirit of freedom over there. Izumo is far removed from the political center of government, and perhaps when the order was given canceling all October festivals that order did not prevail to the fullest extent in Izumo. More than that, I think one may say the Kami are justified in paying special respect to the shrines of the man who consolidated Japan. You go to the other shrines in Izumo and it is almost like visiting a country of another time. To the school children we were objects of interest, and for the first time they learned to shake hands. At the Ise shrine, where there is no shrine building, but a rock which takes the place of the shrine, I met an old man smoking a pipe, and as I like a pipe myself I offered him a cigarette. He said he had seen though never smoked one. He took a pull and said it was Japanese tobacco. Although it was a Kohaku, a Turkish cigarette of Japanese make, he detected the perfume. Then I offered him a cigar. This he had never seen and did not know how to smoke. There, among the mountains in Izumo, where the people are kindly, cheerful or optimistic, in so many ways intensely progressive, yet they are delightfully simple, not primitive but primeval. Mrs. Flower wondered why it is that you have continued your development and have emerged as you have, readjusting yourself to the new conditions. One of the answers is to be found in Izumo. The fundamentals of the old humanity, so far back in history that no one knows the dates, can be retained, and on that old foundation can be built a new structure fully the equal in all progressive appliances to structures of the west and having in addition this charm of old humanity, this knowledge, this truth of a spiritual unification of man and God, a spiritual understanding that man is rather more than the child of God, that man is God come out into the world of matter. There at Izumo you find it. Going to the place where

Lafcadio Hearn first taught, one can understand why he wrote about Japan as he did. He was there in the very center of this living reality of old Japan, mingling with the new. His house, a beautiful house of seven rooms and two lovely gardens, he rented for the sum of three yen a month. The real price at the time was two and a half yen, but they charged him three because he was a foreigner. Now the house is occupied by the son of the man who rented it to

Hearn, and today the house rents for about 30 yen per month. That is within a space of forty-one years, and it rather shows how Izumo has come up in modern ways while holding fast to the old. I believe it should be a duty of every Japanese to make a journey to Izumo, not only to go to Ise to pay respects to the ancestors, but to go to Izumo to pay respects to the great Kami, who I believe was the first to bring about the unification of your country.

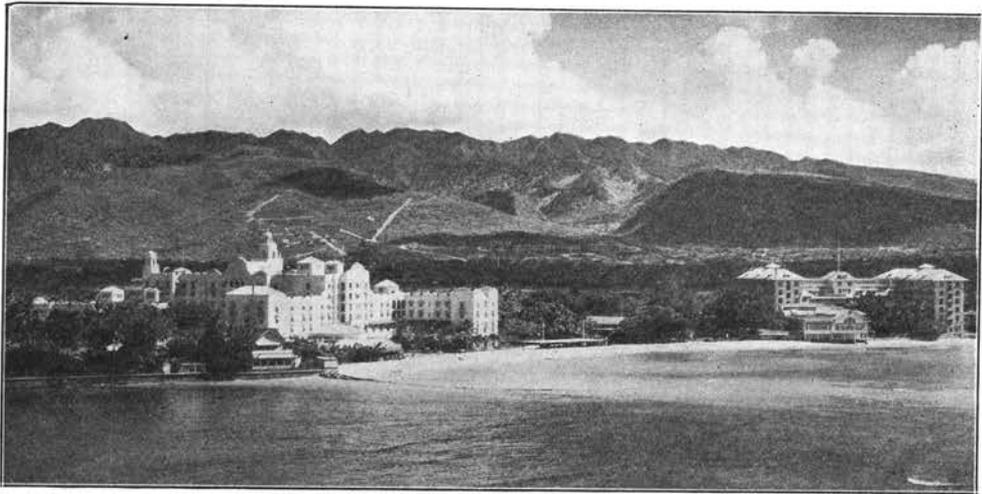
A National Film Institute in Britain

The proposed National Film Institute, after two years of investigation and inquiry, has been recommended by a voluntary commission. Its report handles the immense problem in a comprehensive way, and enthusiasts are not without hope that the institute (towards whose expenses are to be allocated 5 per cent of the Sunday cinema profits now devoted to charity) may do for the films what the British Broadcasting Corporation has done for wireless.

Potentially it is a powerful instrument of union between the self-governing Dominions, all of which offer film material of unrivalled quality. As for the colonial possessions of the Crown, the need for an efficient organization is sorely felt by administrators. The backward races within the Empire can indeed gain more and suffer more from the film than the sophisticated European, because to them the power of the visual medium is intensified. The conception of white civilization which they are receiving from third-rate melodrama is an international menace, yet the film is an agent of social education which could be as powerful for good as for harm. India is producing films which are as yet far from good, but which might become works of beauty, while many of her peasantry are as simple and illiterate as African tribes.

In more advanced countries with civilizations more comparable to our own some form of permanent central organization has in most cases been established. Japan vigilantly protects her youth against the influence of Western films, and compiles a national film library showing the history, the traditions and the social life of her people; in Italy, Signor Mussolini invites the Ministers of State to coöperate in the production and exhibition of films illustrating the greatness and destiny of Italy; the German Reich demands the exhibition of one German film for every foreign film shown, and has created an institute whose object is to improve the taste of the nation by the selection of the best films produced at home or abroad; France appoints within her Ministry of Fine Arts a permanent commission which "shall take into consideration the whole of the national interests involved, and more particularly the conservation of national customs and traditions;" America, Yale University produces films illustrating the great events of American history, and Harvard films recording the personalities and works of the leaders of American research.—(In the *Fiji Times* and *Herald*.)

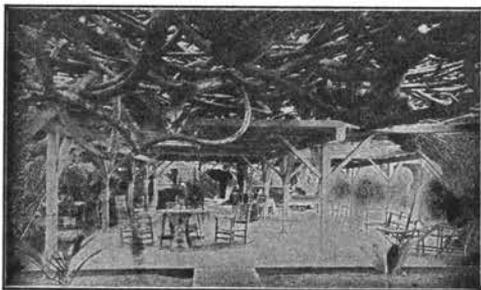
THE MID-PACIFIC



The Royal Hawaiian and the Moana-Seaside Hotels at Waikiki

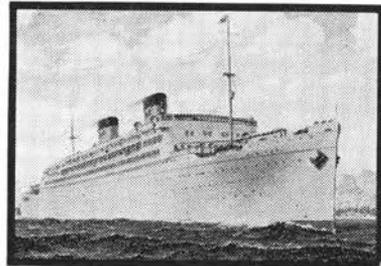
The Territorial Hotel Company, Ltd., own and operate the Royal Hawaiian Hotel, Moana-Seaside Hotel and Bungalows, and the Waialae Golf Club. The Royal Hawaiian has been voted the world's finest hotel by sixteen World Cruise Steamers. Rates upon application. Cable address Royalhotel.

The Matson-Lassco Steamship Company maintains a regular, fast, reliable passenger and freight service between Honolulu and San Francisco, Los Angeles, South Seas, Australia and Hilo. Castle & Cooke, Ltd. are local agents for the line, whose comfort, service and cuisine are noted among world travelers.

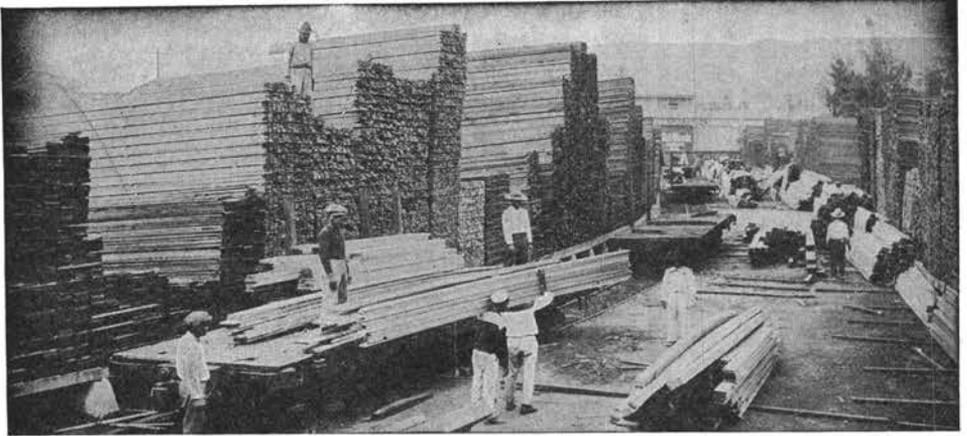


Famous Hau Tree Lanai

The Halekulani Hotel and Bungalows, 2199 Kalia Road, "on the Beach at Waikiki." Includes Jack London's Lanai and House Without a Key. Rates from \$5.00 per day to \$140.00 per month and up. American plan. Clifford Kimball, owner and manager.



The von Hamm-Young Co., Ltd., Importers, Machinery Merchants, and leading automobile dealers, have their offices and store in the Alexander Young Building, at the corner of King and Bishop streets, and their magnificent automobile salesroom and garage just in the rear, facing on Alakea Street. Here one may find almost anything. Phone No. 6141.

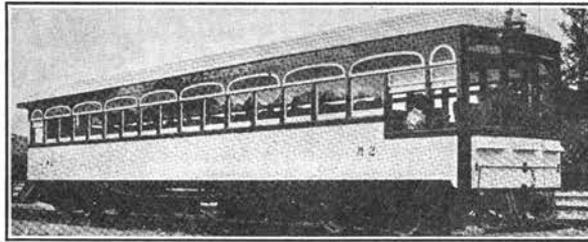


One of the Lewers & Cooke, Ltd., Lumber Yards

Lewers & Cooke, Ltd., have, since 1852, been headquarters for all varieties of building material, lumber, hollow tile, cement, brick, glass, hardwoods and oak flooring; as well as tools of the leading manufacturers, wall papers, Armstrong linoleums, domestic and oriental rugs, W. P. Fuller & Company's superior paints and Sargent Hardware.

They are also agents for Celotex cane-fibre products, Blue Diamond Stucco, cement colors, corrugated steel sheets, Lupton's metal windows, Gladding McBean's brick, roof and floor tile, and Pabco prepared roofings. A Home Building Department is maintained to help small home builders, and a Home Service Department to assist home owners in re-decorating and modernizing.

OAHU RAILWAY AND LAND COMPANY



Leaving Honolulu daily at 9:15 A. M. our modern gasoline motor cars take you on a beautiful trip around the leeward side of Oahu to Haleiwa.

The train leaves Haleiwa, returning to Honolulu at 2:52 P. M., after having

given you three hours for luncheon and sightseeing at this most beautiful spot.

You arrive at Honolulu at 5:27 P. M.

No single trip could offer more, and the round trip fare is only \$2.45.

SEE OAHU BY RAIL

ADVT.



The Home Building in Honolulu of the American Factors, Ltd., Plantation Agents and Wholesale Merchants



Tasseled sugar cane almost ready for the cutting and crushing at the mills.

ADVT.



Home of Alexander & Baldwin, Ltd.

Anyone who has ever visited the Hawaiian Islands can testify to the usefulness of the "A & B Steamer Calendars" which are to be seen on the walls of practically every office and home in Hawaii. The issuing of and the free distribution of these calendars is a distinct public service rendered for some 30 years by Alexander & Baldwin, Ltd., who are staunch supporters of all movements that work for the good of Hawaii.

The beautiful new office building pictured above was erected recently as a monument to the memory of H. P. Baldwin and S. Alexander, the founders of the firm and pioneers in the sugar business.

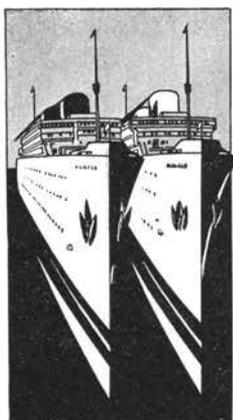
Alexander & Baldwin, Ltd., are agents for some of the largest sugar plantations on the Islands; namely, Hawaiian Commercial & Sugar Co., Ltd.; Hawaiian Sugar Co.; Kahuku Plantation Company; Maui Agricultural Company, Ltd.; McBryde Sugar Company, Ltd.; Laie Plantation; and also Kauai Pineapple Co.,

▲ADVT.

Ltd.; Baldwin Packers, Ltd.; The Matson Navigation Co. at Port Allen, Kahului, Seattle and Portland; and the following-named and well-known insurance companies: Union Insurance Society of Canton, Ltd.; The Home Insurance Company, New York; Springfield Fire & Marine Insurance Co.; New Zealand Insurance Company, Limited; The Commonwealth Insurance Company; Newark Fire Insurance Company; American Alliance Insurance Association; Queensland Insurance Co., Ltd.; Globe Indemnity Company of New York; Switzerland General Insurance Co., Ltd.; St. Paul Fire and Marine Ins. Co.

The officers of Alexander & Baldwin, Ltd., are: W. M. Alexander, Chairman Board of Directors; J. Waterhouse, President; H. A. Baldwin, Vice-President; C. R. Hemenway, Vice-President; J. P. Cooke, Treasurer; D. L. Oleson, Secretary; J. F. Morgan, Asst. Treasurer; J. W. Speyer, Asst. Treasurer.

CASTLE & COOKE



BREMEN^{OR} MALOLO BERLIN^{OR} MANHATTAN

Wherever you travel . . . whichever route you prefer . . . Castle & Cooke's Travel Bureau will arrange your reservations or accommodations and relieve you of all annoying detail. Information, rates, or suggestions are offered without obligation and you are invited to use the travel files and service of the bureau. **Castle & Cooke Travel Bureau**, Merchant St., at Bishop. Branches in Royal Hawaiian and Moana Hotels.

C. BREWER AND COMPANY, LIMITED



C. Brewer and Company, Limited, Honolulu, with a capital stock of \$8,000,000, was established in 1826. It represents the following Sugar Plantations: Hilo Sugar Company, Onomea Sugar Company, Honomu Sugar Company, Wailuku Sugar Company, Pepeekeo Sugar Company, Waimanalo Sugar Company, Hakalau Plantation Company, Honolulu Plantation Company, Hawaiian Agricultural Company, Kilauea Sugar Plantation Company, Paauhau Sugar Plantation Company, Hutchinson Sugar Plantation Company, as well as the Baldwin Locomotive Works, Kapapala Ranch, and all kinds of insurance.

ADVT.



The Honolulu Construction & Draying Co., Ltd., Bishop and Halekauwila Sts., Phone 4981, dealers in crushed stone, cement, cement pipe, brick, stone tile, and explosives, have the largest and best equipped draying and storage company in the Islands, and are prepared to handle anything from the smallest package to pieces weighing up to forty tons.

The Hawaiian Electric Co., Ltd., with a power station generating capacity of 32,000 K.W., furnishes lighting and power service to Honolulu and to the entire island of Oahu. It also maintains its cold storage and ice-making plant, supplying the city with ice for home consumption. The firm acts as electrical contractors, cold storage, warehousemen and deals in all kinds of electrical supplies, completely wiring and equipping buildings and private residences. Its splendid new offices facing the civic center are now completed and form one of the architectural ornaments to the city.

The City Transfer Company, at Pier 11, has its motor trucks meet all incoming steamers and it gathers baggage from every part of the city for delivery to the outgoing steamers. This company receives, and puts in storage until needed, excess baggage of visitors to Honolulu and finds many ways to serve its patrons.

ADVT.

The Pacific Engineering Company, Ltd., construction engineers and general contractors, is splendidly equipped to handle all types of building construction, and execute building projects in minimum time and to the utmost satisfaction of the owner. The main offices are in the Yokohama Specie Bank Building, with its mill and factory at South Street. Many of the leading business buildings in Honolulu have been constructed under the direction of the Pacific Engineering Company.

The Universal Motor Co., Ltd., with spacious new buildings at 444 S. Beretania street, Phone 2397, is agent for the Ford car. All spare parts are kept in stock and statements of cost of repairs and replacements are given in advance so that you know just what the amount will be. The Ford is in a class by itself. The most economical and least expensive motor car in the world.

Honolulu as Advertised



The Liberty House, Hawaii's pioneer dry goods store, established in 1850; it has grown apace with the times until today it is an institution of service rivaling the most progressive mainland establishments in the matter of its merchandising policies and business efficiency.

The Waterhouse Co., Ltd., in the Alexander Young Building, on Bishop street, make office equipment their specialty, being the sole distributor for the National Cash Register Co., the Burroughs Adding Machine, the Art Metal Construction Co., the York Safe and Lock Company and the Underwood Typewriter Co. They carry in stock all kinds of steel desks and other equipment for the office, so that one might at a day's notice furnish his office, safe against fire and all kinds of insects.

The Honolulu Star-Bulletin, 125 Merchant Street, prints in its job department the Mid-Pacific Magazine, and that speaks for itself. The Honolulu Star-Bulletin, Ltd., conducts a complete commercial printing plant, where all the details of printing manufacture are performed. It issues Hawaii's leading evening newspaper and publishes many elaborate editions of books.

ADVT.

The Honolulu Dairymen's Association supplies the pure milk used for children and adults in Honolulu. It also supplies the city with ice cream for desserts. Its main office is in the Purity Inn at Beretania and Keeaumoku streets. The milk of the Honolulu Dairymen's Association is pure, it is rich, and it is pasteurized. The Association has had the experience of more than a generation, and it has called upon science in perfecting its plant and its methods of handling milk and delivering it in sealed bottles to its customers.

Stevedoring in Honolulu is attended to by the firm of McCabe, Hamilton and Renny Co., Ltd., 20 South Queen Street. Men of almost every Pacific race are employed by this firm, and the men of each race seem fitted for some particular part of the work, so that quick and efficient is the loading and unloading of vessels in Honolulu.

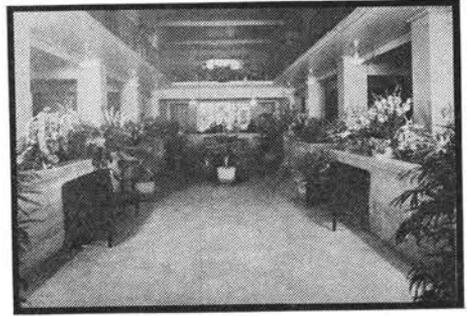
Twice a week the **Inter-Island Steam Navigation Company** dispatches its palatial steamers, "Waialeale" and "Hualalai," to Hilo, leaving Honolulu at 4 P.M. on Tuesdays and Fridays, arriving at Hilo at 8 A.M. the next morning. From Honolulu, the Inter-Island Company dispatches almost daily excellent passenger vessels to the island of Maui and twice a week to the island of Kauai. There is no finer cruise in all the world than a visit to all of the Hawaiian Islands on the steamers of the Inter-Island Steam Navigation Company. The head offices in Honolulu are on Fort at Merchant Street, where every information is available, or books on the different islands are sent on request. Tours of all the islands are arranged.

Connected with the Inter-Island Steam Navigation Company is the world-famous Volcano House overlooking the everlasting house of fire, as the crater of Halemaumau is justly named. A night's ride from Honolulu and an hour by automobile, and you are at the Volcano House in the Hawaii National Park on the Island of Hawaii, the only truly historic caravansary of the Hawaiian Islands.

There are other excellent hotels on the Island of Hawaii, the largest of the group, including the recently constructed Kona Inn, located at Kailua on the Kona Coast—the most primitive and historic district in Hawaii.

The Bank of Hawaii, Limited, incorporated in 1897, has reflected the solid, substantial growth of the islands since the period of annexation to the United States. Over this period its resources have grown to be the largest of any financial institution in the islands. In 1899 a savings department was added to its other banking facilities. Its home business office is at the corner of Bishop and King streets, and it maintains branches on the islands of Hawaii, Kauai, Maui, and Oahu, enabling it to give to the public an extremely efficient Banking Service.

ADVT.



Interior View of Bishop Trust Co.

The Bishop Trust Co., Limited, largest Trust Company in Hawaii, is located at the corner of Bishop and King Streets. It offers Honolulu residents as well as mainland visitors the most complete trust service obtainable in the islands today. The Company owns the Guardian Trust Co., Pacific Trust, Waterhouse Trust, and the Bishop Insurance Agency, and is thus able to offer an all-inclusive service embracing the following: Trusts, Wills, Real Estate, Property Management, Home Rental Service, Stocks and Bonds and the Largest Safe Deposit Vaults in Hawaii.

Honolulu Paper Company, Honolulu's leading book and stationery store, is located on the ground floor of the Young Hotel Building in the heart of Honolulu's business district. The company has a complete stock of all the latest fiction, travel, biography and books relating to Hawaii. It is also distributor for Royal Typewriters, Adding Machines, Calculators and steel office furniture.

The Haleakala Ranch Company, with head offices at Makawao, on the Island of Maui, is as its name indicates, a cattle ranch on the slopes of the great mountain of Haleakala, rising 10,000 feet above the sea. This ranch breeds pure Hereford cattle and is looking to a future when it will supply fine bred cattle to the markets and breeders in Hawaii.



KING OF FRUITS