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Agricultural Education in American Samoa

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A Thesis

Presented to the Graduate Division of the

University of Hawaii

in Partial Fulfillment

of the Requirements for the Degree

Master of Education

August 1936

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PREFACE

During two years residence in American Samoa as Superintendent of Education the writer became greatly interested in agricultural education there. In thirty-five years the population of American Samoa has more than doubled. Will this same increase hold true for the future? If so, what is to be done about the food and money needed? What changes will have to be made in agriculture? Who will make these changes? Agriculture in the past has been very simple because of Nature's many kindnesses. This is also true of the agriculture of the present. It is in the agriculture of the future that the Samoan and the authorities will need help. It is hoped that this thesis will give needed assistance.

A changed agriculture is necessary. In order to produce food for a rapidly increasing population on a definite area of land which is not especially fertile, many changes will have to be made. These changes will have to be made by the Samoan but that will only come as the authorities encourage him with critical understanding. In other words education is necessary to cause the Samoan to make the change himself. It will take longer than a process of forced change but it will have a more lasting effect. At any rate, the change has to be made if Samoa is to become a self-sufficient country in the future. This thesis is a study of agricultural education in American Samoa in terms of needed changes.

The study made is by no means exhaustive of all tropical crops grown but does take up all crops that have a direct bearing on the Samoan himself. All islands of American Samoa except Swains Island and Rose Island are included.

The writer is indebted to many persons both in Samoa and outside for help. Special mention must be made of the great interest and wholehearted cooperation of Captain O. C. Dowling, U.S.N., Governor of American Samoa from April, 1934 to January, 1936. Thanks are also due to Captain M. Milne, U.S.N., the present governor of American Samoa for his help in gathering the material on income and expenditures. He made it possible for the writer to have access to all official records. All department heads were very cooperative in furnishing needed information bearing on the problem. Commander T. L. Kirkpatrick (Ch.C) U.S.N., Director of Education, and Lieutenant-Commander Sailor U.S.N., Attorney General, are due special thanks, Commander Kirkpatrick for his sincere friendship and the use of most of the pictures in Appendix C., and Lieutenant-Commander Sailor for his valuable help in furnishing so much material from his department. Many others are due thanks for their help in clarifying the characteristics of the Samoans. These are, Brother Fred Henry, S. Fa'amausili, Gustav Hannemann, B. F. Kneubuhl, H. F. McMullin, Tufele, and High Talking Chief Pele.

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CHAPTER I
STATEMENT OF PROBLEM

1. Present Conception of Agriculture.

Agriculture in American Samoa is in much the same state as it was when the United States first came into the Islands. The land is not used any more efficiently, the present crops are the same, the same amount of labor, and possibly less, is expended in producing these crops: in short, agriculture as such is exactly where it was thirty-five years ago. It is something that has to be done in order to live, and when sufficient food is produced to maintain life with a very few additional necessities, other, more amusing things should be done.¹

More land has been put under cultivation due to the increased population of the Islands which was 5,679 in 1900² and 11,466 on December 31, 1935.³ This increase represents a little better than one hundred per cent. New land has been reclaimed from the bush to produce food for this increase rather than a greater return per acre cultivated. A few minor tools have been adopted from the Western civilization; such as the bush knife for general agricultural work and the axe for rough clearing and lumber felling. The oso,

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1. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930). 544.
 2. U. S. Naval Census.
 3. U. S. Naval Census.

a pointed stick, is still used as of old, and this in conjunction with the bush knife forms practically all the agricultural tools in general use.⁴

The Samoan village life is headed up by a group of matai, or chiefs, each one the head of his family group. He is chosen by the family group itself in conference where a selection is made. These matai meet at intervals to discuss matters dealing with the village welfare. Where the cooperative efforts of groups are required for the village welfare,⁵ the aumaga, or untitled men, are called upon. These are the individual members of families represented by the matai.

The matai is elected by the family to look after its interests in the village fono, or gathering of chiefs. He also handles the division of the family lands, production and division of food, care of the sick, and the financial income and expenditures for the family. The aumaga do the main work of heavy labor under the direction of the matai, practically all of the cooking and serving the superior, or matai. The matai at times joins the aumaga in the heavy labor,⁶ but this is rather unusual as he is kept fairly busy in ceremonial activities, weaving sennit as he sits in conference, a little fishing, a little house building, and much resting.

4. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 545, 546.

5. Keesing, Modern Samoa, 292

6. Ibid.

The Samoan gains prestige and authority by the giving of wealth rather than its accumulation.⁷ This is often done to impress visitors, governmental officials or the church. Even if pauperized, following such a feast or presentation of gifts, it is thought of as wealth well spent as prestige, or "face" is the main thing in life. Therefore, a matai ordinarily spends much time planning or executing some move to increase his prestige. Because this is done, many of his family group are busy helping him with a consequent loss in agricultural efficiency.

A wedding or a death in a family means a gathering of the family and friends which is always followed by an elaborate feast prepared by the family itself.⁸ These activities take up a great deal of the time of the family members which otherwise would be spent in producing food for the use of the family or in the production of copra for sale. A wedding or death at a later date in some other family will mean somewhat of a partial return in food to the first family but the great loss in time is never made up. In addition to the feasts already mentioned there are also those following a birth in the family and in the selection of an individual for a certain title when he becomes a matai.⁹

There are several groups in American Samoa that receive financial returns which might be called salaries or wages. These will be found listed in Table I on page 5. In

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- 7. Keesing, Modern Samoa, 292
 - 8. Keesing, Modern Samoa, 294
 - 9. Keesing, Modern Samoa, 294

addition, other sources of income in American Samoa going directly into the hands of the native Samoans themselves are given to picture the income for the year. These figures are for the year 1935. Only native Samoans are listed in this table as it gives a picture of what they have to use. There are several other sources of income in American Samoa, such as the salaries of the white naval personnel; but these are not listed as the amount that remains from these in Samoa is insignificant. This table is given because it has a direct bearing upon the problem of agriculture in American Samoa.

The Fita Fita Guard are native Samoans who have been enlisted in the navy for duty in Samoa only. They receive the same pay as the American sailor wherever he may enlist. In addition to this pay, the active Fita Fita members are granted the privilege of purchasing at the U. S. Naval Commissary Store. The retired members may purchase there, but only upon paying an additional 15 per cent customs duty. All other natives in Samoa must make their purchases at the commercial stores in the Islands where a 15 per cent customs duty is added on to the regular selling price.

Of the staff of sixty-two in the Department of Education fifty-five are native Samoans. In addition to the salaries listed, the teachers receive native food which is furnished by the village where they are teaching.

The individuals working in the laundry, the supply department, public works, and customs departments receive salaries listed without any other remuneration. The

TABLE I. NATIVE SAMOAN INCOME FOR 1935.

Number	Income/Year
80 Active Fita Fita Guard members	\$ 43,276.08 (10)
43 Reserve and retired Fitas	36,111.20 (10)
55 Native Samoan Teachers	11,304.55 (11)
10 Laundry employees	1,874.25 (12)
21 Supply Department employees	12,455.97 (13)
14 Graduate Nurses	3,797.51 (14)
38 Student Nurses in training	1,821.45 (14)
1 Special Nurse	144.00 (14)
7 Samoan Males in Medical Department	4,446.00 (14)
95 Public Works employees	60,249.71 (15)
21 Customs Department employees	11,379.85 (16)
40 Personal and House servants	5,460.00 (17)
3 District Governors	1,800.00 (18)
14 County Chiefs	2,106.00 (18)
48 Pulenu'us	2,460.00 (18)
6 District Judges	1,110.00 (18)
6 District Court Clerks	576.00 (18)
33 Village Magistrates	3,168.00 (18)
14 County Chief Policemen	708.00 (18)
33 Village Clerks	1,188.00 (18)
48 Village Policemen	1,230.00 (18)
10 (5) Clerks in Attorney General's office and 5 Copra Clerks	4,062.00 (18)
640	\$210,728.57
Curios etc. sold on the malae(boat days)	\$ 9,600.00 (19)
Department of Native Industries	14,400.00 (20)
Sale of foodstuffs to Caucasians	600.00 (21)
Delegates' income to Annual Fono	90.00 (18)
Income-3 Samoan members-Audit Board	180.00 (18)
Income for Feleti School Lease	180.00 (18)
Income for Landenberger Farm School Lease	120.00 (18)
Income to Aunu'u village for copra freight	123.08 (18)
Income to Fagaitua village for copra freight	35.60 (18)
Copra Income (1554 Tons, 1919 lbs @ \$1.40 per 100 pounds)	50,198.54 (18)
Grand Total	\$286,255.79

10. Information by Capt. of the Yard, Naval Station, Tutuila.
11. Information by Dept. of Education, Island Government. Tutuila.
12. Information by Laundry Officer, Naval Station, Tutuila.
13. Information by Supply Officer, Naval Station, Tutuila.
14. Information by Chief Medical Officer, Naval Station, Tutuila.
15. Information by Public Works Officer, Naval Station, Tutuila.
16. Information by Customs Officer, Naval Station, Tutuila.
17. Estimate arrived at after talking to inhabitants.
18. Information by Attorney General, Naval Station, Tutuila.
19. Estimate made by U. S. Navy, Naval Station, Tutuila.
20. Estimate by Ex-Governor O. C. Dowling.
21. Estimate arrived at after talking to inhabitants.

graduate nurses are stationed here and there throughout the Islands at dispensaries. They are furnished food much the same as the teachers.

The District Governors, County Chiefs, Pulenu'u, Judges, Clerks and Policemen receive certain salaries per month as listed. They are the individuals chosen by the Island Government with the aid of the local populace to administer government in American Samoa. Inasmuch as this is not a treatise on government it is not felt necessary to go into the details of the duties of each of these individuals. Suffice is it to say that on the whole the local government functions rather smoothly.²²

A few further words need be said regarding the judicial system. American Samoa is divided into six judicial districts. Each district is presided over by a District Judge with the exception of District Number One where the American Judge also sits. The Clerk of the District Courts 2, 3, 4, 5, and 6 do not receive a salary but get forty per cent of the fines and court costs that are collected, not to exceed \$15.00 in any one month. Therefore, their salaries in Table I are estimated.

Village Magistrates receive forty per cent of all fines and costs collected not to exceed \$8.00 a month and the Clerks receive thirty per cent not to exceed \$5.00 a month. They do not receive a monthly salary. Therefore, their salaries in Table I are also estimated.

22. Keesing, Modern Samoa, 204, 205

Other sources of income for the people of American Samoa are from the copra crop, sales of mats, tapas and curios to tourists and some foodstuffs to the Caucasian personnel. More will be said later about copra production over a period of years. For the past year the income from this source was \$50,198.54. Each month, two steamers call at Pago Pago and from a check made from time to time it is estimated there is sold \$400.00 worth of mats and curios per steamer. In 1933 there was organized a Department of Native Industries in order to promote the sale of mats and curios in other localities. This department has thrived and at the present time it is estimated that there is an income of \$1200.00 per month.²³ The sale of foodstuffs to the white personnel of the Islands is estimated at \$50.00 per month.

The figures in Table I represent actual money going directly into the hands of the native Samoans themselves. This does not represent the other sources of revenue to the Island Government such as customs duties, harbor fees, transportation profits and others that are used to maintain the government itself. As given in Table I the total for all incomes is \$286,255.79. This represents an annual income per individual of \$24.96 for 1935.

In Table II on page 9 will be found the Expenditures of the American Samoans.

All physically fit males over 18 years of age must pay a tax of \$9.00 per year. For the year 1935 this group

23. Estimate made by Capt. O. C. Dowling, Ex-Governor of American Samoa.

totaled 2291 representing an amount of \$19,062.00 as 183 persons were delinquents.²⁴

About 85 per cent of the Samoan people belong to the London Missionary Society Church. Each individual who partakes of the Lord's Supper pays \$1.50 per year as church dues. Except for a two months' period during the year a collection is made the first Sunday of the month for the benefit of the Pastor or Faifeau. This collection is solely cash. A deacon of the church calls off the names of the individual members and they pledge their contribution. The names of unmarried males are not called because they are expected to swell the contribution of their matai who arranges beforehand as to what this amount will be. Every individual called pledges some amount because not to give means an entire loss of "face." This pledge is made once a month for ten months and never less than twenty-five cents is given and usually it is fifty cents. If forty cents is taken as an average this represents an expenditure of four dollars per year.

Also on some other Sunday of each month a taulaga or collection for foreign missions and missionaries is made. This averages much less than the collection for the pastor but is done in the same way. Taking an average here of twenty cents represents a total expenditure of two dollars for the year. In addition to all of this, members are more or less expected to make presents of canned foods, shirts,

24. Information furnished by Attorney General, U. S. Naval Station, Tutuila, Samoa.

TABLE II. EXPENDITURES OF AMERICAN SAMOANS FOR 1935.

Taxes--2118 individuals @ \$9.00	\$ 19,062.00 (25)
Church Dues--L. M. S.--3370 members @ \$1.50	5,655.00 (26)
Pastor Collections--L. M. S.--1950 people @ \$4.00	7,800.00 (26)
Pastor Presents--L. M. S.--1950 people @ \$1.00	1,950.00 (26)
Other Denominations--700 members @ \$8.00	5,600.00 (27)
Women's Clothes--3100 females over 18 years of age @ \$9.00	27,900.00 (28)
Men's Clothes--3400 males over 18 years of age @ \$10.00	34,000.00 (29)
Children's Clothes--1370 children from 10 to 18 years @ \$4.00	5,480.00 (30)
Imported Foods	69,373.00 (31)
Traveling	22,932.00 (32)
Church Buildings	2,500.00 (33)
Total	\$202,252.00

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25. Figures furnished by Attorney General, U. S. Naval Station.
26. Estimated from Church Membership. Church Officials do not know exact amounts.
27. Ibid.
28. Estimate based on imported cloth. Imports furnished by Customs Officer, U. S. Naval Station.
29. Ibid.
30. Ibid.
31. Import figures furnished by Customs Officer, U. S. Naval Station.
32. Estimate based on travel permits issued by Attorney General.
33. Estimate by Public Works Officer, U. S. Naval Station, Tutuila.

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lavalavas to the pastors. This would probably represent a total of one dollar per year per individual.

The other denominations represented do not have such a system but voluntary contributions are made except the Mormons who are expected to tithe. With all of these church members an annual expenditure of probably eight dollars is made per individual member.

Clothes are usually a necessary expenditure for any people and it has become so in American Samoa. The apparel previously worn was made entirely at home from native materials without actual cash outlay but at the present time this is very much the exception.³⁴ The old costume is being worn by only one individual except on ceremonial occasions. Even this individual has ample cotton clothes at home. The usual costume worn by the women is a Mother Hubbard type of dress hanging over a lavalava. This dress hangs to the waist or a little lower. The average woman's wardrobe has about eight of these outfits and an average of six must be obtained during the year.³⁵ This represents an expenditure of about \$9.00 per year at the current prices of cotton bolting at the stores. The men ordinarily wear a lavalava, an undershirt and shorts. About eight of these outfits are used per year with an expenditure of about \$8.00.³⁶ In addition

34. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 249

35. Estimate arrived at after talking to 15 women.

36. Estimate arrived at after talking to 20 men.

to this all school teachers, pastors, and clerks have white shirts which represent an expenditure of at least seventy-five cents per shirt. All married men and many others feel it necessary to have a coat of some description for church and at gatherings where they meet with the white man such as the Annual Fono, Inauguration of Governors and Flag Day. This increases the total to \$10.00.

Ordinarily boys and girls wear out many more outfits than their parents, a fair estimate being about 10 per year.³⁷ However, as much of these outfits are made-overs from parents clothing, there is only a possible cash outlay of 5 outfits per year. This means about \$4.00 each for boys and girls from 10 years of age to 18. Younger children do on made-overs because most of the time they are made at least up until the time they are five or six years of age. This is certainly true for those living away from the bay area.

Food and shelter are two more necessities in most parts of the world but in American Samoa all necessary food can be raised on the plantation and consequently there is no necessity to buy it. More will be said regarding this below, under luxuries. In the case of shelter all materials used are produced locally, and in most instances no cash outlay is necessary. The native carpenters are paid for their labor with local food while making a house or

37. Estimate arrived at after talking to 15 parents.

fale, and fine mats upon its completion. Therefore it will be seen that these two categories in American Samoa do not enter in as cash outlays.

There are several expenditures made that can be classed as luxuries. The largest one is food. As explained previously the Samoan produces all the needed food that he uses if he wishes. But more and more he has become acquainted with imported food products such as sugar, rice, flour, canned salmon, canned beef, and sardines so that at the present time he uses a good deal of these products in his daily diet.³⁸ This does not mean that he does not use his own foods, but rather that he has adopted the new in order to add to the old diet. Canned salmon, sardines, sugar and canned beef are the preferred imported foods.

Other things purchased at the stores are articles of personal adornment such as jewelry and neckties. The Samoan is allowed to have beer but nothing stronger.³⁹ More and more beer is consumed, and this will become an ever increasing item as the years pass. Below is given a list of imports into American Samoa for the past seven years. These imports consist of flour, rice, meat, soap, biscuits, sugar, drapery, cotton goods, matches, tobacco, bags, suitcases, drugs, and beer.

38. Conclusion based on import figures and observation.

39. Ruling by the Governor of American Samoa.

<u>Year</u>	<u>Total</u>
1927-28	167,064
1928-29	172,465
1929-30	146,534
1930-31	147,815
1931-32	127,858
1932-33	131,242
1933-34	114,835
1934	125,271
1935	136,753 (40)

These imports are exclusive of the Naval Station so that practically all materials were used by the natives themselves. Deducting the total allowed previously for women's, men's, and children's clothes of \$67,380 from the figures for the last two years we have the following figures which represent the expenditure principally for imported foods and luxuries.

1934	\$ 57,891
1935	69,373

Other expenditures classed as luxuries would be malagas or trips and church buildings. A Samoan loves to travel or visit new scenes and especially the center of his universe, Pago Pago. People living in areas near the bus lines ride these to the U. S. Naval Station. Others travel to the station by trail or rowing boats. If a Samoan lives in Manua he can get to Pago Pago on board the motor boat Tutuila on which a charge of \$2.00 per person is made.⁴¹ Passage to Apia, Western Samoa, is also obtained on the "Tutuila" on which a charge of \$7.50 per person each way is made.⁴² So much

40. Information furnished by Customs Officer, Naval Station

41. Current fare between Manua and Tutuila

42. Current fare between Apia and Tutuila

traveling is done that a fair yearly estimate of expense per individual in American Samoa would be \$2.00. For a population of 11,466 this figure then becomes \$22,932.00.

Samoa has become known rather facetiously as the land of "unfinished churches." However, there is a great deal of truth to this statement if one considers that there is great competition between villages in the size and appearance of their churches. A village may complete a new church building one year and the adjoining village will erect a larger and more ornate one the next year. It then becomes the ambition of the first village to outdo the second in this line and all efforts are bent toward that end until it is accomplished. The old church building is allowed to deteriorate giving the appearance of never having been completed, which is not the actual truth. If these buildings were entirely native in their construction, they would not become such a burden on the people, but within the last two decades the desire has become paramount to construct concrete buildings of American style architecture. An example of this is the case of Vaitogi which has just completed such a building at a cost of about \$7500.00.⁴³ It cannot be said that one such building is constructed yearly in American Samoa, but a safe estimate would be one such every three years. This means then an additional yearly expenditure for the group of about \$2500.00.

2. Past Attempts to Foster Agriculture.

43. Figure furnished by the Public Works Officer. Naval Station.

From the first, authorities of American Samoa have tried to encourage the natives to produce more copra by better cultivation and general care and also to improve their livestock which is very poor.⁴⁴ Visitors from time to time have also urged improvement by word and in writing in the O Le Fa'atonu,⁴⁵ the monthly government newspaper.

Very little of anything constructive was done, such as demonstrations of good farming, and the importation of breeding stock. However, native officials were expected to encourage the better care of the coconut and copra; in fact, it was one of their duties.⁴⁶ One result through the years has been the marketing of the entire copra crop by the Government.⁴⁷ In this way a much better selling price has resulted, being more than double the price received by the Western Samoans. The Samoan as mentioned previously has taken to cultivating more land, but this is due to the increased population and the necessity for food. Otherwise he has been very apathetic to any improvements in methods and stock or increase in acreage of copra which has been and still is his only cash crop. This can be illustrated

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44. Annual report of every Governor of American Samoa.
 "War on Rats in Manua", O Le Fa'atonu, December, 1915
 "The Coconut Beetle in American Samoa", Ibid, Dec., 1922
 "The Rat", Ibid, January 1923
 "The Coconut Beetle", Ibid, February-March, 1923
 "Chicken Raising in American Samoa", Ibid, Jan.-Feb., 1925
 45. Wilder, G. F., "The Coconut and Coconut Beetle", Ibid,
 September, 1923
 46. Keesing, Modern Samoa, 338
 47. Ibid.

best by taking the production figures of 1905 when 1146.13 tons were produced at \$57.50 per ton and 1925⁴⁸ when 1314.87 tons were produced at \$106.00 per ton. Production has moved up and down, fluctuating with weather, hurricane, and other conditioning factors, until the year 1928. Then there was a decided spurt for three years when the production gained tremendously. After 1930 there was a drop, especially noticeable in 1933 and 1934. When prices are low there is very little production.

In 1930 Dr. Fullaway of Honolulu went to American Samoa to report on the agricultural conditions. As reported by then Governor G. S. Lincoln at the Annual Fono of 1930 Dr. Fullaway stated that

"What was most needed for increased production was more work; that the coconut plantations were handled very badly; that plantations were overgrown with weeds, and coconuts are lying on the ground ungathered; that it is generally admitted that not more than one-fourth of the crop is harvested. He states that the poor production is not altogether from lack of knowledge and intelligence, but because the people do not work." (49)

Past attempts to foster agriculture can be said to have resulted in nothing. By talk, and writing and leaving further activity to the Samoan himself it is to be seen that nothing was accomplished.

48. Figures obtained from the Attorney General, Naval Station, Tutuila.

49. O Le Fa'atonu, November, 1930.

3. Present Attempts to Foster Agriculture.

By present is meant from 1932 to the present year. This time is taken because in October, 1932 Governor Landenberger organized the Department of Agriculture with the radio officer, J. J. Alexander as Aide for Agriculture. This was done because Alexander was interested in farming. The prospectus of this department can be best described by quoting from the annual report of the Aide for Agriculture, Mr. J. J. Alexander as of June 30, 1934.

"The Department of Agriculture was organized in October, 1932 for the purpose of introducing new trees and field crops, additional root crops and useful hardwood trees. Also intended to bring about an improvement in quality of fruits and other plants already growing here and increase the copra output by introduction of better methods of handling and improving conditions of the plantations. The basic plan included establishment of school plantations that Samoan children might be taught something of agriculture and that a definite planting program for the various villages could be formulated." (50)

A site was selected adjacent to Taputimu Experiment Farm for an Agricultural School. A lease was arranged for twenty years from April 2, 1934. It was named Landenberger Agriculture School. Students were to be selected during the following year. The students were to be given practical farm experience under the guidance of a foreman and were to live at the school. A period of a

50. Annual Report of the Department of Agriculture to the governor by J. J. Alexander, Aide for Agriculture, June. 1934.

year was to be spent here by students before going home to their villages. These students were to come from all districts of the group and to be selected through the Department of Education. A building of lime mortar previously used by the pastor of Vailoa was on the property and was to be used to house the foreman and students.

About eight boys were finally rounded up during July, 1934 and started their training at the school. To start with, this training was in the nature of working on the Experimental Farm without classwork and without the supervision of anyone except the farm foreman who was not an agriculturist in any sense of the word. Inadequate preparations for food were made at the beginning and with this handicap plus opposition of boys and adults to attending a school for hard work rather than classwork it was only a question of about two weeks when all the boys left for home, not to return.

In October, 1934 Mr. P. A. E. Greenwell, Aide for Agriculture, Dr. G. Gordon Brown, Headmaster at Feleti School and the Superintendent of Education conferred regarding further plans for this school. It was felt that unless a trained agriculturist was obtained for the school, it would be doomed to failure. Therefore, a plan was submitted to the Governor requesting aid from Barstow Foundation in the amount of \$50.00 per month to pay a Bachelor of Agriculture to come down preferably from Hawaii or California, to run the school while working on his Master's Degree in Tropical

Agriculture. He would instruct the boys in farm work or classwork, a period of four hours per day, the balance of the day being his own for his personal problem. All other expenses of the school were to be borne by the Department of Agriculture without added expense over the yearly budget already allowed. The Governor disapproved this plan feeling that if any aid was forthcoming it should be from Washington from the United States Department of Agriculture there.

The annual report of the Aide for Agriculture for the year July 1, 1934 to June 30, 1935 sets forth conditions that pertained up to that time and gives a very good picture of the Experimental Farm and Landenberger Agriculture School.

"The Agricultural Department continues to function in about the same status as when first originated, with the exception that the proceeds from the farm at Taputimu have gradually increased. No school for the education of the Samoan people along agricultural lines has been formed. This is due to not sufficient nor capable personnel being available at the present time. It is believed that any effort or expense along the present lines would be wasted. The plan submitted by this Department on October 17, 1934 for the establishment of a school for agriculture at the experimental farm at Taputimu is still believed to be the most feasible solution of a very difficult problem. This plan would insure competent instruction of students and would place the establishment on a sound foundation. The only other possible solution would be to obtain assistance from the United States. Department of Agriculture." (51)

During the Teachers' Institute of December, 1932 to February, 1933 Mr. R. M. Faulkner of Honolulu gave a course

51. Annual Report of the Department of Agriculture to the Governor by P. A. E. Greenwell, Aide for Agriculture, June, 1935.

in Tropical Agriculture to the teachers. In the Teachers' Institute of 1934, the Superintendent of Education gave agricultural lectures to the teachers on general agriculture as well as some practical experience on Poyer School land. During the 1935 Institute a somewhat similar course was given except that it considered the present crops growing there and how they might be improved and extended. Articles regarding this same material were printed in the O le Fa'atunu in order to get widespread attention rather than being limited to the teachers only. These articles will be found in Appendix A. All articles printed in this monthly newspaper are in both the Samoan and the English language.

The United States Department of Agriculture Experiment Station at Honolulu has been very cooperative in fulfilling all requests made of it and furnishing many trees, plants, and seeds of tropical fruits that have proved successful in Hawaii. These have been planted on the Experimental Farm at Taputimu and some of them are thriving. Efforts to have them spread over the Islands have been more or less abortive. The Samoan people themselves have sat back and waited until it was done for them. Two cases are known where requests have been made for materials from the farm and carried through to having them planted. All other requests have presupposed the farm laborers transporting and planting of material.

52. Statement made to writer by Ex-Governor O. C. Dowling confirmed by observation.

The following which is quoted from the Annual Report for 1935 of Governor O. C. Dowling to the Secretary of the Navy gives a fair picture of agriculture as it was in American Samoa in June, 1935.

"With the rapid increase of population on a very limited area of arable land, development of sound agriculture is essential if the people are to continue to increase and remain self-supporting. The people must be educated and trained to improve the productivity of the very limited arable lands and to grow better and more varied foods.

In time the Islands will be denuded of their limited timber resources, and no suitable woods will be available for the varied native arts and crafts. Non-arable areas should be reforested by the planting of seedling trees, such as the quick growing teak, in order that a future timber supply may be assured.

With this end in view, and with the small funds available a very presentable experimental farm has been established at Taputimu, where various kinds of fruits, nuts, vegetables, and shade and timber trees are being grown to prove their adaptability to the soil and climate of the Samoas, these proven products to be distributed free to the natives.

The Agricultural School at the Experimental Farm, where a limited number of Samoan boys were under training has not proven a success, the Samoan boys disliking the hard work of farm life, without pay, and remaining but a short time. The experiment has therefore been abandoned.

Samoans do not take a great interest in the Department of Agriculture, generally being indifferent to its aims and displaying a general apathy towards the entire agricultural program.

Federal aid should be extended to agriculture, not only by direct grants, but by the detail of an expert from the United States Department of Agriculture in order to instill in the Samoans an interest in this subject and prepare them for the most distant day when the food supply will not support the increased population."

In the last few months the outlook on the Experimental Farm at Taputimu has changed greatly, due to changed conditions in Samoa. The present plan calls for maintaining the fruit trees, nut trees and lumber trees growing there but to stop raising vegetables that the Samoan does not use. Samoan crops such as bananas, breadfruit, taro, papaias, yams, and others will be grown in the most modern way. It is hoped in this manner to demonstrate to the Samoan the best way to produce his own crops. Possibly in this way he will be more inclined toward better agriculture and to prepare for tomorrow when the population will be greater.

4. Necessity for a Changed Conception of Agriculture.

The foregoing paints a rather gloomy picture of agriculture in Samoa. The statement is often made that the Samoan will do nothing until he has to. There is more than a germ of truth in this, but many other facts must be considered before it can be accepted per se.

According to the 15th Census of the United States of 1930 dealing with American Samoa there were 2347 males and 142 females of 10 years of age and older engaged in gainful occupations. Of this number 1758 males and 65 females were classed as farm foremen and laborers or farmers, either being owners or tenants. This represents on the part of the males

a total of 74.48 per cent and of the females 45.77 per cent of the whole. Having such a preponderance of the population engaged in the production of food and copra is undoubtedly the reason for the apathy toward change. Sufficient food is produced to care for the present population, so why worry. Also, the young folks growing up can carry on as their elders have done in the past, possibly reclaiming more land as needed, so still why worry. If the Government is so anxious to bring in new crops or produce more crops for cash income, who is to benefit? If the Government, it should be the one to do the work. Also, if there is a shortage of food the American Government will look after Samoa as it has in the past.⁵³

If more money is needed than received from the copra and the curios produced there are aigas (relatives) among the Fita Fita Guard, teachers, or workers at the Naval Station⁵⁴ whose duty it is to help. With such an outlook as this one can understand the apathy shown toward agriculture.

Surrounding, or in close proximity to each village, are found the plantations of taro, bananas, breadfruit, coconuts,

53. Keesing Modern Samoa, 343.

54. After talking to 25 of the teachers, 15 members of the Fita Fita Guard and 10 workers on the Naval Station proper, the writer determined that an individual who receives a monthly salary gets to use only 50 per cent of that salary for his immediate family. The other 50 per cent has to be turned over to relatives for their use. Requests are made of them and to refuse would mean ostracism and loss of "face." Therefore help is never refused. This conception of family membership is entirely foreign to the American outlook but it means everything in Samoa; in fact, it is Samoa.

and yams from which the village derives its food supply. These plantations are not cared for as a whole by the village group but are handled by each family group. Usually the plantation boundaries are unregistered but are well known to members of the family as well as other members of the village itself. The ownership of the land or rather the right to use it usually lies in a family group represented by one or more matai or chiefs. When a new individual is chosen to hold a title, he sometimes reallocates the lands in his care to the families or he lets matters carry on as in the past. Usually there is more land than cultivated by the group under him so it does not become necessary to make the change. ⁵⁵

To the individual holding the matai title the importance of the title is directly proportionate to the amount of land that is part and parcel of the title. In the matai's family group there may be two or three or possibly more untitled men and their wives and children. However, certain matai titles are of such importance that there are two or three lesser matai in the family group. In this case, more untitled men would be available for family business. At any rate the untitled men and their families care for the plantations of the family, harvest and transport the food to the village, prepare it for cooking, cook it, and serve it to the matai and after he is through eating, eat what is left themselves. Usually this cooking, or as it is commonly spoken of in Samoa

55. Keesing, Modern Samoa, 270-277.

as "making the oven," is done once a day, the other meal or meals being eaten cold. The untitled men and their families also collect, cut and dry the copra, feed and care for the pigs and sometimes go fishing. As has been mentioned before, this group is often kept very busy in preparing and helping in the ceremonial affairs of their matai. Often the idea is held by the matai that when they achieve this rank their days of strenuous work are over. As long as sufficient food for the family and a fair amount of copra for taxes are produced, he does not exert himself greatly in having his workers produce more. Also, each one of the workers is naturally interested in how much his co-worker is doing and tries to be sure that he does no more than his own share. Consequently, unless the matai is closely in touch with the plantation and what is taking place there, nothing more than absolutely necessary is done. Here is the place where improvement in greater production and better care can be made, and here only. It depends solely upon the matai of the family group and not the rank and file of the people. If the matai is primarily interested in ceremonies and in maintaining the prestige of his title, he spends very little time inspecting his plantations with a consequent loss of production there.

Members of the Fita Fita, teaching profession and other earning groups are expected and do turn over varying amounts of their income to the family matai. This is not necessarily in the form of money, but may be purchases at the stores. In

this way earning members of the family must help those that are non-earners through their matai and in turn expect to be provided for when they need it.⁵⁶ Also, if a non-earner receives some money or goods in some manner he is liable to the importunities of his relatives and friends as well.

A teacher receiving \$25.00 on pay day may pay \$10.00 on his debts to the stores, may pay \$1.00 on his loan from the Teachers' Association Fund and arrive home with possibly \$3.00. The balance of \$9.00 has gone hither and yon to relatives, or using the Samoan word which better fits, "aigas."

This same holds true in the cases of other groups or individuals who receive an income. There is absolutely no intention of repaying what to us would be considered a loan and it is not expected. It is simply Samoa.

Quoting from the Annual Report of Governor G. S. Lincoln for the year 1931 on agriculture:

"...After our 30 years occupation however...agriculture is little better than 30 years ago.... The most important need is improved agriculture, and strenuous efforts by the government to advance this science meet with disappointing results. The Samoans knowledge of agriculture is adequate to produce superior results but he will not work. In an effort to increase the output of copra two copra inspectors for the Western District and two for the Manu'a District were appointed to encourage, inspect, and report on copra plantations. Thus far the results have been negligible. An inducement for them to work for their own benefit is needed to obtain increased production. I recommend that a qualified agricultural advisor from the Department of Agriculture be sent here. He could

56. Keesing, Modern Samoa, 324

point out better methods to the people in general and help those who showed a desire to improve conditions." (57)

From the above, the reason for the lack of work mentioned in the report quoted is evident. Increased results could be attained by more work, but one can disagree heartily that the Samoans knowledge of agriculture is adequate to produce superior results. The lack of knowledge in this line is appalling as will be made more evident later. The reason the copra inspectors were unsuccessful in producing results was the fact that they were very minor chiefs and could not talk up to the more influential ones.

Too often past attempts to foster agriculture have overlooked the communal set-up and social customs of the land. For the Samoan, the present set-up of matai and family groups is best. He is protected, he is fed, he is allowed to live and be happy. His thinking is done for him and except for a certain amount of time required of him by his matai and family he is free more or less to enjoy himself. In his youth and old age he is provided for in the group in the matter of clothes, food and shelter. In times of trouble his matai and family is ready to take his part and to see him through. It is because of these factors that the statement is made that the present set-up is best. And still agriculture suffers.

57. Annual Report of the Governor of American Samoa to the Secretary of the Navy, 1931.

As has been pointed out change can only come through the matai themselves. They have been urged, encouraged and harangued about doing this and that to obtain more money for themselves. What has failed to be stressed is--what is to be done with this money when it is obtained? A fear is felt that if more income is produced, the members of the family group will lose their present close tie-up with the matai with a consequent collapse and loss of conditions as they are today. Individualism would come and the rights and powers of the matai would be lost. With this in mind and yet realizing that many benefits from improved agriculture would accrue the matai knowing that if they push their working men too far they will desert and go to some other branch of the family in some distant village to live, the easiest solution for the matai is to do nothing.

Therefore, it is necessary for the two groups in American Samoa to have their conception of agriculture changed--the Government or authorities and the Samoan people as represented by the matai. The Government on the one hand as to "How" it should be done, and the Samoan on the other as to "Why" it should be done.

CHAPTER II

PHYSICAL FEATURES OF AMERICAN SAMOA

1. Location.

American Samoa lies in the South Pacific Ocean and is comprised of all the islands in the Samoan Group east of longitude 171 degrees west of Greenwich and extending to longitude 168 degrees and 10 minutes west of Greenwich but including Swains Island which lies 171 degrees 6 minutes west. These islands lie between latitudes 11 degrees 3 minutes South and 14 degrees 22 minutes South. The group is made up of Tutuila, Aunu'u, Ofu, Olosega, Ta'u, Rose, and Swains Island.¹ Steamer schedules list the distance from Honolulu² to Pago Pago as 1565 miles.³

2. Area.

The area of American Samoa is 62.6 square miles divided up by islands as follows: Tutuila and Aunu'u 40.2 square miles, Ofu and Olosega 3.7 square miles, Ta'u 14.0 square miles, Rose Island 0.2 square miles, and Swains Island about 4.5 square miles.³

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1. Latitudes and Longitudes furnished by the Captain of the Yard's Office, Naval Station, Tutuila, American Samoa.
 2. Schedule furnished by the Oceanic Steamship Company.
 3. Areas furnished by the Captain of the Yard, Naval Station, Tutuila, American Samoa. These figures are the most accurate obtainable and as will be noticed differ considerably from other figures quoted in times past. These figures are used by the Navy for all of their work.

3. Elevations.

There are pronounced elevations on each of the islands except Rose and Swains Islands which are coral atolls. Tutuila is long and narrow with a ridge rising very quickly to an elevation of from 600 to 700 feet. The important mountains on Tutuila are Matafao, 2141 feet; Fioa, 1717 feet; Olotele, 1639 feet; Alava, 1609 feet; Oloava, 1501 feet; and Tuasivitasi, 1432 feet. (See figure 1).

Aunu'u and the Manu'a Islands, Ofu, Olosega and Ta'u, are somewhat conical, rising in order to 200, 1587, 2095, and 3056 feet respectively. (See figures 1 and 2).

4. Area Available for Cultivable Crops.

All of the Islands of American Samoa are of volcanic origin except Rose and Swains Islands which, as mentioned above, are coral atolls. Insofar as Rose Island is uninhabited and unused by the people, being separated by 80 miles of water from Ta'u, its closest neighbors, it will be considered no further in this paper. Also, Swains Island is 210 miles north of Tutuila, supports a population of about 100, sends no agricultural products to the other islands of American Samoa and only has contact with Tutuila once a year when the station ship pays a call on the Governor's yearly inspection.⁴ This inspection is made to check up on population, health, and economic conditions. The station ship is a mine layer that is attached to the Tutuila Navy Yard for

4. Population as of June 30, 1935, was 94. Figure furnished by the Attorney General, Naval Station, Tutuila.



Figure 1. Shape and Elevation of Tutuila and Aunu'u

Scale 1" = 12,000 feet



Figure 2. Shape and Elevations of the Manu'a group

Scale 1" = 8,700 feet



Figure 4. The Manus Group Showing Agricultural Land.

Legend:Areas enclosed by dotted lines are suitable for cultivated crops.
 oooooAreas enclosed by circles suitable only for tree crops.

Scale 1" = 8,700 feet

such purposes as this. Copra produced there is marketed at Apia which is in Western Samoa. Therefore, Swains Island will be considered no further in this paper as far as agricultural education is concerned.

The Island of Tutuila is about 18 miles long and about 5 miles wide in its widest part. A mountain ridge runs almost the whole length of the island with spurs on each side and with indentations of deep valleys. A great portion is extremely rugged, especially in the eastern end.⁵ There is little level land except at the foot of the mountains and a large fertile plain extending on the southwest side from Nu'u'uli to Leone. (See figure 3).

The north side of the island is very precipitous with a few small level areas where villages are located. All hills and slopes are covered with a growth of trees in great profusion, oftentimes on cliffs that appear incapable of having anything stick to them.⁶

As mentioned earlier the Manu'a Islands, Ofu, Olosega and Ta'u are somewhat conical in shape. The island of Ofu in the center and on the eastern side is very rugged and rocky, this making a great deal of it unfit for use in the production of crops. The same can be said for Olosega which has even less land for use. The northern and eastern sides

5. Bryan, History of American Samoa, October, 1926, 4.
(Mimeographed Copy)

6. Ibid.

of this island are absolutely worthless for food production due to a very steep and rocky ridge that sticks up from the sea. The area on which the village of Olosega is situated is a level one about 200 yards wide from which place the high ridge goes straight up to an elevation of a thousand feet. Practically all of the food is produced on a slope on the eastern side of the island which is located about two and a half miles from the village itself and only reached after a very warm climb to 800 feet of elevation.

Ta'u is by far the largest island in Manu'a. A great deal of the land on the northern side is precipitous and rocky as is also true of the southern side. Quite large level plateaus are to be found on the western side and extend up to Lata whose elevation is 3056 feet. However, there are large sections of these areas that are very rocky, and not usable except for native trees at present.

"The soil is a rich mold upon the slopes and even upon the precipitous mountain sides, while the valleys and level tracts are a deep alluvial deposit of the same, the whole a decomposition of vegetable matter, with only a slight proportion of decomposed lava. This being impregnated with iron makes a vigorous tillable loam. So rapid is the growth and decay of vegetable matter, and so long has it been accumulating, that the interstices of broken lava upon abrupt declivities are filled with soil which is again protected from heavy washes by trees and shrubbery. Lava beds descend to the sea in many places, with black and forbidding faces." (7)

7. Bryan, History of American Samoa, October, 1926, 13.
(Mimeographed Copy)

The above quotation pictures partly the conditions to be found in American Samoa but it leaves much unsaid and some exceptions must be made. A few of the level tracts are deep decomposed lava and humus deposits but most of them are shallow, not extending over two or three feet in depth. Below that, solid lava is found and near the seacoast an underlying strata of coral limestone. The deep colluvial deposits are to be found on certain slopes in Manu'a and in the heads of the valleys on Tutuila where the soil has washed down in heavy rains and mixed with the decaying vegetation to form excellent fertile spots. Here as elsewhere in the world the soils differ materially even within an area of a few yards. On the whole the soils can be classed as clay loams. On areas that have been cultivated continuously for many years the fine soil has settled, leaving coarse granular particles on top due to the great amount of rainfall that occurs. However, it may be said for the Samoan people that these areas are very few in number because in the past they have not used areas continuously but have rather used new lands from time to time and allowed others to lie fallow a few years. No cover crop is planted because Nature immediately covers the area and growth and decay build back the soil.

Only in Manu'a and a very few spots on Tutuila are there soils free of stone, making possible the use of implements to work the soil such as hoes for weeding. Otherwise the soil is full of rock particles from one to three inches in diameter making even the use of a pick quite a problem.

It has been the good fortune of the writer to traverse all islands of American Samoa under consideration here in line with his work as Superintendent of Education for American Samoa. All villages have been visited five times and some many more. All plantations have been visited at least twice and some oftener. On these visits, areas have been noticed closely because there are no figures available for total cultivated land as no such survey has ever been made. However, there are given in the 15th Census of the United States (1930) pertaining to American Samoa, figures listing areas in taro, yams, tobacco, arrowroot and sugar cane to the total of 966 acres. However, this does not give banana, coconut, breadfruit and other acreages.

It is estimated that the area available for cultivable crops in American Samoa is 11,596 acres, made up as follows; Tutuila and Aunu'u 7,118 acres, Ofu 66 acres, Olosega 403 acres, and Ta'u 3409 acres. With the population of 11,466⁸ as of December 31, 1935, this gives 1.01 acres per person.⁹

5. Area Available for Uncultivable Crops. (Trees)

In the previous section the estimate of area given was for cultivable crops. In this estimate was included the land used for coconut production with the understanding that it could be cultivated even if it isn't. (See figures 3 and 4 for cultivable areas).

8. Estimate by the writer.

9. Population figure obtained from the Attorney General's annual report to the governor, December 31, 1935.

As has been mentioned, many areas on steep slopes are covered with tree growth that seems to hang on by a miracle. These areas cannot be rightfully considered as areas for tree crops. Many of these trees are used in house building, boat building, and for other uses, but the seed was spread by birds or wind, and not man. Much of native construction is dependent upon local wood which is to be found here and there through the bush. In estimating areas available for tree crops it is the intention that these areas are to be used for timber trees that will produce timber for sale outside of Samoa or for home use, such as the teak (*Tectona grandis*) or sandalwood (*Santalum album*). However, there is more rainfall in American Samoa than is best for the sandalwood. Therefore, it is estimated that there are approximately 4618 acres that could be used for uncultivable crops as follows: Tutuila and Aunu'u 2520 acres, Ofu 242 acres, Olosega none, and Ta'u 1856 acres.¹⁰ (See figures 3 and 4).

Adding this total of 4618 acres to the 11,596 acres for cultivable crops we have a total of 16,214 acres or 25.3 square miles. This then leaves 32.6 square miles of land that is either unfit for use due to its precipitous ridges, its great outcroppings of pure rock or to inaccessibility for lumbering. This means then that a little less than a half of the area of American Samoa is usable.

10. Estimate by the writer.

6. Area Available for Animals Not Included Above.

Insofar as native trees that are used for timber and dyes are scattered throughout the bush it would be rather difficult to use the bush areas for animals as they would damage the trees as well as other growth already present. However, there are a few areas on Tutuila where animals could be raised; areas which are unfit for crops of any sort. These areas are along the seacoast between Tafuna and Vaitogi which is land covered with lava flows but on which there is some grass and shrubs. The estimate of this area is 980 acres. (See figure 3).

7. Types of Soil.

It is not the intention to cover soil ingredients in American Samoa, rather leaving that to later chemical analyses as and when needed. Suffice it to say that Tutuila, Ofu, Olosega, Aunu'u and Ta'u are all of volcanic origin and therefore the soil is made up of decomposed lava and decayed vegetable matter except near the seashore where often this is mixed with calcium of the weathered coral from old underlying reefs. At the base of the steep inclines much clay is to be found which makes the soil there very dark, wet, and sticky. However, on the level and gently sloping areas the soil is reddish in color and is a fine loam closely resembling the soil of Wahiawa, Hawaii, in appearance. Except for the large plain between Nu'uuli and Leone on Tutuila, and a part of Aunu'u the soil is the dark, wet sticky clay soil mentioned above. However, on the islands of Ofu, Olosega, and

Ta'u most of the soil is the red loam, with the clay soil much less in evidence. Both types of soil appear to be sufficiently fertile to produce good crops but undoubtedly the clay soils would do better if there were a little better drainage. The loam soils produce larger returns except in the case of taro where the opposite is true.

8. Rainfall.

On pages 43, 44, and 45 will be found figures 5, 6, and 7 dealing with rainfall in American Samoa. These figures are complete and give a clear picture of the amount of rainfall and time of precipitation.

9. Temperatures.

On page 46 will be found figures 8 and 9 dealing with the monthly temperatures in American Samoa. These figures are self-explanatory and need no further remarks.

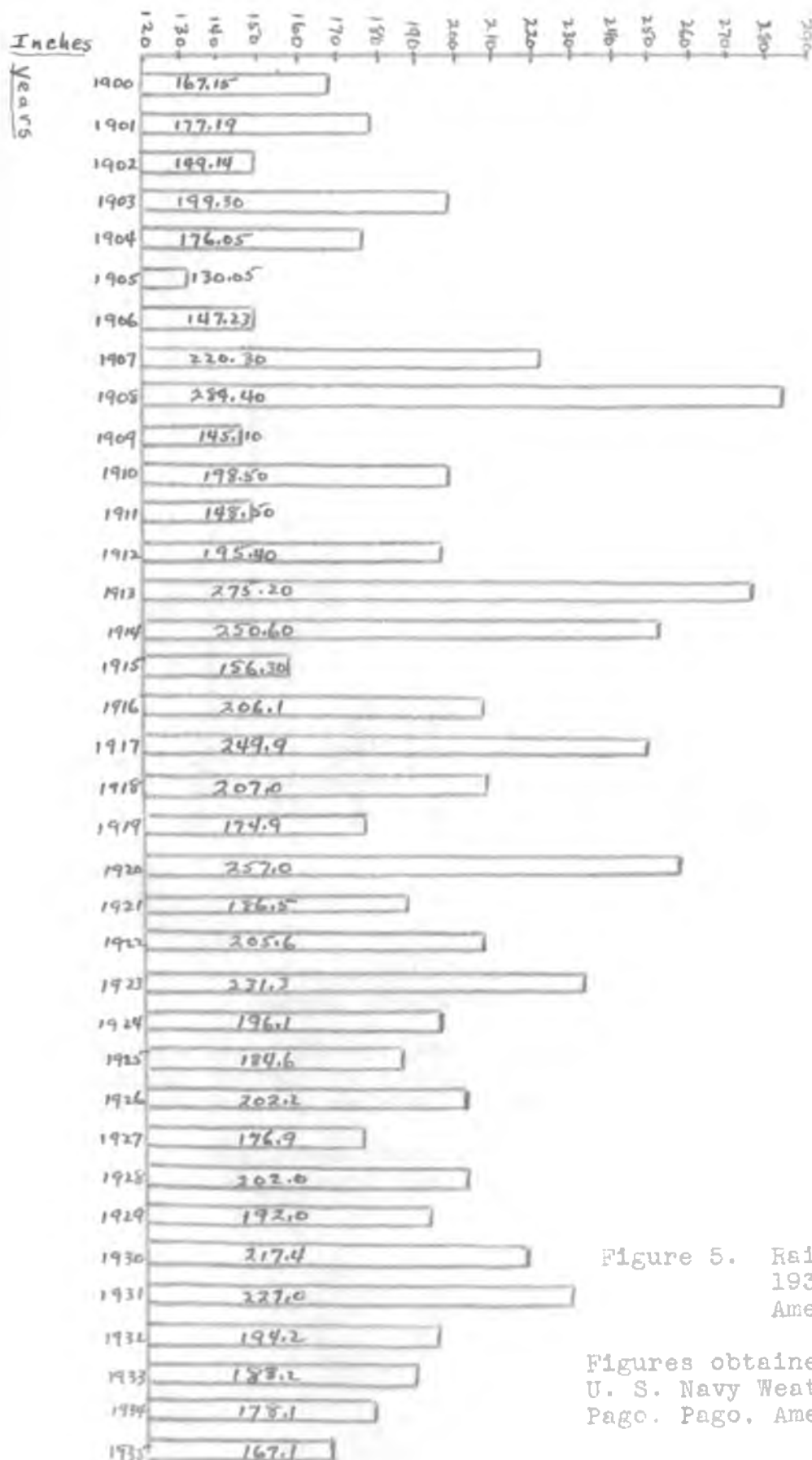


Figure 5. Rainfall 1900-1935 Tutuila, American Samoa

Figures obtained from the U. S. Navy Weather Station, Pago. Pago, American Samoa.

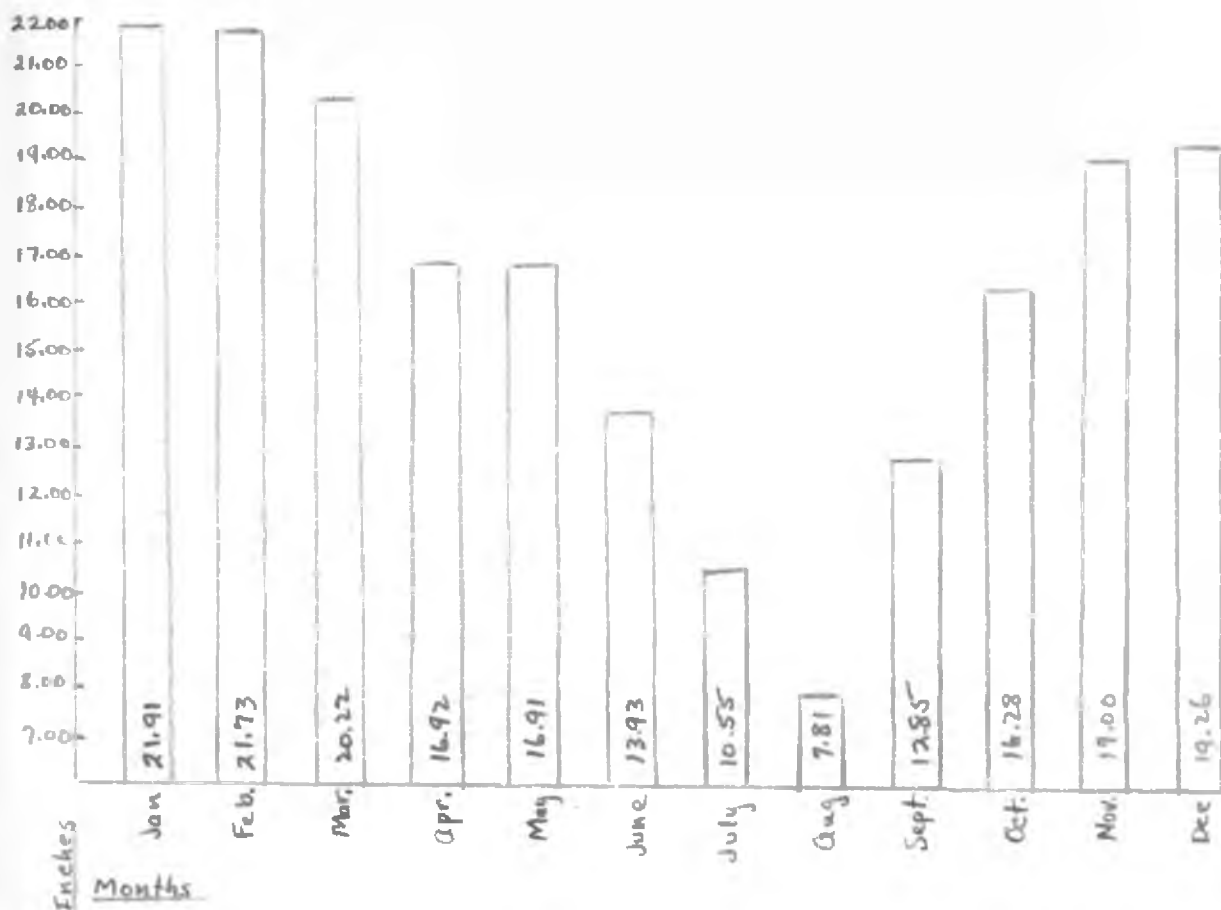


Figure 6. Average Rainfall by Months, Tutuila, American Samoa, 1900-1925.

Average rainfall per year, 1900-1925-----196.24 inches
 Maximum monthly rainfall, May, 1915----- 60.50 inches
 Minimum monthly rainfall, June, 1900----- 00.10 inches

The above figures obtained from the U. S. Navy Weather Station, Pago Pago, American Samoa.

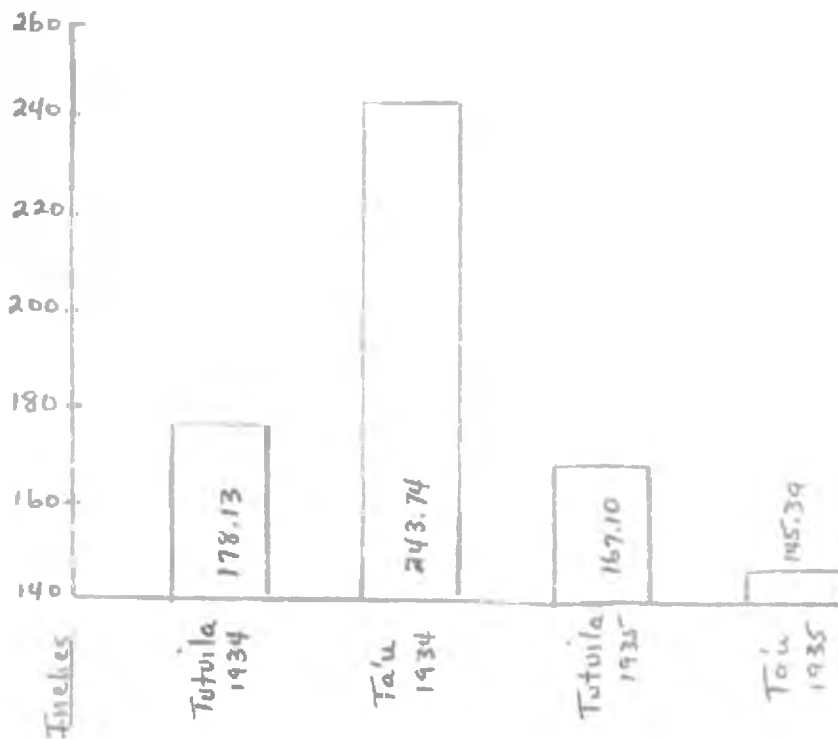


Figure 7. Rainfall 1934 and 1935 for Tutuila and Ta'u

In June, 1933 a new weather station was started at the Ta'u Dispensary which gives records for Manu'a. The above figures are given for the complete years of 1934 and 1935. The figures given were obtained from the U. S. Navy Weather Station, Pago Pago, American Samoa.

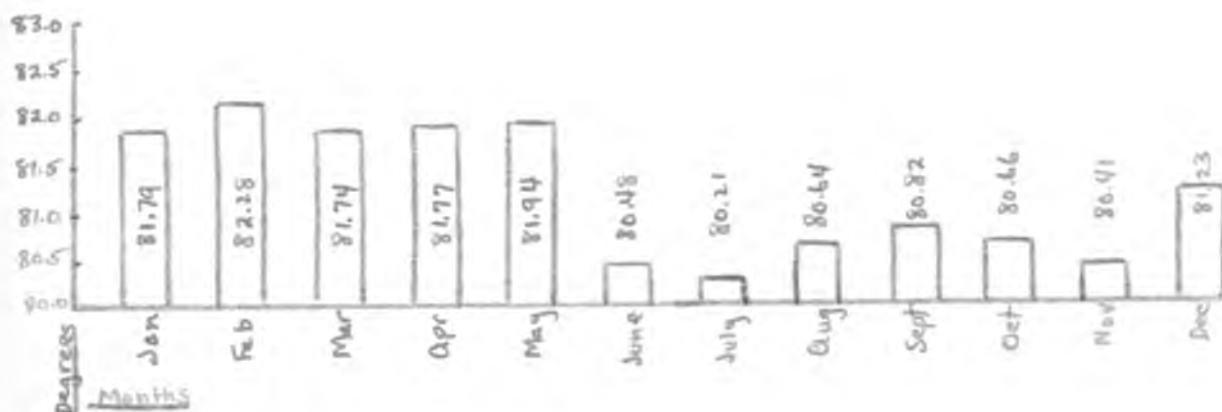


Figure 8. Average Monthly Temperature, 1900-1925
Tutuila, American Samoa.

These figures obtained from the U. S. Navy Weather
Station, Pago Pago, American Samoa.

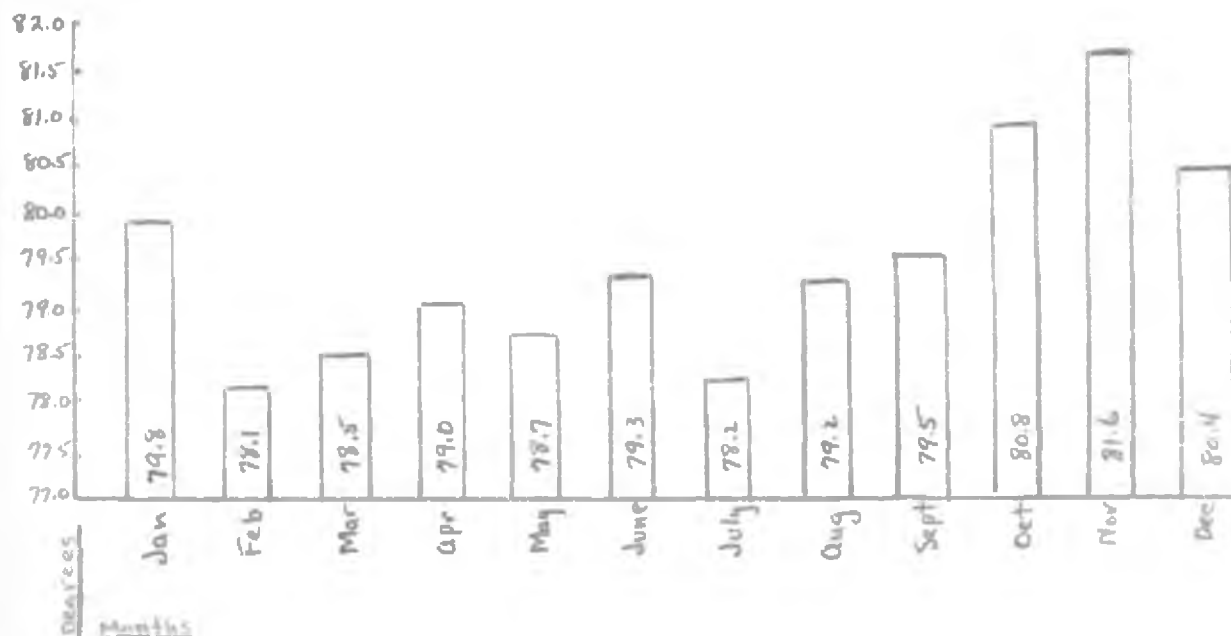


Figure 9. Average Monthly Temperature, 1933-1935,
Tutuila, American Samoa.

These figures obtained from the U. S. Navy Weather
Station, Pago Pago, American Samoa.

CHAPTER III

SURVEY OF PRESENT AGRICULTURAL SITUATION

1. Present Crops and Animals Produced.

In 1930 a survey of crops and animals produced in American Samoa was made in conjunction with the 15th Census of the United States pertaining to the population of American Samoa. This survey will have to be referred to for production figures as no accurate check has been made since and none will probably be made until 1940. In the case of copra production where yearly figures are available, these will be given.

In all countries the first consideration of a people is food. As all crops produced in American Samoa are food crops as well as cash crops in some cases, they need not be divided up in that manner.

Taro (*Colocasia antiquorum*) is the basic food. In 1929 there were 714 acres of taro with a production of 1,746,880¹ corms. This taro is produced both as dry and wet land taro, the largest area in wet land taro being on the Island of Aunu'u. (See picture in Appendix C). Most of the taro produced, however, is of the dry land variety and is in very small plots usually not more than six hundredths of an acre in size. These are located on the slopes near the villages

1. U. S. Dept. of Commerce, Bureau of the Census, Fifteenth Census of the United States; 1930. Population-Agriculture, American Samoa. (Hereafter referred to as U. S. Dept. of Commerce, 15th Census).

and the area is changed quite often to prevent soil exhaustion and other ills. In preparing the soil for planting the trees and weeds are removed, and then a pointed stick or oso is driven into the ground about six inches and moved to and fro to make an opening and then the taro shoot inserted and the soil surrounding tamped down a little with the foot. No turning over of the soil or loosening of it is done, other than mentioned. In the last two years several villages have had trouble with Taro Root Rot. Suggested remedies such as given in U. S. E. S. Sheet No. 11 issued by the U. S. Experiment Station at Honolulu October 1, 1918 were given to these villages. Most of the villages selected new land for their taro, but shoots from diseased areas were used instead of disease free shoots, a practice which only spread the disease. In no case was ground limestone applied as a remedy to the area affected. The taro on the whole is cared for quite well.

The Samoan raises no green food as such but uses the leaves of the taro plant in making palusami. In this the younger leaves near the center of the plant are mixed with coconut cream and sea water, or without sea water and baked in banana leaves in the oven. This makes a very delicious and palatable dish. Other uses for taro are best described² by Dr. P. H. Buck.

2. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 130, 131.

The hurricane of January 16, 1936 whipped the leaves about considerably but no serious loss resulted as the taro never gets higher than three feet and is usually planted in a protected spot. This is as it should be because a Samoan can do without all other foods, but he must have taro.

Bananas (*Musa sapientum*) play a very important part in the diet of the Samoan. Ordinarily he eats it green rather than ripe, but a few bunches are ripened to eat raw. When the fruit is fully formed, it is peeled and baked in the oven or umu along with the taro and breadfruit. The production figures for 1929 are as follows: 262,590 plants³ with a production of 260,590 bunches.

These plants are pretty well scattered throughout the bush being both near and far from the villages. The planting is done the same as in the case of taro except that no weeds are cleared off. Following this planting almost no care is given, but the plant is left more or less to grow on its own. There is a little damage to most of the bunches due to a scale that causes a rather undesirable appearance and would make them unfit for export, but otherwise does not hurt them for food use. In April of 1934 a small colony of *Apantipis Ichneumonoid* was released on Tutuila to destroy the larvae⁴ caterpillar of the moth that causes this scale. It is

3. U. S. Dept. of Commerce, 15th Census, 11.

4. Annual Report of the Department of Agriculture to the governor by P. A. Greenwell, Aide for Agriculture, June, 1934.

still too early to say definitely what the result of the presence of this parasite will be.

Breadfruit (*Artocarpus incisa*) is used considerably as food during the periods of the year when it is ready for eating, usually around March and November, but there is quite a little carry-over so that this crop is used about eight months out of the year. Here again the fruit is picked when fully formed, but still green, peeled, and then baked in the oven. The tree itself is found planted extensively. Many trees are to be found around the fales (houses) in the villages and in close proximity to the village, but there are some throughout the bush intermixed with the coconut trees. The Samoans love breadfruit and are very skillful in getting root suckers to transplant. 1929 figures list 25,230 trees with a production of 2,522,325 breadfruit. In the hurricane of January 16, 1936, many breadfruit trees were blown down and others badly broken, but it is probable that there are still as many trees left as listed for 1929, due to new plantings since that time.

Yams (*Dioscorea*) are produced to some extent in Samoa as food, but form no important place in the Samoan diet, probably due to the great amount of labor necessary in cultivation. When produced, they are well liked. They are used mostly by the elderly people and chiefs who feel that

5. U. S. Dept. of Commerce, 15th Census, 11.

they are good for them. They are planted, prepared, and⁶ cooked much the same as taro. 1929 figures list 67 acres⁷ of yams with a production of 229,140 pounds.

Pineapples (*Ananas sativus*) are raised as a fruit but only in small patches of a dozen or two plants usually adjacent to the fale of the owner. They do fairly well, producing fruit of four to six pounds being very sweet and juicy. Almost invariably the crowns are planted in a hole made with the oso in fairly rocky soil. No trimming of the lower leaves is done to help root growth and no drying of the butts is done. This probably accounts for the high mortality in the plants. Another peculiar thing to be noted is that in all pineapple plants no slips are found and very few suckers. This means, on most plants, one crop only. This fruit undoubtedly should help to give variety to the great amount of carbohydrate that he eats. 1929 figures list⁸ 18,006 plants with a production of 18,006 fruit.

Oranges (*Citrus aurantium*) are grown to some extent as food. The Samoan loves the juice of the orange produced about three weeks before it is really ripe as at that time it is not sweet, but rather insipid. In fact, the Samoan does not like any food sweet. The orange juice as well as the pineapple juice undoubtedly helps in the variation

6. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 133.

7. U.S. Dept. of Commerce, 15th Census, 11/

8. Ibid.

of his diet. 1929 figures list 2080 trees with a production of 271,940 fruit.⁹ Some of these are sold to the Caucasian people of the Island of Tutuila, but in very limited quantity. The trees usually are around the fales in the villages or on the outskirts.

Lemons (*Citrus limonum*) and limes (*Citrus acida*) are produced on so few trees that they can be considered together. Lemons and limes are used almost entirely by the Samoans for making a fruit drink that they love. Sugar is added until the solution is almost a syrup. Here is one place the Samoan indulges himself with sweets. To a Caucasian the drink is so sweet it is sickening. However, here again the Samoan usually picks the fruit green so that there is not as much juice in it as there would be if it were left on the trees for about three weeks longer. Consequently most of the limes used by the Caucasians at the Naval Station are brought over from Western Samoa as there they have learned to allow the fruit to ripen and it is excellent. The fruit sold locally is about one-half the size and contains only about two drops of juice instead of a third of a glass full. 1929 figures list 259 lemon trees with a production of 25,800 fruit and 279 lime trees with a production of 55,800 fruit.¹⁰ These trees, as in the case of oranges, are usually in the villages or on the outskirts of them.

9. U. S. Dept. of Commerce, 15th Census, 11.

10. Ibid.

Papayas (*Carica papaya*) are raised principally for infant and invalid feeding, otherwise they are not used much. In addition to the above uses some are sold at the Naval Station to the Caucasians. Some are used green and baked in the imu with coconut milk. Of the ripe fruit a safe estimate would be that a Samoan adult does not eat more than one ripe papaya a week. It may be noted that the papaya produced in American Samoa is smaller than the ones ordinarily raised in Hawaii and are very sweet. In two years residence there one or two papayas were found that were not excellent in all ways, and this observation is based on having the fruit almost¹¹ every morning for breakfast. 1929 figures list 18,494 trees with a production of 184,940 fruit.¹² These trees are to be found in the villages or in the outskirts.

Mangoes (*Mangifera indica*) are produced throughout the group, usually in or near the villages, entirely for local consumption. Most of the fruit is eaten by the children when it is about one-third or one-half ripe. The adults eat very few of them. The fruit is large, being about twice as large as the Pirie Mango in Hawaii and of a rather flat flavor. 1929 figures list 1615 trees with a production of 308,760¹³ fruit.

11. By the writer.

12. U. S. Dept. of Commerce, 15th Census, 11.

13. Ibid.

Avocados (*Persea gratissima*) are raised ordinarily for local consumption. Some are sold to the Naval Station personnel. The trees are usually to be found in or near the villages. The Samoans eat these pears raw and ripe, but are not especially fond of them. This accounts for the small number of trees to be found. 1929 figures list 918 trees¹⁴ with a production of 68,375 pears.

Arrowroot (*Tacca pinnatifida*) is raised in American Samoa mostly on the island of Tutuila where in 1929 there were four acres with a production of 3478 pounds.¹⁵ The roots are grated on a sennit grater, washed and rewashed in wooden bowls. Arrowroot is used with coconut milk in different forms and¹⁶ baked in the umu.

Sugar Cane (*Saccharum officinarum*) is raised primarily for the leaves which are used for thatching of the fales, but the stalks are also used for the juice. (See picture in Appendix C). The juice is obtained by peeling the stalks with the teeth and chewing the balance. The cane is raised usually in the outskirts of the villages, but is at times found quite a little distance away. 1929 figures list 13 acres with a production of 63,675 pounds of cane.¹⁷ The cane is a short variety having stalks about three-quarters of an inch in diameter and being a deep reddish purple color. It is ordinarily planted in plots about a twentieth of an acre in size. The

14. U. S. Dept. of Commerce, 15th Census, 11

15. Ibid.

16. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 135.

17. U. S. Dept. of Commerce, 15th Census, 11.

internodes are very short averaging not more than an inch and a half in length. When planted, a piece of stalk about eight inches in length is pushed down into the soil on a distance of about three inches. No other preparation is done except that a few of the larger weeds are cleared off. The leaves of the plant never get more than two and a half feet and the stalks never more than six feet which is unusual.

Another crop that is raised but is not listed in the Fifteenth Census is Tapioca (*Mannihot utilissima*). No areas of this plant are available, but it is estimated that there are six acres, the most of which is in Manu'a.¹⁸ Cuttings of about twelve inches in length are planted in hills, about four cuttings in a hill. The tubers are used in making a pudding with coconut cream which is especially well liked in Manu'a. On the slopes of well-drained soil to be found in Manu's this crop does very well.

Sweet Potatoes (*Ipomoea batatas*) are not raised or used in Samoa as they are in other parts of Polynesia where, as in New Zealand, it was the main article of food of the Maoris.¹⁹ The Samoan, as mentioned earlier, does not like sweet food. The sweet potato being in this class is therefore not relished. In fact, it is only used when necessary. The Samoans have been urged to plant this crop as it is not damaged severely

18. Estimate by the writer.

19. Best, The Maori as He Was, New Zealand Board of Science and Art Manual, No. 4, 1924, Wellington, New Zealand, Dominion Museum Pamphlet.

by hurricanes and produces fairly well in American Samoa. Outside of about two acres at the Experimental Farm at Taputimu, it is estimated not more than two acres are in this crop.²⁰ A considerable portion of these two acres is in school gardens and the balance to be found here and there, a few square feet in each place; used as seed immediately after a hurricane as a quick crop. In the first three months of 1936 the two acres of this crop at the Experimental Farm were removed to make room for other crops that the Samoan enjoys. Therefore at the present time the area in sweet potatoes is about two acres. Let it be said for the Samoan however, that part of the reason that this crop is not raised is the fact that the hordes of rats found throughout the group take a fearful toll of the potatoes before they are harvested.

In 1935 Leone Boys' School had a quarter acre in sweet potatoes which gave every indication above ground of a yield of perhaps eight hundred pounds of tubers. Upon harvesting, however, about fifty-four pounds were realized, the balance having been eaten by the rats.

Kava (*Piper methysticum*) is produced for ordinary use but especially for ceremonies. It is grown near the village in rocky, clay soil. The dried root is used to make a drink which is partaken of in all ceremonies. No estimate of quantity can be given as it is only produced by individuals for their own use. Before the World War quite a little was

20. Estimate by the Writer.

exported to Germany for medicinal purposes, but since that time there has been no exporting. Dr. P. H. Buck best describes some of the ceremonies attached to the use of kava²¹ by the Samoans. (See pictures in Appendix C).

The coconut (*Cocos nucifera*) has been left until last of the list of food crops because it is of so much importance. Without this tree and its fruit it would be hard to understand how the Samoan could exist. He depends upon it for food, for shelter and for cash income. A list of the uses made of the tree and the nuts is to be found in Appendix B.

There is no planting of coconut trees done on systematic lines such as planting them in rows except in the plantation at Mapusaga where the Mormon Headquarters are located. The trees are located both near and far from the villages. In many cases the trees are too close together and in other cases too far apart, but the former more often obtains.

Ripe nuts as mentioned earlier are piled up on stakes to dry and to be free from rat attack. (See picture in Appendix C). These nuts are used in the preparation of certain foods such as coconut cream and are the basis for many others. When new plantings are to be made, some of the nuts that have started to germinate or sprout are taken to the location where they are to be planted. A hole is dug in the ground just large enough to admit the nut and to cover it over with soil. This is done, and then the next one planted.

21. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 147 and 548.

No cognizance is taken of whether there is a thirty foot space each way from the nut or not. Also, if the nut does not grow, no attempt is made to replant for several months and possibly years. Also, the weeds are not kept down and in many cases a new tree starting is all but choked out by weed growth such as the Hilo Grass, and of greater importance, the Mile-a-Minute Vine (*Mikania scandens*). Being planted so shallow and without loosening the soil in the proximity is there any wonder that the tree is so shallow-rooted in American Samoa, with a consequent high mortality rate in a hurricane?

The coconut trees are planted wherever there is room or soil up to an elevation of about 500 feet. They are not necessarily planted in areas of coconuts alone, but are here and there interspersed with breadfruit trees, banana plants, taro plantings and even native lumber trees. This is not entirely wrong, but it does mean that much more time is taken in collecting the nuts for copra.

From a western viewpoint, everything that the Samoan does in regard to the coconut crop is wrong. From his own viewpoint what he does about the matter is correct. It is the personal opinion of some that the Samoan has not done any thinking on the problem for generations. He does what he observes others are doing, which is exactly what they observed from others who have aged and passed away. Therefore, what is done is exactly what has been done for many, many years. The following should be included to better understand conditions.

As already mentioned, no definite policy regarding correct spacing is maintained in planting. No selection of planting nuts is made other than picking out the ones with the largest sprouts in the pile that is drying. The plantings are too shallow, and there is very little effort made to keep the weeds down either when the young tree is starting out in life or later as it becomes a tree and bears nuts. Many nuts that fall are therefore lost in the rank undergrowth. No efforts are made to eradicate the rats that take a fearful toll of the young nuts as they are forming. Steps are cut into the trunks of the trees to facilitate climbing. Green leaves are cut from the trees in order to make baskets, shutters, food trays, and for weights in time of heavy winds. Green nuts are broken off the bunches for drinking purposes. Little effort is made to combat the Coconut or Rhinoceros Beetle (*Orctes rhinoceros*) that causes so much damage to the trees. No efforts are made to remove foreign growth that starts in the steps that have been cut in the trunks of the trees. Bearing trees are allowed to stand for many years after their productivity has decreased beyond their economic usefulness. In other words, many trees are too old for efficient production, and new plantings have not been made to replace these. No fertilization is carried on whatsoever, nature standing the brunt of this work in the decomposition of weed growth. (See pictures in Appendix C showing above conditions).

The above deals with the coconut as a food crop as well as a cash crop. The coconut is prepared for use in the outside world in the form of copra or dried coconut meat. This preparation is done by small family groups. The ripe nuts are gathered by the young males of the family, right at the source of supply. The nuts are husked and either are opened at once and the meat cut out with the aid of the bush knife and taken to the village to be dried, or the whole nut is taken to the village where it is cracked in two by striking it a blow with the back of the blade of the bush knife, and the halves put out in the sun to dry for a day or two. When this is done, it is much easier to remove the meat from the shell. This meat is allowed to dry in the sun for a period of four days, being brought into the house or other building at night or when rain threatens. No sliding trays for more efficient drying such as are used in Kona Hawaii, for coffee drying are used. (See pictures in Appendix C). It is all handwork, the copra being put out on mats and then put back in baskets to be returned to the house at night. The drying work is usually done by the women or elders who are incapable of field labor. When dried, the copra is taken to the weighing station where a government copra clerk weighs it and gives the producer a copra check or receipt for the number of pounds delivered. This check or receipt is used as legal tender in American Samoa. During the year of 1936 a contract price of 2 cents per pound was received from Atkins-Kroll of San Francisco.

Six mills were retained by the Government of American Samoa for incidental expenses, such as wages of copra clerks, transportation and handling charges.²² This meant that the producer received at the weighing station 1.4 cents per pound for his copra. Incidentally this levy of six mills was the lowest charge that has ever been made for this service, showing a desire on the part of the Government to help the producer as much as possible. If at the end of the year there is a surplus, which usually occurs, this money is refunded to the producer.

The above is for the coconuts that go into the making of copra. The nuts to be used for food are brought to the village unhusked and piled up along stakes as mentioned earlier. When needed they are husked, cracked in two, and the meat extracted usually by grating over an iron grater. (See picture in Appendix C). This grated coconut is then taken and squeezed through strainers which extract a milky substance that can be called coconut cream.²³ This cream is used in many ways in food preparations. Dr. P. H. Buck best describes the preparation and use on pages 128 and 129 of his bulletin on "Samoan Material Culture." These preparations are dearly loved by the Samoan and life and food

22. Figures furnished by the Attorney General, U. S. Naval Station, Tutuila, American Samoa.

23. Buck, Samoan Material Culture, Bishop Museum Bulletin 75 (1930), 113 and 114.

habits require their use. A survey made of all public school teachers (59) and 415 chiefs who represent a population of 4677 in American Samoa establishes the fact that four ripe nuts per individual, men, women, and children, are used for this purpose every week.²⁴ A similar survey of the same teachers and chiefs establishes the fact that $1\frac{1}{2}$ green coco-nuts are used daily by every individual for drinking purposes. The number of nuts used for this purpose varies with different villages, being dependent upon the amount and kind of drinking water available, but the figure of $1\frac{1}{2}$ nuts is a very fair average.

The 15th Census as of 1929 lists 275,000 trees with a production of 13,600,000 nuts. These figures were an estimate by the Governor but were the best available at the time. The population as of April 1, 1930 as given in the same Census was 10,055. Using the figure 4 nuts per week per individual as ripe nuts for food and $1\frac{1}{2}$ nuts per day per individual as green nuts for drinking, it is found that 5,761,475 nuts were used. Deducting this from the total of 13,600,00 leaves 7,838,525. It takes 6500 nuts to make a total of one ton (2240 lbs.) of dried copra.²⁵ If the above figure is used, then it would have been possible to produce 1206 tons of copra, whereas for the year of 1929, 1591.35 tons were produced.²⁶ Evidently the estimate as

24. Survey by the writer.

25. Figure furnished by the Attorney General, U. S. Naval Station, Tutuila, American Samoa.

26. See production figures given on following pages.

TABLE III. COPRA PRODUCTION, PRICE PER TON, AND INCOME
FOR AMERICAN SAMOA 1901-1935.

<u>Year</u>	<u>Tons Produced</u>	<u>Price Per Ton</u>	<u>Amount Received</u>
1901	174.4	\$ 43.46	\$ 7,582.65
1902	380.4	62.42	23,751.94
1903	505.7	55.44	28,042.02
1904	553.5	57.69	31,592.46
1905	1146.1	57.50	65,797.78
1906	901.3	54.00	48,690.36
1907	914.9	76.25	70,099.52
1908	1039.9	61.00	63,434.85
1909	1047.1	63.25	66,228.59
1910	1224.9	80.00	97,988.96
1911	1506.3	82.62	124,452.53
1912	1525.7	93.75	143,031.86
1913	791.6	100.25	79,352.52
1914	1138.8	108.00	122,995.94
1915	726.9	85.40	62,074.62
1916	865.3	108.66	94,021.50
1917	1195.8	103.52	123,791.98
1918	1369.3	136.92	187,481.19
1919	730.8	112.58	82,268.94 (27)
1920	986.07	156.80	154,616.21
1921	1269.94	66.20	84,070.04
1922	1302.10	71.21	92,727.24
1923	1234.30	82.62	101,978.12
1924	1750.29	92.12	161,236.32
1925	1314.87	106.00	139,376.22
1926	589.95	108.00	63,714.60
1927	551.62	95.78	52,834.16
1928	1686.54	99.56	167,911.92
1929	1591.35	92.51	147,215.79
1930	1619.04	83.40	135,027.94
1931	356.81	50.15	17,894.02
1932 (Jan.- June)	167.91	33.00	5,541.03
1932 (July- Dec.)	434.39	30.55	13,248.89
1933	609.81	No contract--on consignment	16,088.64
1934	654.43	Same as 1933	17,099.03
1935	1554.86	45.09	70,108.19 (28)

Note: In all cases a ton represents 2240 pounds.

27. Figures 1901-1919 inclusive obtained from Governor Bryan's History of American Samoa, October, 1926, 153 (Mimeographed Copy)

28. Figures 1920-1935 inclusive obtained from records in the Attorney General's Department, Naval Station, Tutuila.

given by the Governor was a little low because the Samoan probably did not cut down any on the nuts used for food. Evidently an estimate of 14,000,000 nuts would have been closer, produced by 283,000 trees.

Production figures of copra, price per ton and income derived are given in Table III because they had to be ferreted out from several sources, and it will remain as a reference table for future use under one heading. Otherwise, no figures except those from 1920 to the present would be used because they would show what is desired for use in this thesis.

Livestock production in American Samoa is a sad spectacle. There are no real dairy farms except one, situated about two miles from the Naval Station. This farm and the animals belong to Ho Ching, a Chinese. Here, as elsewhere, the cattle are grades being a mixture of Ayreshires, Jerseys, Guernseys, and Australian Beef Cattle. They produce very little milk, and outside of Ho Ching who supplies a limited quantity to a few customers in Fagatogo and the Bay area, no attempt is made to build up production. Most of the cattle are raised for fresh beef which is a delicacy at any feast. Consequently, there are not a great many to be found. 1929 figures list 606 head of cattle in the group.²⁹ No importation of blooded stock is being made, and no attempt to increase the number of head of cattle.

29. U. S. Dept. of Commerce, 15th Census, 12.

A few horses and colts are to be found, being used when mature as pack animals for copra and food. This, however, is not widespread because 81 per cent of all horses and mules are to be found in one district alone comprising Mapusaga, Iliili, Vaitogi, and Leone. The reason for this is undoubtedly the influence of the Mormon Missionaries. 1929 figures list 215 horses and colts in American Samoa only four of which are in Manu'a, and 36 in the eastern district of Tutuila.³⁰

A Samoan feast is not a feast unless there is pork. Consequently much time and effort is spent in the production of hogs. Here again the animals are grades but of a better grade than the cattle. Up until the depression was felt keenly in 1931 and later, pure-bred boars were imported from Western Samoa and New Zealand, but nothing has been done since to improve the stock. The majority of the animals are grade stuff being of Berkshire, Duroc Jersey, Hampshire and Poland China ancestry. There are many good animals and some pretty poor ones as well. (See pictures in Appendix C). However, the hogs and pigs always have sufficient to eat as the Samoan is very careful of their welfare. Wealth is measured in fine mats and hogs which is conducive to having many fat animals.

30. U. S. Dept. of Commerce, 15th Census, 12.

Pork figures very conspicuously in many of the customs of Samoa. Dr. P. H. Buck in his Bishop Museum Bulletin on "Samoa Material Culture" pages 119 to 122 describes in detail how these animals are kept and used in the different ceremonies.

The hogs and pigs are ordinarily kept within pig walls made of loose rock or coral about three and a half feet in height and about three feet thick. These walls are usually on the outskirts of the village. Laws in American Samoa require that these animals are to be kept out of the villages by the use of these walls.³¹ This law is obeyed to the letter in Manu'a, but there is only one village on Tutuila that complies with it. Each village has a pig wall, yes, but the walls are used to keep the pigs in the village rather than out of it. The animals wander through the village. through the houses and often sleep on the rocks that are used in cooking. Naturally with such a situation. the fly problem is greatly increased.

Figures of 1929 list 5170 head of hogs and pigs, being more or less located in proportion to the population.³²

It might be said that in the bay area of Tutuila the pigs are kept in small pens built out over the water so that the droppings are removed very soon by the aid of the rainfall and the tide. (See pictures in Appendix C). These

31. Codification of the Regulations and Orders of American Samoa.

32. U. S. Dept. of Commerce, 15th Census, 12.

pens are made of scrap lumber, are very unsightly and are almost always far too small, usually averaging about 3 by 5 feet. A piece of scrap iron suffices for the roof which covers a very minor part of the pen.

What has been said about pork being a necessary part of a feast also holds true for chicken. On many malagas (trips) made by the Superintendent of Education, he has never visited a village without receiving at least one boiled chicken and usually more as food. Every person present at a feast has a roasted chicken placed before him. This method of preparation is solely for convenience as the Samoan much prefers to boil them to procure chicken soup which is greatly relished. Dr. P. H. Buck has some interesting comments to make on chickens as food and their preparation in the Bishop Museum Bulletin 75, "Samoan Material Culture" on pages 122 and 123.

Ordinarily chickens that are raised are a sorry lot. They probably are the result of hundreds of years of breeding in any and all directions. The majority of them are what is termed locally as "Hurricane Chickens." This is due to the fact that the feathers instead of lying down toward the posterior end are just the opposite. They appear as if they are constantly in a hurricane. (See pictures in Appendix C). A few birds are to be seen that look like Rhode Island Reds, but these are few. Probably before the depression pure-bred cocks were imported for breeding purposes but none since that time.

No artificial incubation is done whatsoever, and the hens set wherever they form a nest. The chicks are few in number, and very few reach maturity due to incorrect food and the great numbers of rats who take a heavy toll. A chicken from the time it is hatched until it is used as food lives on coconut, worms, and household scraps too small for the dogs and cats. Due to this food and the foraging that is necessary, the meat is tough and of a peculiar oily flavor. The chickens are not penned, having the whole village and plantation as a range. Small thatched houses are provided as roosts at night away from rat attack.

The hens lay few eggs, and the eggs are small, being the size of pullet eggs. These are used by the family when found, which is not often. All eggs used by the personnel of the Naval Station are imported in cold storage from Australia or the United States. 1929 figures list 16,108³³ chickens which are located in proportion to the population.

Little need be said regarding ducks because they are so few in number that they play practically no part in the scheme of things. 1929 figures list a total of 667 head of³⁴ ducks.

In addition to the crops and animals already mentioned, there are many native trees that grow in the bush that are used for many purposes such as house building, canoe building, curio making, etc. However, these are allowed to

33. U. S. Dept. of Commerce, 15th Census, 12

34. Ibid.

propagate themselves, and no figures or estimate of their number or acres used can be given. At the present time no tree having possibilities as lumber in the world market is produced except a few teak (*Tectona grandis*) trees. About two hundred of these have been spread throughout American Samoa, and the Experimental Farm at Taputimu has many more for distribution, but there are no calls for them. Twenty years, which is about the time required for a Teak tree to be usable for best lumber, is too long a period in the conception of the Samoan to wait. However, this tree will grow where no other crop except bush will. This means that this area is producing nothing of value whereas it could.

3. Labor.

1930 figures list as gainful workers 2855 persons of whom 2489 were Polynesian and 184 mixed blood, others being naval personnel.³⁵ 1350 of the Polynesians and mixed were listed as farm foremen and laborers while 528 were listed as farmers, i.e. owners and tenants. This makes a total of 1878 out of 2489 which is 75 per cent of the total which is engaged in agriculture. Also, to go further, of these two classes there were only 3 individuals who were not Polynesians. Therefore, agriculture in American Samoa can be said to be carried on entirely by the Samoans themselves.

American Samoa then does not have a labor problem such as exists in Hawaii or even in Western Samoa. Labor is done

35. U. S. Dept. of Commerce, 15th Census, 7

by the native himself on land that is his or that of his family. It is more or less the same as the farmer in the United States. What he produces is for the benefit of himself and members of his family. He does not receive wages as such for his labor but does receive food, taxes, and care from his family group. In this sense he is an independent producer dependent solely on the feelings of his group toward himself.

The question as to whether the Samoan is a good laborer or not is one hard to answer. Looked at from the western viewpoint he is a very poor one. But if it is remembered that this is Samoa and not elsewhere a quite different idea results. He has no one else besides others of his own race with whom to compete; he need not exert himself beyond the amount that assures food, tax money, church dues, and a few other minor expenses; he is frowned upon by other members of the family group doing similar work if he does too much; he is very busy a great deal of the time preparing for or attending feasts; he would much rather be doing things in the village or with others, as the Samoan is very gregarious; he cannot accustom himself to sustained effort because he has accustomed himself in the other direction for possibly two thousand years; he (the laborer) is so few in number in proportion to the total population that he is doing as much as he can under the climatic conditions. The Samoan does the best he can if the things that bother him are considered as necessary. That is, he could stop having so many feasts or attending so many with a consequent

increase in labor. However, without this recreation he probably would lose interest in what he was doing with a consequent loss in output. There is room, however, for cutting down the great number of these events. Also, if more thought were put into the work accomplished or planned before its execution, the results would be amazing. The Samoan does as he sees others doing, as he saw his father doing and his father before him with the same implements and tools. He does not know why he does a thing in such a way; it is simply done that way.

The claim is often made that the Samoan is lazy, preferring to lie in his fale most of the time rather than getting out and working his land or fishing. This viewpoint is based on a comparison of the Samoan without duly considering his economic set-up with other races where life is competitive. A population of 1878 out of a total of 11,466 who are producing food and copra means that each one is producing food and copra for himself, as well as five others. This is almost the same proportion as obtains in the United States between agricultural producers and consumers, and there farming is done on a large scale with machinery that does the work of many men. No, the American Samoan for his country and amount of knowledge is a satisfactory laborer, providing the Islands are not commercialized. When and if that occurs, as witness Western Samoa, he falls by the wayside, and other people must be brought in. This has been demonstrated vividly in Hawaii with the

Hawaiians. When large scale or commercialized agriculture came to stay, labor had to be found elsewhere.

4. Implements or Equipment.

As has been mentioned earlier, the implements used by the Samoans in agricultural work are very few. The oso or pointed stick, the bush knife, the axe for tree felling and chopping, and sometimes a pick mattock. That is all. All work is done with these tools or the hands. A home-made instrument that is used for weeding in very rocky land or for corners of lawns is a strip, about $1\frac{1}{2}$ inches wide of corrugated iron roofing that has been straightened out and the last three inches bent over at right angles and sharpened on both sides. The length is about three feet. This is swung back and forth in one hand, clipping down weeds and grass. If a stone is struck, it simply dulls rather than breaks as a sickle would.

About the only equipment that is used are home-made coconut leaf baskets for carrying the food or copra from the plantation to the village. (See pictures in Appendix C). The baskets are hung on the ends of a carrying pole of Fau (Hau in Hawaii) or other wood which is about five feet long and about $1\frac{1}{2}$ inches to 2 inches in diameter.

Copra storehouses are to be found in most villages, constructed of coral blocks chinked with lime. The roof is corrugated iron sheets. These are for the storage of copra away from the rain while waiting to be transported to the dock at Pago Pago. (See pictures in Appendix C).

These items exhaust implements and equipment used in farming in American Samoa. They seem pitifully few, but with them all work is carried on and has been for countless years.

5. Fertilizing Practices.

It can be definitely said that no fertilizing is done in American Samoa. Commercial fertilizer is unknown and droppings from animals are allowed to remain where they fall, which too often is not where they are needed. There is a bat cave near Afono where it is estimated 300 tons of bat guano may be found, but this is not even used by the people of Afono. Nature has been so kind that as far as the Samoan is concerned there is no need for fertilizing. The rapid growth of vegetation, the great amount of rainfall with a consequent rapid decomposition has undoubtedly been the reason that the need has not been felt.

On Swains Island the husks from the coconut are spread over the areas beneath the coconut trees to a depth of as much as two feet to decompose and return to the soil a part at least, of the fertilizing ingredients that have gone into producing them. This same practice is not carried on in Tutuila or in the Manu'a group.

6. Rotation of Crops.

The only thing that is done that comes anywhere near to classifying under this heading is that taro is raised in one location for two or three crops and then a new location is chosen while the old is allowed to lie fallow until needed again, possibly not for four or five years. (See

picture in Appendix C). In a few instances also, banana locations are changed after a period of 10 or 15 years, but this is in very few instances. Outside of these two cases, there is no rotating of crops. Often a piece of land having a crop on it will be allowed to revert back to the original state because of the fact that it requires too much labor to maintain or that there is enough elsewhere which is more easily obtained.

7. Population Figures.

It will be unnecessary to go further back than 1900 for population figures as that will give us thirty-five years to show the trend.

<u>Year</u>	<u>Population</u>	<u>Source</u>
1900	5,499	Naval Census
1920	8,056	U. S. Census
1926	8,676	Naval Census *
1930	10,055	U. S. Census
1932-Dec. 31	10,562	Naval Census
1933 " "	10,843	Naval Census
1934 " "	11,151	Naval Census
1935 " "	11,466	Naval Census (36)

* Includes 227 whites.

This means that the population has a little better than doubled in thirty-five years. Whether it will double again in the next thirty-five or sooner is open to a great deal of conjecture. This would mean a population of approximately 23,000 in 1970. At any rate such a possibility

36. The first three totals quoted obtained from Keesing's Modern Samoa, 33. Other figures obtained from the records on file in the Attorney General's Office, U. S. Naval Station, Tutuila, American Samoa.

must be looked for with a consequent increase in food grown in order to take care of the people.

8. Area Used in the Production of Food.

As was explained earlier the coconut trees are not planted alone in groves but are mixed with other trees such as the breadfruit, bananas, native trees, as well as the smaller taro plants, yams, and laufala (pandanus). This makes it very difficult to give figure on areas used in the production of food and also cash crops.

It is estimated that 7778 acres are used in the pro-
³⁷duction of food. These acres are not all being used at their greatest efficiency at all times, but are worked on in greater or less degree from time to time. In this estimate allowance has been made for coconut trees necessary for the production of sufficient ripe nuts as food and green nuts for drinking.

9. Area Used in the Production of Cash Crops.

Cash crops in American Samoa are copra, and the production of pandanus and paper mulberry which are worked into mats and tapa and are sold for cash. The estimate of
³⁸this area is 3818 acres.

37. Estimate by the writer.

38. Estimate by the writer.

CHAPTER IV

SURVEY OF AGRICULTURAL POSSIBILITIES

1. Food Crops.

a. Vegetables.

At the present time there are a few places and people who are producing vegetables for use as food. These are the Experimental Farm at Taputimu, Mr. Frank Gurr at Maloata, and some of the schools. The vegetables raised on the Experimental Farm are sold to the people of the Naval Station. Those produced by Mr. Gurr are sold to the same people. Those produced on the school plantations are used by the teachers and children, as there is absolutely no sale for them.

Professor Carey D. Miller of the University of Hawaii, who spent two months in Samoa in 1935, found that the native Samoan diet was a balanced one. This is without vegetables of any sort as the Westerner thinks of vegetables. This means that the Samoan does not need Western vegetables in his diet, and there is then no necessity for using land and effort in producing them.

A Samoan will eat anything that is edible, but it is entirely a question of filling, rather than an acquired taste. If his diet is a balanced one, why should Westerners feel that vegetables need to be a part of the diet? More land would be needed to produce them and more intensive cultivation practiced. However, this is a thing to look

forward to in the future if conditions change, but at the present time the native food crops are in need of so much improvement that efforts should be placed on them. Later, if vegetable growing is needed or foreseen, efforts could then be spent on their production.

The Experimental Farm raises radishes, corn, string beans, tomatoes, and egg plant along with some fruits, but the quality of the product is not good. As mentioned earlier, no fertilizing is done, imported seed is often old, and some crops that only do well in cooler locations are raised. One cannot expect to obtain maximum crops under these conditions. It is recommended that either fertilizing be done, good seed of acclimated vegetables obtained, with the idea of producing these vegetables solely for the Naval Station, or else dispense with trying to raise vegetables on the Experimental Farm. In October of 1935 about twenty-five per cent of the annual expenditures was returned¹ to the Island Government in sales of vegetables. Better and cheaper vegetables can be imported from the mainland United States or Australia. Note: The above has changed entirely in the past few months as described in Chapter I, page 22.

1. Statement by P. A. E. Greenwell, Aide for Agriculture, Director of the Experimental Farm, October, 1935.

After two years of experience in Samoa having the schools produce vegetables in plantation work, it has been demonstrated that this should be dropped. In fact, it has been dropped, and all efforts placed on improving Samoan food crops.

b. Fruit.

Samoa should produce much more fruit than it does, not for export, but for food. Pineapples do well and could easily be produced in larger numbers. The planting material is good and the fruit excellent. The crowns should have the lower leaves trimmed off, and the raw butt stood upward and allowed to dry for three or four days before planting. This would reduce the heavy mortality and prevent many discouraging results. Areas that are close to the villages, and more or less neglected, could be used for this purpose. Three times the present production could be attained in this way with benefit to the diet.

Oranges should be raised in greater numbers. The demand is greater than the supply, so, many oranges each year are brought over from Western Samoa. The Samoan uses all that he raises, and would use many more if he could get them. The orange raised is similar to the Kona (Hawaii), orange but has fewer seeds. There are areas that could be planted to these trees. For instance, by planting one tree for each agricultural worker, the number would be 3958 trees instead of 2080. Using the same proportion per tree there would then be

a production of 518,498 oranges or 44.5 per individual.² As mentioned earlier, the juice of this fruit will help in the variation of the carbohydrate diet. How much better then that more fruit be available for use. Native stock is good, so no importation of different varieties is recommended at present.

Limes and lemons could be increased in numbers very easily. Excellent limes are produced in Samoa and it is a mistake that more are not produced. Here is a possibility for export as well as for local consumption. Inquiries have been made by California purchasers about limes in larger numbers so that a market could be built up. No great care is required in raising them which would take needed labor from other work. This possibility should be followed up soon and encouragement given in increasing the trees. Inasmuch as the limes are so good it is not recommended to stress any further increase in the number of lemon trees.

Papayas are somewhat of a sweet food. This probably is part explanation for no greater production than now obtains. However, this should not deter authorities or interested parties from stressing the use of this valuable food. It is so easily grown, with practically no labor, that many trees should be in or near the villages. Many of the digestive disorders would be greatly helped by the common use of this fruit. Because it is used for infants and elders may have

2. U. S. Dept. of Commerce, 15th Census, 11.

some psychological bearing on the matter of its use, but this attitude needs to be changed. Instead of a papaya per week, each individual should have three or four. This need will have to be taught by the schools and the Medical Department.

Mangoes play a small part in the Samoan diet. It is not recommended that the number of trees be greatly increased, but it is recommended that new varieties be introduced, such as the Pirie. This variety would soon become a favorite delicacy. Other varieties might also be introduced.

Avocado pears could be planted in greater numbers and more fruit obtained. As mentioned in Chapter III the Samoans are not especially fond of them. They eat them as a filler. The native avocado is excellent, being free of strings and of a good flavor. Due to this, as well as a lack of fondness of them, it is not recommended that new varieties be brought in.

Due to very high freight rates and a fondness for their use locally, it is not believed that bananas will ever become an export in American Samoa. It is safe to say that this will be true for several years to come. Also, it is not felt that there should be any extensive additional planting of this crop because the area of land available is limited. However, double the present crop can be obtained on the same acreage. Preparatory to planting, the soil should be cleaned of weeds and then loosened to a depth of two to three feet. The sucker, or shoot, should be planted in the soil about a foot and a half below the surface of the ground, in a hole,

or depression. This is to allow for raton suckering so that the whole plant does not too readily grow out of the ground. Otherwise the first heavy wind that occurs blows down the stalks that are bearing, or soon to bear, because there is no firm attachment to the soil, but only an attachment to the mother rooting system. Also, as the shoot grows, weeds should be kept down to give the plant sufficient sunlight and moisture. A still further improvement is that the bearing stalk be cut down when the bunch of fruit is removed, so that plant nutrients can be sent to the new or younger shoots that are growing. Not more than two suckers should be left for each stalk cut down after bearing, as greater numbers will result in smaller bunches.

No introduction of new varieties is recommended because many have been brought in, such as the Bluefield, the Apple Banana, and the Chinese Banana. Work should be done on the scale that attacks the bananas. A start has been made, but this work should be continued. Fertilization should be practiced as bananas are heavy feeders and drain much of the plant food out of the soil. Lack of plant food accounts for the many small, wizened bunches that are often found.

The number of breadfruit trees in American Samoa at the present time is sufficient for the population. As the population increases there will be greater need for more. This need not be done entirely by new plantings with the use of that much more area, but can be partly attained by fertilization. That will probably only come as a last resort so that more area in the meantime will have to be used. Another

method of getting more breadfruit from each tree is to do more towards keeping brush and undergrowth cleared away. Many vines, especially the mile-a-minute, should not be allowed to grow over the tree and cover the leaves, preventing them from being exposed to the sunlight. Careless injuries, allowing the entrance of fungous growth, should be eliminated. The root suckers should be planted deeper than they are, after better soil preparation, so that the tree will have a better root system to hold it in the ground during a hurricane.

c. Tuber.

Taro is the basic food. The taro plantations are given better care than any of the others. Better preparation of the soil in loosening it should be done, the planting should be deeper, and the shoot pressed in more. Otherwise the Samoan does well by his taro, as long as nothing unusual happens to it, but he is entirely at a loss if anything does. He has not thought of spraying for caterpillars that sometimes come in hordes and eat up all the taro leaves. When such happens there is a cluck of the tongue on the teeth and the belief that God must have wished to remind them of some sin. No fertilization is done, but the Samoan changes the location of the taro patch quite often. This is satisfactory for the present, but in the future when all taro land is producing, fertilization must be practiced. Rehabilitating old soil containing spores of Taro Rot must be done. This is a long time in the future, but methods must be taught now

to the younger generation. It can be depended upon that taro will be grown always as it is of such great importance in the life of the Samoan.

Sweet potato production should be encouraged. This is rather a hopeless task at present, but after the taste for sweet potatoes is acquired, it will be used extensively. All other Polynesian people use it in their diets. The reason it is suggested that it be encouraged is the fact that it will produce well, in spite of hurricanes when almost everything else may be ruined. Also, with a minimum of cultivation, it will supply a great deal of food on limited areas. In order to make much headway with this crop, some plan must be worked out to cut down the rat population, or to eradicate it. This may take the form of concentrated campaigns by all persons, dog gangs, traps, or poison. In Western Samoa a very successful phosphorus poison is used for this purpose. It should be used in American Samoa as soon as the people appreciate that they have a serious rat problem. This will only come when the people are educated to that extent. When one has the lack of desire to eat sweet potatoes plus the rat damage, the natural reaction is one of not being bothered. The Samoan is natural to say the least.

Nothing further will be said about yams, arrowroot, and tapioca because they are of very minor importance, and the people will produce them as needed.

d. Miscellaneous.

The use of rice as a supplementary food is on the increase. This is a result of acquiring a taste for it following past hurricanes, when it was issued to the people by the Naval authorities. It would be possible to produce rice in Samoa, but it requires such intensive cultivation that it is not recommended. It should be kept in mind for possible future use as a food crop, when the area will not support the total population under present production methods. It is recommended that a few varieties be imported from Java or India and grown at the experimental farm. Results obtained would point the way for later use.

Bread is being used more and more, especially by the people in the bay area and also at Leone. Within the last year, bakeries have been started at Ofu and Ta'u so in Manu'a the use of bread will increase. If this use continues, allowance will need to be made for the importation of flour, as it is impossible to raise wheat in Samoa. It would be an excellent thing if the Medical Department and the Department of Education could take measure to teach the people how to make sweet potato bread, breadfruit bread, or bread of some other crop produced locally. This would prevent the necessity of sending a great deal of local money to foreign places in order to purchase flour. This in itself is not a serious mistake, but the money is needed in Samoa for so many other things.

2. Cash Crops.

The problem of producing cash crops in a country or place, is always secondary to that of food. As pointed out in the previous chapter, there is sufficient food produced at the present time for the present population. Also, there is sufficient available land, if present methods of production are maintained, to take care of almost double the present population. The time that this will be true is rapidly approaching. This means that the problem of American Samoa is to teach the people how to produce sufficient food on limited areas in order to have available land for cash crops. Cash crops are necessary in order to obtain money for various purposes, some of which are already a part of the life of Samoa, and others that must be striven for, for the benefit of the people themselves.

a. Vegetable.

Sufficient has been said in the previous section of this chapter regarding vegetable crops to show that these will not within a generation become cash crops. In fact, it is hoped that they never will. With high freight rates, high costs of material, local transportation problems, and limited areas, it would not be profitable.

b. Fruit.

With fruit crops, more or less the same situation exists. These crops can, and should be increase, but with only the local needs in mind. Hawaii produces bananas for export to the west coast of the United States where she has

to meet the competition of the Central American countries. There might be room there for some Samoan trade, but with the freight rates, and ten days before reaching the market, it is a questionable undertaking. Western Samoa exports many thousand cases of bananas to New Zealand yearly, but there a prohibitive tariff would have to be met by the American product. The reason Western Samoa has built up this trade is due largely to the fact that in 1935, when the people of American Samoa were receiving \$1.40 per hundred pounds of copra, the Western Samoans were receiving seventy-eight cents.

Pineapples should be increased for food but not as a cash crop. There is insufficient land to conceive of pineapple plantations and the canning of fruit for export.

Papayas, mangoes, and oranges will never prove to be cash or export crops in American Samoa for the same reasons as outlined above. Limes, however, as mentioned earlier, might. A certain limited amount for export could be produced. Certain firms in California have already inquired about this product from which lime juice is extracted for use at soda fountains and for soda water. The possible fulfillment of this market is dependent upon the shipping qualities of the limes, freight rates, and also the area available for added trees. This crop is suggested with the idea that it can be built up as a cash crop in time.

c. Tubers.

The tuber crops, such as taro, sweet potatoes, yams, and tapioca, will never become cash crops. In the first place, what is meant by a cash crop in this thesis is an export crop. Considerable taro, yams, bananas, and breadfruit are sold on Fridays on the Naval Station Malae to the people of the bay area. (See picture in Appendix C). This is because in this area, usable land is limited, and many of the inhabitants work at the Naval Station so that they do not have time to produce their own food. This is quite a little business in itself, netting possibly a hundred and twenty-five dollars a week, but it is solely money earned locally on the Station and is not to be confused with foreign cash.

d. Trees.

This then brings us to the tree crops. It is seen that other crops are not, and probably will not within the next few years, become cash crops, therefore, it is entirely within the realm of tree crops that present and future crops must come.

The coconut was not mentioned in food crops because it comes both under that heading as well as that of a cash crop. It has been found in previous chapters that the Samoan obtains much food, shelter, drink, and a few household appliances from the coconut tree. It was found that 5,761,475 nuts were used for food and drink when the population was 10,055.³ This means 573 nuts per individual

3. See pages 61 and 63 of this thesis.

per year. At the average production per year of 50 nuts it takes 11.46 trees to supply the needs of each individual. Therefore, when the population becomes double what it is now, that is 23,000, there will have to be 263,580 trees for food alone, providing the production per tree remains the same. If the number of trees, 283,000, remained the same, there would then be only about 20,000 trees from which to obtain copra. From these trees possibly 150 tons could be made. This is far too small a production to bring in needed money. Therefore, either more trees must be planted to produce more copra, or better methods of production used. There is room for more coconut trees in American Samoa, but there is not enough for 200,000 more which would mean a yearly export of 1500 tons of copra. Something must be done to get better results from the present number of trees, and also to plant a possible additional 15,000 trees. What can be done to obtain better results from the same number of trees?

A. Seed Selection.

Nuts for planting should be selected while on the tree; a large nut, free of disease, having much meat, from a tree not too tall to facilitate climbing, and one of many nuts on the tree. The tree should be a dwarf one, possibly thirty feet tall at its greatest height. The nut, unhusked, should be about once and a half the size of a man's head and be one of about 80 or 90 in all stages of development on the tree. There are nuts and trees of this type in American Samoa, and their number should be increased.

B. Planting.

The nut should be ripe before removal from the tree, dried a few days, and planted out in a bed to hurry germination. It should then be planted in the bush after a large enough hole is made, and the area surrounding it softened as well as cleared of weeds. The nut should be placed about a foot below the surface to assure a deep root system for feeding and to hold on in hurricanes. Another point that needs much attention in Samoa is the distance between trees. Trees should never be closer than 30 feet in each direction.

C. Care of Trees.

After planting, the young trees should be watched from time to time. If the tree dies, a new one should immediately be placed there. Weed and vine growth should be kept away from the tree. When the tree is in its sixth year a piece of tin at least a foot in width and long enough to go around the tree should be nailed flat around the trunk about five feet above the ground. This is to prevent rats from going into the top of the tree and destroying a great percentage of the young nuts. They gnaw into these for the water and food in them. This ruins them and they drop off. This suggestion is made because there is no expense involved, whereas poison costs money. Also, no footholds should be cut into the trunks of the trees for climbing, as this weakens the tree, causing it to snap off in hurricanes, and allows fungous growth to start, as well as the coconut beetle.

D. Other Precautions.

More consistent and worthwhile efforts should be made to cut down the Coconut Beetle damage. Efforts on Wednesday mornings when the people are supposed to search for beetle larvae are half-hearted. Cases have been reported where the people have raised the beetle larvae in order to prove to the pulenu'u that they have searched for them. The plantations should be kept clean of old coconut stalks and stumps because this is a favorite breeding ground. In and around the ovens or umu, where much rubbish collects, is another. These areas should be thoroughly cleaned once a week to prevent the eggs from hatching and becoming beetles. Much could and should be done along these lines. No coconut stumps should be used for fence posts unless the bark is peeled off, because it is directly under the bark that the larvae spends its life and emerges as a mature beetle. Cut up coconut logs might be piled up in the plantations to serve as traps to be burned up every three weeks.

On an ordinary coconut tree, untouched by humans or heavy winds, there are from 24 to 26 leaves. As will be noticed in Appendix (B) coconut leaves in Samoa are used for many things. Being such a great part of the life of Samoa, these uses should be continued. Taking these uses as necessary, allowance must be made for them. Hundreds of trees with but ten or twelve leaves have been observed. This means that fifty per cent are cut off to be used for one purpose or another. This not only cuts down the leaf

area of the tree, which is very important, but also leaves a fresh cut that allows fungous to start into the tree. Not more than one or two leaves should be removed from any tree during a bearing year. This is the right thing to do, but the Samoan will not do it. Therefore one other suggestion is that certain trees near the village be used for leaf removal and do not expect any nuts from those trees as ripe nuts.

Green nuts are removed from trees for drinking purposes. These are broken off the tree without any regard for the break, which is often long and unnecessary. This allows fungous to start. Also, many of the flowers and forming nuts are damaged even knocked off in the process of getting drinking nuts. Care must be given at this time to prevent undue damage. It is realized that the Samoan will use nuts for drinking. Therefore he should get these nuts from the same trees from which he is taking his leaves. In this way all other trees will be left to produce ripe nuts.

Many of the coconut trees in Samoa are too old. The tree starts to bear at eight years of age, and by the time it is ten years old it is doing quite well. By the age of fifteen it is producing as well as it ever will. It should produce at this rate for a period of fifty or sixty years. However, in Samoa it is recommended that the average life of a tree be considered as fifty years. This means that when a tree is forty years old, a new one should be planted to replace it. This might be in between two others if they are

thirty feet apart. Then, when the old tree is fifty years old, it should be chopped down and destroyed. Many trees in Samoa are seventy and eighty years old and have long since passed their period of economical production. This figure was obtained by talking to chiefs of at least fifty years of age who stated that certain trees were heavy producers and full grown when they were small children. This is the only way to be certain of age because the people of Samoa do not know the ages of anything. Out of a group of one hundred people it is safe to say that not more than five or six know their own ages. This is even true of the youngsters in the schools.

The teak tree (*tectona grandis*), as mentioned earlier in this thesis, can be grown in American Samoa with very little care. It grows best in the medium elevations so it could be raised in the areas where there are now only wild trees, some of which are used by the natives in building, but most of which are used simply as firewood.

From past experience in Western Samoa the teak tree reaches a growth where it is usable as lumber when it is from twelve to twenty years of age. This lumber is very valuable and from estimates quoted on samples sent to San Francisco it should be a very profitable crop for Samoa. Prices quoted were two hundred dollars a thousand board feet and the wood considered better than teak from Java.⁴

4. Statement by F. L. A. Gotz, past manager of the New Zealand Reparations Estates in Western Samoa who forwarded the samples to San Francisco.

It is understood that Cuba has found the teak tree admirably adapted to its climate and is going into its production on rather a large scale. This, of course, will have a bearing on the value of the lumber, especially when there is such a long ocean voyage between American Samoa and San Francisco, as well as the high freight rates. However, it is fairly certain that if exports increase to any extent, the freight rates will be reduced in proportion.

It will probably be several years before Cuba becomes a heavy producer of teak and until that time American Samoa could benefit in this market. If Cuba then took over the total market for this wood there is always the possibility of creating a market in New Zealand and Australia. Also, this wood could be used for construction purposes in American Samoa. At the present time a great deal of breadfruit and coconut wood is used in the construction of the native fales. This means the destruction of these trees in order to get this lumber. Instead of using older trees that are past their best bearing, trees in their prime are selected. This loss could be stopped by the use of teak which would be stronger and would last longer.

As mentioned on page 40 there are 4618 acres available in American Samoa for tree crops. Insofar as this is not a huge area considered from a western viewpoint, it is believed wise to plant almost all of this area to teak. The culmination of this, however, is far in the future, because the Samoan moves slowly. Teak is a new crop, he does not

see the actual market, it means added exertion on his part to plant the trees, and twelve to twenty years is beyond comprehension.

Teak is a very likely possibility for future cash income, and encouragement in planting it should be continued, even if efforts to date have been more or less ignored. Western Samoa is ahead of American Samoa in realizing the future importance of this crop, and thousands of trees have been planted, but it is of interest here to point out that practically all of these have been planted by the European,⁵ rather than the Samoan.

Kapok (*Eriodendron anfractuosum*) grows well in American Samoa. It is to be found growing throughout the group, usually in or near the villages. The floss or kapok that is obtained from the pods (called cotton by the Samoan) is used in stuffing pillows. The pillow in Samoa is used extensively by the women and children as well as many of the men, although the old bamboo pillows are still used. No other use of the kapok is made because mattresses are not desired as yet. After a Samoan sleeps on an American bed with springs and mattress his joints ache just as the American does if he sleeps on the Samoan bed of mats. However, as time goes on the Samoan will probably adopt a sort of mattress made of kapok. This is entirely practicable because

5. Statement by Secretary of Native Affairs for Western Samoa, July, 1935.

sufficient kapok for this use can be raised. More trees would have to be planted, but this could easily be done, and there is ample room for them. This crop probably will never become a cash crop for export. There is insufficient land areas to produce this crop in export amounts, and even if there were, the native would not do it because it requires such a great deal of labor.

The Macadamia Nut (*Macadamia ternifolia*) grows fairly well in American Samoa. Several seeds have been brought in from Hawaii and planted at the experimental farm as well as on the Naval Station. All of these have germinated well and are growing nicely. However, these are all much too young to bear as yet, so it is still too early to state how they will produce. From all appearances, however, they should do fairly well. After attaining a growth of two feet, very little effort would be needed except keeping weed growth from choking them out. The great amount of labor in harvesting the nuts, sacking, and shipping will probably prevent the macadamia nut from ever becoming a cash crop. However, more trees should be planted so that if it is ever found to have cash crop potentialities production could easily be stepped up from seeds produced locally.

Cacao (*Theobroma cacao*), or chocolate tree, is grown in Western Samoa quite extensively along the north coast of Upolu. This has been developed with foreign capital and on large scale holdings. The Samoan has not gone into it on his own and, as Keesing points out, at least for the present

this industry should continue to engage the attention of private non-native planters.⁶ If this holds true for Western Samoa how much more so for American Samoa with so much less land. Another point is that in American Samoa⁷ no foreigner can own land so the cacao production in American Samoa is therefore eliminated. Even if this were not true the immense amount of labor necessary in planting, cultivating, and preparing the beans for sale, as well as the great amount of rat damage, would preclude it. As long as the Samoans are as they are, that is, fairly busy producing food, they will not go into cacao production. Another factor that should be mentioned is that cacao does better in areas receiving less rainfall than in American Samoa.

Coffee (*Coffea arabica*), is produced on a few trees in American Samoa. It is of a fair flavor and size, but the production is small. There is too much rainfall with accompanying cloudy weather to make this crop worthwhile for export. The production of coffee for home consumption is something that should be done in the future. Any greater production than that is not recommended as here again the great amount of hand labor necessary makes it undesirable to the Samoan temperament.

6. Modern Samoa, 312.

7. Keesing, Modern Samoa, 266.

Paper mulberry (*Broussonetia papyrifera*), is planted in small amounts for use in making tapa. The planting and cultivation is usually done by the women. They also cut it, remove the bark, soak it and make the tapa. Tapa cloths are⁸ exported in large quantities. They are made from the paper mulberry only, so having sufficient trees is a necessity. This trade is growing, and it will be necessary for the Samoan to increase the area in paper mulberry at once.

Pandanus (*Pandanus Leram*), is raised usually around the fales in the villages or in the outskirts of the villages. The leaves are used for weaving the floor mats that are ex-⁹ported. Export trade in mats is a growing one, and it is necessary for the Samoan to enlarge the pandanus plantings at once to prepare for further growth. Ample area for this increased production is to be found without cutting down the area in food crops.

3. Animals and Products.

Hogs are and will be raised in Samoa for local consumption only. They use far too much food and land to ever become a source of pork export. Being acclimated to Samoa it is not recommended to do away with the present stock for pure breeds. Sufficient animals are produced for all needs, in fact, it would be better for the Samoan if he ate less

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8. The Department of Native Industries at Pago Pago export on an average of 300 tapa cloths a month. This figure furnished by Chief Storekeeper, Naval Station, Tutuila.
 9. The above department exports an average of \$600 worth of mats a month. Figure furnished by Chief Storekeeper, Naval Station, Tutuila.

pork. In a warm climate an energy producing food, such as this needs to be eaten sparingly. The presence of large boils on so many adults is due to the excessive use of pork. At least fifteen teachers have been laid up from time to time because of immense boils. Upon following advice to quit eating pork, the boils stopped, and there was no recurrence until pork was again used. More advice of the same nature again caused a clearing up, but the Samoan will always start his pork consumption again when he has forgotten past attacks of boils. It is hoped that this definite demonstration will show them in the future what should be done, but even that is open to question.

One recommendation that should be made is that more prolific boars be imported. The litters, being rather small, necessitates the presence of more sows than would be necessary if the litters were larger. This would cut down on the food consumed which is usually ripe coconut meat. Also, the sows are bred too early in life, which stunts their growth and is a factor in the small litters. The boars should not run with the breeding sows and young stock. Still another thing that needs to be done is to have more boars. There are too few boars for the number of breeding sows.

It would be a mistake to encourage the raising of dairy cattle and the wholesale use of fresh milk by the Samoans. There is insufficient land for the production of forage grasses, areas in food crops or pasture lands would have to be fenced, and then there is always the danger of contamination, especially in a warm and humid climate.

Refrigeration would have to be obtained in some manner which in itself is a very large expense. As has been mentioned earlier, the diet of the Samoan is complete, so why impose something foreign because westerners or Europeans find it a necessity?

The claim is often made that milk is to be had in Western Samoa so why shouldn't it be in American Samoa. It is true that it can be had there, but it is produced by cattle on coconut plantations that are controlled and operated by Europeans for European consumption. The Samoan himself, even in Western Samoa, is not interested in milk.

For the present then, and until such time as dairying can be taught to the people so that precautionary measures can be taken to prevent diseases and contamination due to milk handling, it is recommended that the building up of dairy herds and milk production be omitted. This endeavor must come from others who know what to do, providing the time comes that there is a need for it. At present there is no such need.

Poultry and poultry products have much more potentialities than dairy cattle and dairy products. The reason that chickens are raised is for their use as meat. The reason eggs do not play a larger part in the diet is the fact that few are laid and still fewer found. Pure-bred cockerels of the Rhode Island Red or Plymouth Rock breeds should be imported to improve local stock in meat and egg production. This is recommended because the Samoan will not spend the money to import both cockerels and pullets, and also the

local birds are acclimated to Samoa, and very hardy. By the importation of these dual-purpose cockerels, a bird with better and more meat as well as more eggs will be obtained. Present feeding practices will probably continue on the whole unless outside interests, meaning the European, demonstrates directly how other foods are superior and can prove that they are economical. However, this should not be expected for a long time to come. Better housing should be provided, and the birds trained to lay where eggs can be retrieved. The number of birds should be increased greatly. This could be done without much difficulty. However, all of this change will probably not result unless taught or demonstrated. This is true though for any change in American Samoa because the Samoan is very conservative.

Ducks and geese will never become of any importance in Samoa. It is recommended that nothing be done about them because the Samoan prefers chicken, and the ducks and geese use so much more food for the results obtained.

It is very questionable if the number of horses and asses should be increased. The district where most of the present ones are located is flat, and they are of benefit in transporting food and copra from the plantations to the village, and from the village to the copra sheds. Possibly a few more could be used in this area but for other areas it is not recommended. All villages not having roads and bus connections have copra sheds situated near the beach and the copra is picked up by freight boats and transported to the

wharf at Pago Pago, for shipment to San Francisco. Trails leading through the plantations and overland to other villages were made for man and are not suitable for animal transportation. They could be fixed for this purpose, however, and the use of animals would ease the burden of cartage a great deal, but this is something for the future. Forage grasses with more food nutriment would need to be imported because the Samoan does not feed his animals anything but grass. However, this could be taught, but having so little available land, it is very doubtful if it is ever done.

In the annual report of the Public Health Officer ending June, 1934, the statement is made that a herd of milk goats free from undulant fever should be imported to provide a supply of milk for infant feeding. Also the statement is made that goats will not eat taro.¹⁰ It is true that the goats will not eat taro, but they will eat sugar cane, copra, and breadfruit, but their greatest damage would be in ringbarking the trees of the islands. They would also destroy grass and other plant growth, and in a place such as American Samoa where the land is so much on end, and there is so much rainfall, this would be suicidal. Erosion would start and soon there would be no soil left for plant growth. Hawaii certainly has had sufficient

10. Stephenson, Annual Report of Medical Department to the governor, 1934, 168

experience with the goat to know that they are a serious problem in the watersheds of the islands. If the goats were penned so they could not roam at will, this would be a good source of milk, but it is doubtful if the Samoan would pen them up. A trial of a few goats well penned and cared for at the Samoan hospital would definitely demonstrate further moves.

4. Maintaining Soil Fertility.

No attempts have been observed in American Samoa to grow leguminous cover crops, and no records have been found stating whether they have ever been tried on a large scale. In Western Samoa the Dadap (*Erythrina lighosperma*) is used between the cacao trees, but this was the only attempt observed in Samoa for cover cropping with a leguminous plant.

Due to the climate, growth, death, and decay of vegetable matter is extremely rapid in Samoa. It is probably due to this that Samoa has been able to go on and produce crops as she has. However, this will not continue forever because as the population increases, more and more land will be used continuously for food. In that case, areas will not be fallowed as they now are which assures further usefulness without aid.

Dadap is not recommended as a cover crop for future use in American Samoa, but Pigeon Peas (*Cajanus indicus*) is. These grow rapidly in Samoa on all types of soil and in addition to adding nitrogen to the soil they can be used as food. A few bushes were growing at the experimental farm

until about a year ago, and these definitely demonstrated that pigeon peas will do very well. Growth was much more rapid than in Hawaii, in fact, it was because of this factor that they were removed. This was a mistake.

Pigeon Peas are easily planted by seed. These could be strewn around under the food trees without any labor to speak of. This factor is very important in Samoa. Many of the seed would not become bushes due to the great amount of weed growth which would cause choking, but enough would to make it worthwhile. As stated previously these bushes would add nitrogen to the soil and also be an added food to the diet. The Samoan would soon consider the Pigeon Pea a fine food. A vegetable protein food such as this is needed in the Samoan diet because at present the only protein food that he has is meat. Therefore, it is strongly recommended that pigeon peas be spread over the islands to serve this two-fold purpose. Pigeon Peas should at least be the first attempted crop because if one is chosen that is solely for nitrogenous addition to the soil it is doomed to failure from the start. This is something to be worked up to through the schools and adult education, but that will require several years which is too long to wait. Here are pigeon peas serving two purposes. The nitrogenous factor can be kept in the background at first, but the food factor stressed until the people are ready to profit by the former. Benefits as hog feed later on should also be pointed out, but not until the people have started to use them.

No fertilizing is done in American Samoa. The need has not been felt for it, and the people do not know anything about it. In many conferences with chiefs, a person who knows what fertilizer is, either commercial, bird, or animal is yet to be found. Even if he did he would not purchase commercial fertilizer because that costs money, and when a new item of expense is mentioned the Samoan shies off. This attitude though will probably change through the years, but it is paramount at present, and will remain so for a long time. Education alone can change this, and that is a slow process.

In Western Samoa herds of cattle are pastured in the coconut groves to keep down weed growth and to fertilize the soil. These cattle, however, are on plantations operated by Europeans. These plantations are coconut trees only, planted in even rows and extending for great distances. On Samoan holdings much the same picture that obtains in American Samoa is to be found. Coconut trees are here, there, and yon, mixed in with taro, breadfruit, and bananas which immediately precludes cattle. In American Samoa, the land is so steep and broken in most places that cattle are not recommended for use as on the plantations of Western Samoa.

This brings us then as to what is best to be done. Two possibilities present themselves; first, the planting of pigeon peas as suggested earlier and second, the use of compost beds. In and around the villages many leaves, branches,

and limbs fall daily. These could be gathered and placed in compost holes to decay and form humus. This could then be applied where needed. Care would have to be exercised not to form a natural breeding place for the coconut beetle. This might be prevented by the use of lime which could easily be made out of coral limestone that is found in most localities of the islands. This use of compost beds is recommended for adoption if and when it can be done. It will entail labor and a new conception of agriculture. It will not be done by talking about it once, twice, or a hundred times. It will be done only when the people are educated to the point of seeing its value and necessity. This mean that it will have to be demonstrated by the schools and other agencies interested in agriculture.

No further comment is made on commercial fertilizer because its use is probably so remote that what could be said would probably be forgotten before that time comes. Its use will come when necessity demands it, and education should start preparing for that day now.

5. Marketing.

Marketing means the advantageous sale of crops produced. This then becomes the sale of cash crops because crops raised for food are used by the people at home without recourse to selling except a little at the Naval Station to employees there. Outside of this item then, marketing will embrace the sale of cash crops.

As pointed out in this thesis, cash crops are and possibly will be copra, teak wood, macadamia nuts, and limes. It will be noted that all of these are tree crops.

The copra crop is handled by the government of American Samoa. At the Annual Fono, which is held in November, the Fono is asked by the Governor if they wish the government to handle the copra crop the year following. Ever since 1903¹¹ this question has been answered in the affirmative. Therefore, the government estimates the possible production for the year and calls for bids on the total crop. These bids are opened annually about the first of February, and the contract given to the highest bidder. Naturally the reliability of the bidder is checked carefully. These bids are opened by the Attorney General in the presence of the Governor and several representative chiefs of different districts.

The crop is handled through the Copra Fund, administered by the Attorney General. The producer is paid when his dried copra is received from money in the Copra Fund, and all incidental expenses including transportation from the field to the central copra shed at the Naval Station, handling at the shed, loading of the copra on the vessel, are also paid from this fund. This fund is derived from the payment by the contractor for the year's contract, which in February, 1936, was paid in full as soon as the contract

11. Keesing, Modern Samoa, 338

was signed. When the producer is paid for his copra at the copra shed he is given a copra chit, which this year is based on \$1.55 per 100 pounds of copra. The contract price is \$2.15 per hundred pounds. The balance or sixty cents per hundred pounds is used for the handling and marketing. At the end of the year any surplus is returned to the producer.¹²

Benefits to the Samoan are many. He has no worry about the copra after he delivers it to the copra shed, he receives cash for it in the form of a copra chit which is accepted as money anywhere in American Samoa, and he receives a much better price for his copra when all the copra is marketed to one firm. The reason the government markets the crop is to obtain for the people a better price as well as to make the marketing of it simple enough for them to make it. If in addition to producing it the Samoan had to market it he probably would not produce it.

What has been said about the marketing of copra might be said about the other cash crops. As these increase in importance, the government should market them for the people in the same manner. This should be done at least until they are on a firm footing. From present conditions this system of marketing should probably hold true for all time. or until such time as the Samoan has been taught cooperation in marketing.

12. Keesing, Modern Samoa, 341.

The marketing of foodstuffs at the Naval Station, to Station employees has already been described briefly. Friday of each week is market day there when many baskets of bananas, taro, breadfruit, coconuts, and yams are brought in and sold directly from producer to consumer. Prices are more or less set by the Attorney General, who places a fair value on these items, and periodical checks are made to see that they are being adhered to. This prevents profiteering, and it is recommended that it be continued.

CHAPTER V.

ECONOMIC INFLUENCES ON AGRICULTURE

1. The Matai, Economics, and Agriculture.

In Samoan life the matai or chief is the central figure. He is much more than the father of a family in the sense of father in western culture. He is that, and much more.

According to the figures quoted by Keesing which still hold true¹ there are approximately 450 matai in American Samoa. Using the figures listed in the 15th Census there were 4,541 Polynesian males in 1930. Going further there were 2026 males over 21 years of age.² It is impossible to hold a title before this age because usually titles are not bestowed before a male is at least twenty-four or twenty-five years of age, but more often thirty. Therefore, 450 matai out of a possible group of males of 2026 is the result. With the present population of approximately 11,500, each matai on the average is the leader or father of 24 persons.

Soon after a matai passes away, adult members of the family group gather in conference to select a successor. Often there are several claimants to the title and it becomes quite a task for the conference to agree. When agreement is not reached it is taken to the court for settlement. In the

1. Modern Samoa. 246.

2. U. S. Dept. of Commerce, 15th Census, 5.

last two decades disagreement has caused from 50 to 75 percent³ of the titles to be brought to court for settlement. In the old days these matters were handled in fono or conference, which sometimes lasted for several days until unanimous agreement was reached.

Due to the influence of American justice the person selected for the title is often the blood son of the previous title holder. This is especially true of the high chief titles. In the old days any member of the family was eligible for the title, the person chosen being ordinarily the one best fitted for the place. The change that has occurred has been detrimental to the best interests of Samoa in that often the best man is overlooked. Also, the one who is better equipped for the place may be resentful of being passed over and too often this resentment shows itself in an open disregard for the whole matai system.

The matai then, is chosen by the family (all relatives of the deceased matai, both by blood and adoption) to represent it. He holds the pule or authority over the family lands, he represents the family in the village gathering or fono of other matai, he represents the family in its connection with the officials, both native and island government. He is responsible for dividing up the family lands if necessary for the best interests of the individual members. It is his duty to see that the members produce suf-

3. Keesing, Modern Samoa, 246.

ficient food for themselves, also to produce enough of a cash product to take care of taxes, clothing, and church dues. In addition to these there is the necessity which has grown up of providing surplus food and fine mats for ceremonial occasions to maintain the honor of his family. Doing this enhances the importance of the title itself and the holder of the title as well. Too often this part of the duties of the matai has taken up his time with a consequent loss of supervision of the other duties. This duty or responsibility satisfies the vanity of the title holder and the family but economically it is a severe drain on the village and the members themselves.

With all of its shortcomings, the matai system is the best for the Samoan. The members of the family represented by the matai are protected from discrimination by other family groups, they ordinarily have sufficient food, clothing, and shelter, and on the whole have sufficient to pay for necessary cash expenditures. In times of sickness or infirmity, they are provided for, and they can always call on the family in time of need. This is shown by the absence of starvation or poverty. Each member of the family has certain duties to perform and when those are done there is ample time for fun and frolic. No exacting requirements are made of them by the matai that prevents a happy home life.

The greatest responsibility of the matai is the economic welfare of his family group. As stated above this has many ramifications. To understand it, it will be taken up in

terms of the past, the present, and the probable future.

Up until the time of the entry of the United States into American Samoa the matai system and the economic welfare of the people were pretty well fixed. The population was small: there was sufficient land for the production of food for the population; there were no taxes in terms of cash; there was no necessity for much money for the purchase of cloth for lavalavas, dresses and shirts: there was no necessity for much money for the purchase of imported foods as this desire had not grown up as yet: however, there was need for some money for church dues. The matai of the family was the real head of the group and he had ample time to supervise the production of food and otherwise look after the welfare of the members. He naturally owed help to the higher chiefs of counties or other divisions in time of warfare, which was a common occurrence, but there was still sufficient time to see that his family group was well cared for. Having only the food problem and a small amount of money to raise, it did not require a great deal of effort, or time, on his part. Due to this factor the ceremonial affairs of the family and the building up of the prestige of his title took on added significance. This was entered into with alacrity by the members of the family because it provided much enjoyment and frequent journeys or malaga on their part. Therefore, it cannot be said that the matai were the ones that forced this ceremonial life upon the rest of the people. They also, were a part and parcel of it.

Through the years since the entry of the United States, many changes have occurred. The population has doubled; much more land has had to be put under cultivation to feed the people; taxes to run the government have been imposed in the form of cash; justice in the courts costs money, such as \$25.00 for a divorce, alimony from \$3.00 to \$15.00 per month and miscellaneous small fines for assault and battery: a charge to register a matai title has been made a law; purchased cloth for lavalava, dresses, and shirts have become the rule rather than the exception; and imported foods are being used in the diet in ever increasing amounts.

Going back to page 9 in the first chapter it is found that a yearly allowance of \$202,252.00 is necessary to maintain American Samoa, that is, the expenditures of the Samoans. This figure as stated earlier includes necessities as well as luxuries but it has also been shown that the luxuries have become a very vital part of the life in Samoa. This means that with a population of 11,466 the average expenditure is \$17.64 for each individual man, woman, and child. When it is considered that in 1900 with a population of 5,499 and an annual expenditure per person of about \$3.00 the annual amount of money needed was approximately \$16,497.00.

The income from copra in 1901 was \$7,582.65. At that time there was an expenditure of \$16,497.00 for the islands. This means a difference of \$8,914.35 which had to be raised in some other way such as the making and sale of mats,

tapa, and the calling on the salaries of members of the Fita Fita, house servants, and Naval Station employees.

Since 1930, which was the last normal year as far as copra production and income is concerned, production has dropped off tremendously until the year 1935. This is partly due to the effects of the 1931 hurricane, but mostly due to a low price for copra. The income for 1930 from copra was \$135,027.94. At that time the population was smaller, less imported food was used than at present, and less income was derived from mats, curios, and tapa. Estimating an average annual expenditure per person (for 10,000) at that time of \$14.00, the total is \$140,000.00. With an income then of \$135,027.94 from copra and an estimated income of \$10,000 from mats, curios, and tapa, it is to be seen that there is a surplus of income over expenditures of some \$5,000. At that time, however, copra was selling at a price of \$83.40 per ton which is exceptionally good. From all appearances at the present time, unless we should break out in some area involving several nations, an average figure for several years to come would be about \$50.00 per ton.

The above definitely shows the different economic conditions that obtain now and those that obtained about 1900. So many changes have occurred so rapidly that the matai have been more or less lost. Many years of good copra production at high prices made money flow rather freely. New churches were built; some natives bought automobiles; many bought bicycles; lighter and more artistic lavalavas were purchased

rather than being made from laboriously prepared siapo; rice flour, canned fish, canned meat, and sugar were tried and relished, being new and marking the individual using them as one who could eat like a white person or pa'apalagi. After a few years of these things they came to be looked upon as more or less necessities, especially by the children growing up in a family having them. In good years the individuals receiving salaries were able to spend all or almost all the money received on themselves and their immediate families because relatives also were able to have what they wanted from the copra income. The matai were sucked into this rapid movement along with their family group and everything appeared beautiful. So long as an ordinary production of copra was maintained in addition to the production of food all wants could be supplied. No future concern of any sort was shown or expressed by the matai. They had ample time for leisure and ceremonial activities.

Then came the depression starting in 1931 with a drop in the copra price of \$33.25 per ton to \$50.15. Only 356.81 tons of copra were produced for the year, but this was due to the hurricane early in the year. The year 1932 showed a production of 602.30 tons but a still further reduction in the value per ton of about \$20.00. In 1933 and 1934 copra had to be sold on consignment as no dealer would contract for it. This means then that for a period of four years (1931-1934 inclusive) the average annual income from copra was \$1',470.40 instead of the previous ten year average of \$114,609.24, a difference of almost \$100,000.00 a year.

This is why native industries, such as mat making, tapa. and curio making moved ahead by leaps and bounds. Here was a ready market for the materials at hand because the government pushed the trade in Hawaii and in the mainland United States. A good price was received for the materials produced instead of a low price as was true of copra. It also gave the producer an opportunity to come to the Station malae on boat days to sell, something that every Samoan dearly loves as he sees the boat, the people, their clothes, their hair, and hears them talk. One is unable on boat day to purchase these same materials a few miles from the malae even when offering the same price. The things are taken to the malae for sale and if they are sold beforehand there would be no reason to go to see the sights.

Many of these articles are made by the matai as they hold their meetings in their villages. It is interesting work and especially so when it can be done as other matters are going on.

So it is seen that in the past four or five years, the economic conditions have changed tremendously. This naturally reflects back on the matai because he is responsible for the welfare of his family group. He knows very well that there is not as much money coming in to the family from copra as previously. He knows that more money is coming in from Samoan artifacts, but the income is still far below what it was up until 1930. The habits of his family group are much

the same as in prosperous years and consequently, need more money than the copra and artifacts income to fulfill them. He has been unable to impress his group with the necessity of producing more copra than they do, in fact, he usually thinks that what they produce is all that is capable of being produced. What happens then is that the family members get the necessary money themselves because the matai so often cannot. This money, or what it will buy, is usually obtained from working individuals on the Naval Station, active and retired Fita Fita members, teachers, nurses, and household servants. As mentioned in Chapter I on page 24, fifty percent of the earnings of working individuals is turned over to aigas.

In 1935 the direct income from copra was \$50,198.54.⁴ This and other forms of income outside of salaries make a total for American Samoa of \$75,527.22.⁵ The difference between this income and the expenditure of \$202,252.00 is \$126,724.78. There are no other forms of income from which to obtain this difference than the salaries of working individuals. In American Samoa, 640 individuals received \$210,728.57 during 1935.⁶ This is an average of \$329.26 each. This means that 10,826 individuals received \$75,527.22 or an average of \$6.99 each. As pointed out

4. See Table I, page 5 of this thesis.
 5. Ibid.
 6. Ibid.

above, the average annual expenditure per individual is \$17.64. A small group receives much more than sufficient for expenditures while the vast majority receives much less.

Taking fifty percent of the total salaries in the islands it is seen that \$105,364.28 is the result. The difference between this and the expenditures of \$126,724.78 is \$21,360.50. This difference is made up in the expenditures of the American sailors attached to the Naval Station who help individuals and families throughout the islands.

The working individuals still have quite a surplus over expenditures even after giving 50 percent of their income to aiga. This money is used in purchasing goods from Montgomery Ward and Sears, Roebuck, as well as providing accounts in the Bank of American Samoa. These accounts for the past few years are as follows:

1930	\$74,117.04
1931	94,663.12
1932	93,790.27
1933	67,464.72
1934	70,463.55
1935	76,789.01 (7)

Having such a group of earning individuals who must give up so much of their earnings to the welfare of their aigas the reaction has been to feel some resentment toward the whole system and to the matai who are supposed to be responsible for this welfare. Coupled with this is the

7. Figures obtained from Annual Reports of the Cashier of the Bank of American Samoa to the Governor.

matai family group, the members of which have had to rustle and obtain money on their own. They have then become somewhat independent rather than leaning on their matai. It is these factors, rather than a knowledge of English and broader interests that is jeopardizing the matai system. In other words, the matai have not kept up with their groups. They have brought present conditions on themselves.

What the future holds in store for Samoa can only be surmised. However, it can be quite definitely stated that wants and desires will increase rather than decrease. The increasing number of part Samoan children growing up will have a decided influence on the wants and desires of the future. Also, the children growing up now in homes using imported goods will consider them a necessity and will reach out for more if it is humanly possible. The large group of individuals that are influenced by the Fita Fita Guard will also play a large part in this change. Coming from all parts of American Samoa, becoming acquainted with certain palapalagi foods and customs, and then returning upon retirement to their homes, they are bound to influence wants and desires of the future. Especially so when they have the finances to satisfy these wants and desires.

With an increase in wants and desires then, and an increased population, what is to be done? All or almost all available positions are filled, and from appearances very few if any new positions will be created. an average annual selling price of copra over the years has been

established and artifacts can only supply the demand. These sources of income will not nearly supply sufficient funds to finance the wants and desires of the future. Instead of a yearly expenditure per person or need of \$17.64 the amount may easily increase to twenty or twenty-four dollars. Along with this, the salaried individuals are not from present signs going to continue to finance their aiga to such an extent as at present. This brings the matter then to whether the matai system must go as being obsolete or incapable of meeting future needs, or whether it can be changed to meet future conditions.

As already stated, as far as can be seen at present, the matai system is the best for Samoa. And yet it has proven itself in the last few years incapable of carrying on as it should for its own preservation. This means that if it is to be maintained it must be given a helping hand. Some way has to be worked out so that the matai once again will be the leader of his group. This help will have to be the development of further cash income, because outside of this factor the system is still functioning smoothly.

It has already been pointed out that all available positions are filled at the Naval Station, the Fita Fita Guard is overmanned, and the number of teachers will probably remain more or less stationary for several years to come. Pan American Airways may come in with some financial return to the Samoans in the form of wages, but this will not be much. Other outside interests will not

come in because there is no need for them. In other words, the only thing that can be looked toward to provide added finances needed is agriculture. If aid in developing this is given the matai, the matai system will endure; if it is not, the system will fail.

2. The Part Government Plays.

The Government of American Samoa is a Naval one, altered somewhat by conditions to suit the Samoan atmosphere. The Navy did not come in and completely superimpose a Naval Government per se. Keesing in his book "Modern Samoa" gives a concise and clear picture of the present Government of American Samoa so it will be unnecessary to give it here.⁸ However, section 3 of the American Samoan Code, "Form of Government" dealing with a basis of native policy as given by Keesing is needed here to explain the changes made by the Naval Government to fit local conditions. "The customs of the Samoans, not in conflict with the laws of the United States concerning American Samoa shall be preserved, unless otherwise requested by the representatives of the people."⁹

The above quotation makes it a definite policy of the government to maintain the customs of Samoa as much as possible. This policy, let it be said, has been carried out very well. American Samoa is still Samoan after thirty-five years of control by the United States. It is quite a

8. Keesing, Modern Samoa, 202-203.

9. Keesing, Modern Samoa, 201-203.

record to come into a foreign land, set up a government and maintain it for this period of time and still have the customs little altered. It certainly reflects on the broad-mindedness of the individuals who have had a part in it.

The Government has done nothing to break down the matai system, in fact, they have done much to strengthen it. By the appointment of District Governors, County Chiefs and Pulenu's it has worked hand in hand with the system because these individuals are always matai and this selection has enhanced their positions in the community. By also having the Annual Fono meet with the Governor to act as his advisor, the chiefs have quite a little power in the Government itself. The individuals selected as members of this Fono are always matai or Faifeau (Pastor) who are looked upon all over Samoa with the same respect as matai. Whenever any change in plans or contracts are made, they are usually discussed by the officials with representative matai. Often this is an exasperatingly long process but it has been done and from all appearances will continue to be done. It has made for little change in customs and setup through the years.

There is so little land available for cultivation in American Samoa when compared to Western Samoa and other places that no importation of labor has been considered necessary. Chinese were imported in western Samoa to cultivate the coconut, cacao, and rubber plantations. It could have been done on a much smaller scale in American Samoa but it was not, the government feeling that slower growth based

on local labor and talent would be more beneficial in the long run. This explains why foreigners are not encouraged to come to American Samoa to settle; in fact, they are frowned upon. American Samoa is being kept for the Samoans.

According to census figures of 1930, outside of the Polynesians listed which can all be classed for this study as Samoans, there were 366 individuals, being mixed Samoans 184, white 165, and other colored 17. The mixed Samoans were born in Samoa and are a local part of the life. Of the 165 white, 159 were Naval officers and men, Navy nurses, Island Government officials, clergymen, and teachers. The six others were retired navy men who married and settled and were working at the Naval Station, or were merchants and bookkeepers and dealers with but two listed as farm laborers and owners.¹⁰ The same picture holds true today. This means that 3.18 percent are others than Polynesian and of this 1.11 percent are navy and Island Government individuals stationed in Samoa for eighteen months or two years at the most. American Samoa has definitely been kept for the Samoan.

The statement is often made by uninformed newcomers to Samoa that Chinese or Japanese should be brought in to put under intense cultivation the many areas that are little used, or not used at all. They would have all areas producing at a hundred percent, vegetables and food that the

10. U.S.Dept. of Commerce, 15th Census, 7.

white man eats and not the Samoan. No thought is given to the future of Samoa, only a "pepped-up" desire to show the Samoans how to produce. In all countries where something similar has been done failure has resulted. Witness Hawaii, for example. Has agriculture as it is practiced here made the Hawaiian yearn to do likewise? The Hawaiian Homes Rehabilitation project on Molokai has demonstrated this not to be true as yet. It is a slower, more patient growth, that will be the most lasting one.

The United States Navy has done a very good job of handling American Samoa. All governors have been fair and broadminded individuals who have had the welfare of the Samoan people at heart. The same is true for the officers and men of the Navy and Island Government. If any criticism was to be offered it would have to be that the Government has been too kindly on the whole.

This kindness has taken the form of paternalism. An attitude on the part of the Samoan has grown up that whenever he is in trouble the Government or the authorities will provide a cure. Following several hurricanes, doing more or less damage, the Government has taken measures to relieve the distress of a shortage of food.¹¹ This was in the form of direct grants of funds by Congress and contributions by the Red Cross to purchase food. This in itself is praiseworthy but the resulting effect upon the Samoan

11. Keesing, Modern Samoa, 343.

has been just the opposite. He pictures the United States as a father to go to whenever he is in trouble, whether he is in great need or not. When called on to do needed road work to repay a part of this aid for food he has done so with alacrity but at the same time has not continued copra production at all, just storing up a continuous need for aid.¹²

A week after the hurricane of January 16, 1936, a visit was made to the western district of Tutuila to survey the damage done there. Practically all of the banana trees were blown over, a few coconut trees were down and the balance rather badly whipped by the wind, but the taro plantations seemed to be in good shape. There seemed to be no immediate need for worry but in two villages different persons wanted to know when the Government food was to be sent to them. In other words, it had become a habit. In one of these villages where this request was made, and in two other places large feasts were being conducted where immense quantities of bananas, taro, coconuts, chickens and pigs were being consumed. And yet government aid was asked for.

Following this same hurricane all District Governors and Pulenu'u were asked for a report of damage done in their respective districts and villages. One District Governor reporting for a village in his district reported

12. Keesing, Modern Samoa, 344.

100 percent damage of everything. A visit to this village three weeks later found everything blooming like a rose. The reports of the Pulenu'u were many and varied. Very little faith could be placed in these reports because they were guesses in most cases colored by a desire for government aid. The report of one pulenu'u to the Attorney General of damage done represented in the mind of the Attorney General the most concise report he could get and probably as clear a picture. It was as follows: Coconuts more up than down; Breadfruit more down than up; Bananas all down.

At the time this was written several officials of the government were preparing to extend aid to the people in the way of food. It is true that there will be a shortage of bananas and possibly some taro but this shortage has resulted from the fact that only sufficient food is produced for the present population if all weather factors are perfect. No allowance has been made for any calamity and yet in September of 1935 many Samoans said that there would be a hurricane in the early part of 1936. Advised to plant more food in preparedness if it should come, the shoulders were shrugged and nothing done. Before the American Government came into American Samoa there were hurricanes and no outside help was given or expected. In times of stress the wild yam was gathered, Elephant Ear or giant taro was gathered and eaten. Masi, the preserved breadfruit and bananas that had been buried underground

for months or years, was used. A little of this is being done now and the people could get along without aid. There would be a little hardship it is true, but it is felt that less generous extention of aid would do a great deal towards dispelling the feeling of dependency that has grown up.

Note: Up until May 31, 1936, no food was given to the Samoans by the Navy. They had purchased a great deal of flour, rice, and potatoes from the stores themselves because native food was short. The Station Ship U.S.S. Lark made one trip to Western Samoa for a load of taro, bananas, and breadfruit. This food was donated by the people of the island of Savai'i in Western Samoa. No charge was made by the Navy for going after this food.

Another place where the government has been too kind to the Samoan and also has contributed to the economic unbalance of the group is the Fita Fita Guard. These men, 80 in active service, and 43 on the reserve list receive the same pay rating as the American Sailor in a similar position but who has to live in an altogether different economic set-up. This act of Congress in creating the same pay rating was a serious mistake. As Keesing states¹³ this has made the Fita Fita the "aristocrats of American Samoa." It has built up a high standard of pay in a locality that does not demand it and has made it difficult for all other departments to match. In fact, the other departments cannot match it so it has become the ambition of all

13. Modern Samoa, 347.

Samoan young men to become Fita Fita, even if they are working in other worthwhile positions. It has also done much to cause the best individuals, who would ordinarily become the matai much earlier, to become members of this organization with a consequent loss of their intellect in family and village affairs. Going further, this large payroll attracted the members of the family of the Fita Fita and even his matai. He was called on and expected to turn over a great deal of his income to them upon request or to lose "face" in their eyes. What was his, was theirs. This opportunity to obtain money following the great drop in copra income was quickly made use of. This, plus the same call on all working individuals has taken up much of the slack of reduced income, and the matai has not been forced to create new methods. It should also be said that as in the regular Navy, members of the Fita Fita Guard retire either at the end of sixteen or twenty years service as they desire, with a very ample pension, exactly the same as the American sailor receives upon retirement.

As stated in Chapter I under past and present attempts to foster agriculture, very little has been done directly with the matai. Articles in the O Le Fa'atolu have reached them, but this is not as good as a personal talk or discussion. The Superintendent of Education spent some time the past two years during each visit to a village, while he was holding a conference with the matai, to talk about agriculture. Some response was obtained

here and there it is believed. If this same approach is continued it is felt that eventually benefits will accrue. The same subject must be mentioned several times in many different ways before it is understood or used.

Too often the attitude is taken by the white man that the Samoan is lazy and that the matai are nothing but a group of squatting chiefs. This attitude is sometimes apparent in the approach that is taken to encourage agriculture. The Samoan is very tempermental and he readily realizes this attitude and the reaction is a very conservative one. He knows that he and his race have managed to get along for thousands of years as they are and he is determined to be independent.

It is believed that the main reason for the failure of past and present attempts to aid agriculture are the facts that, (a) There has been too much talk and written material and not enough do or action and demonstration. (b) The matai who are the representatives of their people have not been appealed to directly. Also, insufficient explanation has been given to them regarding the why of agricultural expansion. This is an absolute necessity with such a group of conservative individuals. It is believed that the start of this expansion has to be made by some outside interest, or let it be said, the Government. This means the presence of a qualified agriculturist to demonstrate methods to them and then to point out sympathetically and help them to make the start themselves. The Department of Agriculture to

date has had no such individual, and the Samoan knows it.

Even when the above is done there will never be the wholehearted reaction that is desired. This will be due to the fact that so many of the matai are older men, very conservative, who cannot change. The change on the part of those who will make the change will be very slow and unless expected and looked forward to, the possibility is that the ones responsible for it will become discouraged and the whole plan abandoned, leaving conditions exactly as they were.

However, there is a way out of the dilemma and it is the only way that will carry on indefinitely and result in a changed agriculture in American Samoa. This way is through education. Children entering the schools should from the first be taught an appreciation of labor, leading on into nature study and culminating in agriculture itself. This should limit itself entirely to the crops and animals of American Samoa. Any institutions going beyond the level of the public schools should place much stress on agriculture, branching out into the economics of agriculture and the possible importation of foreign crops. This should hold true for a period of several years and then this advanced work carried down into the public school years when the pupils show an ability to be able to use it. Then the advanced institutions could go on further in agriculture. Under this plan, the matai of the future will have a thorough groundwork in agriculture for their needs and at that time, and that time only,

can present wishes or plans be fulfilled. The matai would again be the real leaders of their families because they would then be doing their duty as to the welfare of their family groups. It would again mean a happy and contented populace with the government and the matai working together for the welfare of American Samoa. However, there is much to be done in preparedness for this happy day.

CHAPTER VI

AGRICULTURAL EDUCATION

1. Adult Education.

Adult education is taken up first, not because it is the more important agriculturally, but it is the more important in creating an attitude of mind. Unless the adults feel that teaching agriculture to their children is the correct thing to do, and an agreement on their part to allow the children to grow up to practice what they have learned, education will be doomed to a prolonged series of failures. This will postpone the end desired for many years. Therefore, it becomes a necessity to educate the matal especially, to this point of view and in the educating, some at least will go further and practice along with the children the things learned.

As stated earlier there has been too little demonstration of correct methods in agriculture. The claim on the part of some Europeans is that much time and money has been spent on the Experimental Farm and that absolutely no changes have been made on the part of the Samoans in their methods. The reason for this is the fact that at the experimental farm crops such as sweet potatoes, radishes, beets, corn, egg plants, peppers, and papayas have taken up almost all of the area and time. Very little area has been in teak, avocados, macadamia nuts, pigeon peas, and oranges. No work has been done with taro, breadfruit and

coconuts and very little with bananas. The crops that have been produced have been what the white man wanted and uses, not the Samoan. He is not interested in vegetables. He is interested in his own foods primarily and these have been neglected. Therefore, as a demonstration to the Samoan the experimental farm has been a total failure.

If the experimental farm and Governor Landenberger farm school, which adjoins it, are to fulfill the purposes for which they were started an entirely different policy must be used. Working with a people like the Samoans, agriculture dealing with everyday needs must be the starting point. The preparation, planting, care, harvesting, and marketing, or use of coconuts, taro, breadfruit, and bananas must be emphasized first. Starting in a small way teak, limes, oranges, and macadamia nuts should be produced in the best ways for local conditions, but even these should wait a few years until improved methods have proven their worth with everyday crops. Still later should come importation of foreign crops that may prove their usefulness for Samoa.

In order that the above is done without loss of time and to forestall mistakes, an individual trained in tropical agriculture should be obtained in some manner to handle the farm and the school. This person could either be an agriculturist sent by the United States Department of Agriculture or a graduate student working

on a further degree who would remain at least for three years. It must be remembered however, that this will have to be a continuous policy and not simply for three years. Mistakes must be avoided because the Samoan would immediately feel that the agriculturist knew no more than he.

It is recommended that improvement in methods of production rather than the use of new varieties be the core. Suggested handling of coconuts is given in Chapter IV of this thesis. Somewhat similar changes with breadfruit and bananas should be taken up. Preparation of the soil, planting, care, and harvesting should be carefully done. This is also true of the taro. Probably the quickest results in stimulating interest in new methods can be obtained with this crop, as it is the staff of life in Samoa. The Samoan believes that he knows what should be done to get the most and best taro out of a piece of land. In most cases his preparation is inadequate, he does not select the best planting material, he does not cultivate his soil enough during growth, he does not spray for worms. Working only with things at hand much improvement could be demonstrated in a short period of time.

Inasmuch as pork and fowl play such a large part in the diet of the Samoan, especially the matai, the experimental farm and farm school should raise these animals and birds. It is recommended that the start not be made with purebred stock. Local stock should be obtained and improvement effected through better housing, feeding, and

general care. Later, after improvement has resulted further improvement could be made by bringing in more prolific males that have proven their worth in the tropics.

As the above plans are started and carried out, every opportunity should be taken to call to the attention of the matai primarily what is being done, how it is being done, and what the results will be. These matai should be encouraged to visit the farm to see the work itself and the benefits being obtained. At first, they may even have to be taken to the farm, that is, transportation provided, but after a time this can be stopped as interest is aroused. The agriculturist could arrange these visits from time to time and he should not miss the opportunity to point out to these matai that when the children now attending schools are graduated they will be able to do the same things that are being done at the farm.

Somewhat similar plans for Feleti School should be made. Feleti School is a boarding institution where the Samoan food is raised on the school property. That is, taro, breadfruit, bananas and coconuts. These should be planted and cared for in the best ways even if foreign to the present ideas of the boys. Being adjacent to the experimental farm the same methods as used there would be best. This will demonstrate to the parents and matai of the boys at Feleti the better methods also being used at the experimental farm. This will demonstrate to the matai that these boys, who are expected to be the matai

of the future, are keeping abreast of the pupils in the public schools and even going further as Feleti can have more equipment and area. This should enhance not only agriculture but the value of Feleti as well.

Each public school in American Samoa has a plantation or garden area where agriculture is carried on. To date these areas have been planted and cared for much the same as all other areas. Some vegetables and other foreign crops have been raised, but this has stopped and only local crops are being produced at present. As mentioned earlier work has been given to the teachers in the yearly institutes by Mr. R. M. Faulkner and the Superintendent of Education in agriculture, but so far it has resulted in the development of a background rather than actual active results. The plantations in some cases are cleaner than other areas but no attempts to improve have been made. With the aid of the agriculturist at the experimental farm the teachers could be shown the work going on and be taught how to do the same thing. This could be a very valuable part of the institute, spending as much time there as deemed necessary by the Superintendent of Education. In fact, a whole institute might well be spent there. Then upon going to their respective villages to teach they could put into practice what they learned at the farm. Each plantation then would become a demonstration area for adults in that vicinity as well as a place for the children to learn practical agriculture.

Along with the experimental farm, Feleti school, and the public schools as demonstration areas, the agriculturist should hold County meetings from time to time. These meetings could take the form of talks and picture slides to the assembled group as well as answering questions put to him. If the meeting were held in some out of the way place, which would often be the case, the public school plantation could be used to point out practical benefits resulting from different methods. At times, these County meetings should be convened at the experimental farm where more is being done than on the public school plantations and where livestock is present.

Under no circumstances should an opportunity be overlooked to call to the attention of the matai the changed methods and the results being obtained. Equally important is the explanation of these results. It should be pointed out continually that what is being worked for is something that will benefit the matai by giving him something that will definitely make it possible for him to handle the welfare of his family group. Some of the new methods would require more work but it should be pointed out that a great deal more production would be obtained, so that for the results he would not be working as hard. This is very important at first. Later, after a few years, further light could be thrown on the results by pointing out that less area is necessary for food, leaving more area for the production of cash crops. However, this part should not be stressed too early.

Adult education by example goes along more or less with demonstration except that by doing the correct things at all times, an example will be set for the people in that locality. This is an active everyday affair rather than a pointing out on the part of someone, as is the case when demonstration is being spoken of.

The public schools on their plantations or garden areas should be carrying on agriculture in the best manner possible. Overzealousness and extreme care should be practiced so that the example set might carry over at least in part to the people observing.

The same holds true for the experimental farm. However, in this case it would probably be better not to spend too much time in being careful because it might result in the opposite reaction to what is wanted. The farm should be well handled, with no mistakes, and cared for practically. This would naturally be the result if an agriculturist were in charge.

The agriculturist would develop, or find in his travels, certain farmers who do certain things better than others. These men he would encourage to continue their work and to improve further. This would take time, but it would be well worth the effort as their example to others in the community would be very valuable. Seeing one of themselves doing things differently and also seeing the benefits derived they would be more inclined to adopt some of the methods than if some white man did them or talked about them.

From what has been stated earlier the opinion may have been formed that writing about agriculture in the O Le Fa'atonu does no good. This is not the impression that was intended at all. These articles have done some good in that at least they have made the Samoan think a little about agriculture. These articles dealing with new subjects from time to time should be written to assure continued thought. After the start in new methods at the experimental farm has been made, and the agriculturist has had time to look around a bit, he could very profitably call attention to the farm and explain in writing why certain things are being done. He could even pick out certain sections of the islands and write articles dealing with the agriculture of that section alone and then shift to another section in the next issue, and so on. This would tend toward competition between the sections, and the Samoan thrives on competition.

The articles in the O Le Fa'atonu should not be too long, should be interesting, and based on an average mentality of twelve or thirteen years of age under American standards. As a rule, these articles should be a little ahead of the work in progress or leading up to some later plan that is still in the formative stage. This would lend an air of mystery to the articles and help a great deal in stimulating interest. These articles have a place in the program surely, but they must be carefully prepared for consumption in Samoa by the Samoans and not the white people.

Each quarter, the Governor of American Samoa visits the home village of the respective County Chiefs. On these

visits the important matai of the county are gathered together to hear what the Governor and his Department Officers have to say to them as well as providing an opportunity to state any suggestions or ask any questions. These visits are very helpful in building up friendliness on both sides and a better understanding of what is being done by the Government. These visits also give the matai an opportunity to speak and they feel that they have a part in the government itself.

It has been the policy of all Governors in these meetings to discuss agriculture to some extent. This has often been very cursory it is true, but it brings to the attention of the matai the fact that the Governor personally is interested in the agriculture in which they are engaged. This is an excellent plan and should be continued. A suggested improvement might be that the Aide for Agriculture or the Agriculturist be taken along on these visits in order to discuss agriculture more fully. Every opportunity should be taken by the Governor to discuss agriculture with the matai. The results, as stated earlier, will be slow, very slow probably but in order to obtain them much patience and time will be required.

When an agriculturist is obtained for American Samoa there will be no need for the Aide for Agriculture except possibly as a financier attached to the Governors staff. At present the Aide for Agriculture is the Radio Officer whose training and interests are toward that end and rather

than agriculture. This is only natural and is probably the case with 99 percent of Radio Officers who will be ordered to Samoa for duty. Therefore, it is imperative that an agriculturist be obtained.

This agriculturist in addition to handling the experimental farm and possibly the farm school later, would travel around the islands to encourage agriculture, and to hold county meetings. He would also hold meetings with the matai in the different villages and discuss all types of agriculture with them in order to obtain their interest and active cooperation in agricultural plans. This man could do much more to further adult agricultural education throughout the group than any other individual.

The Superintendent of Education is mentioned in this thesis at this time because the last man holding that position was an agriculturist and the newly appointed one is as well. The Superintendent of Education makes many trips to the various villages and could discuss agriculture with the matai. The past Superintendent spent many hours in this way. It is felt that at least a better feeling toward it has resulted, paving the way for further work on the part of the new Superintendent. Much can be done to obtain the cooperation of the matai in the agricultural work being given in the schools. This cooperation is necessary before the children being trained in agriculture can be given a free hand to put into effect newly learned ideas.

In the yearly Institutes for teachers the Superintendent of Education can do much. During the past three institutes agriculture has been taught to the teachers and some results have followed. This should be continued in order to prepare the teachers for the teaching of this subject to their children. They should also spend quite a little time at the farm. In fact, this should become a very vital part of the yearly institutes. These teachers who are adults are learning new methods and plans, and when they drop out of the teaching force to return to their villages they will influence greatly the attitude of the adults there toward agriculture.

The Faifeau, or Pastor in American Samoa holds a position in the esteem of the people which no other person holds, not even the highest chief. He has chosen for his life's work the teaching of Christianity to his people and religion plays such a great part in the lives of the people that he is in fact the hub of their universe. The Faifeau is the strongest power in the village life, barring none. His advice and friendship is sought after at all times.

As stated earlier, the London Missionary Society (L.M.S.) organization found it necessary in past years to make it obligatory that their pastors do not have a matai title. However, this is not necessary in their case because they are accorded as much say in the fono affairs as the chiefs and even more respect than the chiefs themselves.

Each district of American Samoa, of which there are three, has a head Faifeau which means when translated into English, Supervising Pastor. In other words the title corresponds somewhat to a bishop. These Supervising Pastors have quarterly meetings with the other faifeau of their districts on church and other matters dealing with the religious affairs of their villages. The last Superintendent of Education met with all faifeau on the island of Tutuila once and took up agriculture dealing with coconut production with the request that this information be passed on to their congregations and especially the matai. It is felt that this approach to the people should be continued as it has great possibilities for betterment of agriculture. This approach should consistently be made by the Aide for Agriculture or the Agriculturist and the Superintendent of Education. In the end the problem of increased agricultural production must be solved by the Samoan himself and he will be more willing to listen to the faifeau about the matter than any other person. Therefore, it is essential that this approach be utilized to its fullest extent. In the one meeting held, keen interest and approval was manifested in the material presented.

2. Education of Children.

The education of children is dependent upon the teachers and conditions themselves. The economic condition of the area vastly influences education, as that is what causes

adequate or insufficient equipment. It also has a decided bearing on the ability of the children to learn as malnutrition, due to an improper diet or a lack of food, makes for success or failure. However, it has been pointed out in the foregoing pages that the diet of the Samoan is complete and malnutrition is almost an unknown trouble. This leaves then the teachers and equipment available.

Until Mr. R. M. Faulkner gave the teachers of American Samoa work in agriculture at the Teachers Institute of 1932-1933, no work of this nature had ever been known to them. As mentioned earlier the Superintendent of Education carried on this work started by Mr. Faulkner in the Institutes of 1934 and 1935. All of the Teachers at the present time have an elementary knowledge of agriculture and how it should be taught. The efficiency with which they use it however, varies with the individual. A few of the teachers have made quite a success of the agricultural work that they are teaching their children while others have failed. This same picture holds true in other places, and even getting a small percentage to make a success of it in a period of three years is quite an accomplishment. Further institute work will probably bring greater success.

At the present time each school has a plantation area that is planted and cared for by the pupils of the school. As explained earlier, until this present school year (1935-1936) many vegetables used by Caucasians have been produced in the school plantations. This year, however, this has

been changed and local crops produced. Very few changes in methods practiced have been made but larger areas are under cultivation and a much better attitude toward agricultural work on the part of the pupils attained. The younger children in the primary grades (1, 2 and 3) are not expected to carry on plantation work but keep the school grounds clean, flowers and hedges planted in the school grounds with a development of cleanly habits as well as a love of beauty. The intermediate grades (4, 5 and 6) as well as the upper (7, 8 and 9) do the plantation agriculture. At least three hours per week is spent in this work while the same time is used by the primary pupils. This is in the nature of both class work and outside work. Picks, shovels, hoes, and rakes as well as spading forks are in the schools for use in the agricultural work. Not all schools have all of these but a representative set of tools is in each school. The pupils themselves furnish the ever useful bush knives as needed.

The actual later practice of agriculture as taught in the school is a very slow process. Education anywhere is a slow process and it must be clearly understood that this is very true in Samoa. However, even if agricultural education in the schools has not progressed to the point that is wished for it, a plan for future growth must be made. The groundwork has been laid in previous institutes for a continuous growth on the part of the teachers in agricultural information as well as the teaching of it. This should be

continued in order to assure the best preparation for this necessary part of the child's development. This will have to be done with all teachers until such time as it will be possible to have special agricultural teachers. Other suggested teacher training methods have been given under adult education.

A handicap that must be overcome shortly is the fact that in all cases except three or four, the land that is set aside by the village as a school plantation changes yearly. The area is usually under a certain matai and he loans it for school purposes for a year as a school plantation and the following year another chief does the same. In this way no long time program has been or is possible, especially so when breadfruit, bananas, and coconuts are long time crops, which take a good deal over a year to show results of any consequence. The Department of Education through the aid of the Governor of American Samoa should arrange with each village to have a certain piece of land, about two or three acres and up in area depending upon the size of the school, set aside for use over a period of years. This period should preferably be stated as at least twenty so that benefits of new methods with coconuts can be apparent. Then, and then only, will the school plantation be a place different from the areas surrounding it. At the present time a change can be shown in taro production only in a period of a year. The benefits of new methods on a piece of land used for several years by the school are especially apparent at the present

time at Iiiiii. This could be duplicated in many places if the above plan can be put into practice.

In earlier pages much has been said regarding different methods of handling the crops of Samoa. Better preparation of soil, seed selection, better ways of planting, better care during life, insect and fungous control have been given for taro, breadfruit, bananas and coconuts. This is what is meant in the following outline of agriculture in the schools and is mentioned here so that the same material will not have to be repeated.

The public schools of American Samoa are divided up into grades from one to nine inclusive. There are twenty schools in the system, eleven of which run as far as the sixth grade, two of which run up to the eighth grade, and two which run to the ninth grade. The others are primary schools in isolated areas running to the third grade, and in two instances including a fourth grade. Primary grades are one, two, and three; intermediate grades are four, five, and six; upper grades are seven eight, and nine. Insofar as possible, and in practically every case, the primary grades are taught as a group by a teacher; the intermediate grades are taught as a group by a teacher; and the upper grades are handled the same way. The only exceptions are in the cases of the two largest schools where there are enough pupils to have individual grades. Each year there is a theme for the years work through which every subject is integrated. They are as follows:

- Year One -- Homes and Home Life.
- Year Two -- The Child's Community Life.
- Year Three - Foods and How They are Secured.
- Year Four - Shelter and Clothing.
- Year Five - Transportation.
- Year Six - Communication.
- Year Seven - The Poynesian Environment.
- Year Eight - Government.
- Year Nine - Nations as Neighbors. (1)

If a child enters school when the primary theme for the year is "Foods and How They are Secured" then this child's second year theme will be "Homes and Home Life" and so on. Each child will receive all themes whether they are in the order of the schedule or not. It might be said that the plan is functioning smoothly and efficiently.

The foregoing has been given because the following outline of agriculture for the schools of American Samoa has been drawn up with the group idea in mind. It would be a mistake, and impossible of fulfillment to list the work by individual years while the other school work is based on group series of three years.

Primary Years.

In the Primary Years the idea back of the agricultural program is that it is an active observation time rather than concentrated class study. The aims of these years should be: (1) Development of good work habits, (2) Development of a sound attitude toward work, and (3) An appreciation of and for nature. No less than three hours per week should be devoted to this part of the child's program.

Inasmuch as practical agriculture or nature study is much more important for children of this group than class-work, the outdoor or field work will be given first, the items being listed numerically for conciseness and clarity. The work then should consist of:

1. Keeping the school grounds neat and clean of rubbish and weeds.
2. Planting flowers, ornamental bushes, and hedges in the school grounds.
3. Planting flowers, ornamental bushes, and hedges around the child's home.
4. Care of pets such as cats, ducks, dogs and chickens.
5. Making excursion trips to see the plantations of their brothers and sisters in school, the plantations of their fathers, to see animals, to see beautiful flowers growing and to visit the homes of different members of the class to see the flowers that have been planted. Excursions to places where nature can be seen and observed should be made. Note: These excursions must be planned by the teachers and children beforehand and the teacher well versed in what is to be seen. The teacher should make use of every opportunity on these excursions to point out the different plants, why they are growing there, and how they came to be there. Not more than one excursion should be made each week.
6. Making pens for their pets at school.
7. Telling stories about their pets either as they are grouped around them or in the class. These could deal

with the size, color, and shape of their pets as well as food eaten, amount of food, and time of eating.

In the classroom, the work should consist of:

1. Telling of stories of excursions and beautification work.
2. Writing little stories of these same things and reading them to the class.
3. Drawing pictures of the different trees, plants, and animals.
4. Having the teacher bring in complete small plants and flowers and telling the children about them. These plants should have the roots and root hairs attached.
5. Having the teacher perform such simple experiments as placing an avocado seed in water by using toothpicks and setting them down on the top of a glass full of water. The children can watch growth start and the development of roots and root hairs. This should be talked about in detail. Later the teacher could cut off only the root hairs to show that the plant will die.
6. Having the teacher take the children outside to two small plants or bushes and then pulling half the leaves off of one of them while the other is left alone. When the results show up the teacher should point out the reasons and also call attention to the coconut trees around them where half the leaves are cut off. The same thing could be done in cutting notches in small plants to point out the effect on the coconut trees.

7. The teacher of the primary group should keep a complete record of all activities done, dates, time used, and work accomplished. Possibly after a time some of the brighter pupils in the third grade could help in keeping these records. These records should be shown to the children and discussed with them.

Intermediate Years.

In the Intermediate Years the idea back of the agricultural program is that it is an active doing time on the plantation and doing in the best way. This will have to be shown them by the teacher. Only Samoan crops should be produced. The aims of these years should be: (1) Development of correct work habits, (2) Development of a pride in work accomplished, and (3) Development of an appreciation of and for agriculture. No less than six hours per week should be devoted to this part of the pupils program.

In this group it must be clearly understood that the teacher still points the way. Pupils in Samoa for the next few years at this age will be unable to study agriculture of the future alone, so therefore, the teacher must demonstrate himself and get the pupils to carry on as he shows them. Only new methods must be used. The teacher must insist on this because present practice will be the hardest thing in Samoa to break down. It will require constant attention on the part of the teacher. With this in mind the work should consist of:

1. Experiencing a need to produce food--taro, bananas, bread-fruit, coconuts.
2. Discussing and deciding on the best location for the plantation--if they were choosing. Note: A person in Samoa does not choose a location for his plantation--he is given land by the matai.
3. Preparing the ground correctly.
4. Securing the best seed and planting correctly.
5. Cultivating the soil correctly.
6. Caring for the crops during growth, such as:
 - a. Watching for pests and diseases and treating them.
 - b. Irrigating if necessary.
 - c. Keeping out livestock and marauders.
7. Harvesting the crops at the right time--not too early.
8. Using the product correctly.
9. Introduction of picks, hoes, and spading forks where possible.
10. Excursions possibly once a month to other plantations where old methods are used. These should be discussed and compared with what they are doing.
11. Building and using rat traps on the plantation.

In the classroom the work could very well consist of:

1. Keeping of individual notebooks containing a record of events, time spent in each operation on each crop, jobs done, excursions made, and things seen. These should also contain written compositions on excursions, the new methods being used that are different from the old. Also simple maps of the plantation should be made.

2. Discussing and planning with the teacher very thoroughly each operation before it is done on the plantation.
3. Doing simple experiments showing osmosis, necessity of sunlight, transpiration, seed germination. These should then be written up in the notebooks.
4. As much of the material in school as possible should be pointed towards agriculture. This works in very nicely with the theme subjects "Shelter and Clothing," "Transportation," and "Communication."

Upper Years.

In the upper years the idea back of the agricultural program is that it is an active thinking and doing time both in the classroom and on the plantation. The aims of these years should be; (1) Development of an intelligent, thinking individual, (2) Development of a scientific attitude toward agriculture, and (3) Development of a pupil desiring actively to participate in improving food crops both as to quality and quantity. No less than nine hours per week should be devoted to agricultural education in the upper years.

When a pupil reaches this stage of his development he should be old enough and developed enough to work more on his own. The teacher, especially in Samoa, will have to more or less point the way, but he should advise more than direct. He should be consulted rather than questioned. The teacher in this group must be full of his subject. He should be able to suggest things for the pupils to do, the

suggestions being based on previous study and experience. Only the best prepared teachers in agriculture in American Samoa should handle this work. In this group both the classwork and the plantation work are of great importance. In many cases material is best taken up both in the classroom and the plantation as well. Therefore, no differentiation will be made in this group between the two but rather the points will be listed in the order of their importance.

The work then in the Upper Year Group should consist of:

1. The requirement and use of a textbook such as "Nature Study Agriculture" or "Tropical Agriculture". No textbook has been used earlier because for the next few years at least the pupil will be unable to use one earlier. Here it is felt to be a necessity.
2. The presence and use in each school having these grades of bulletins published in Hawaii and elsewhere on coconuts, taro, bananas, breadfruit, yams, poultry, and hogs as well as various books on these same crops and animals.
3. A school plantation worked on as in the case of the intermediate group but on a more intensive scale. Changes in practice should be made as class study of textbooks, bulletins and other books develop new ideas.
4. Equal plots on the plantation, one plot maintained under old methods similar to the regular village plantations, and the other plot to be maintained under the newest and

most modern methods. The same number of plants and trees should be present on each plot. Accurate records should be kept on these plots, especially the harvest and labor. The figures obtained, and the results, should be carefully studied and analyzed.

5. A thinking through by the pupils in conjunction with the teacher of the reasons for the new methods being followed on the plantation. Going further, there should be a critical study of the value of the new methods over the old.
6. A study and understanding of land areas.
7. The keeping of an individual notebook containing areas of different crops on the plantation, numbers of each, time of planting, time of harvesting, production figures, operations performed, time of labor on each crop, tools used, uses of product, value of product, value of labor expended, profits derived, and maps of the plantation. This must be checked by the teacher for accuracy, neatness, and English.
8. The making of compost beds which are used in conjunction with the plantation.
9. Experimenting in methods of planting, and care should be continually practiced. Suggestions for these could best come from the agriculturist and the Superintendent of Education.
10. Developing in the pupil an understanding of the value of time in agriculture.
11. A study, simple of course, of insects and insecticides and then using them, and also fungous and fungicides

and then using them.

12. A study of foreign agricultural implements found in the textbook, bulletins, and books. Discussion of their possible use in Samoa. A few might be imported to be tried out. This might be done at the experimental farm and results reported to the schools by the agriculturist.
13. Planting out, either on the school plantation or adjacent to it, new plants suitable to Samoa. Suitability should be determined at the experimental farm and then sent out to the school plantations for further work. These plants might be Pigeon Peas, Teak, Macadamia Nuts, and possibly Rice. This will give the pupils an opportunity to study these crops at first hand.
14. Possession by these schools of poultry and hogs. Correct methods of feeding, care and breeding should be carried on at all times. Here again accurate figures of all operations must be kept.
15. A study of copra production, its transportation, and uses made of it. The same could be done for possible future production of teak wood and macadamia nuts.
16. Developing in the pupil an understanding of and appreciation for the necessity of greater production per unit of area in American Samoa.
17. Developing in the pupil an understanding of the necessity for more cash income in American Samoa. Going further, the pupil should be developed to the point of understanding that the only way to obtain this income is by agriculture.

Landenberger Farm School and Feleti School are classed together agriculturally. They are almost adjacent to each other geographically. To walk from Feleti to the Farm School location takes a matter of possibly four or five minutes. It would be a mistake to have both schools teaching similar work in agriculture when they are contiguous. Also, there probably will be no need for several years to come of both schools because the number of students will not warrant it. It would mean a duplication of effort that would be harmful to agricultural education.

If an agriculturist is obtained, the Landenberger Farm School should be the agricultural school to which the Feleti pupils should come for certain hours during the week for instruction. The experimental farm lies between Feleti School and Landenberger Farm School and it is there that the pupils could do plantation work. The Feleti pupils would also have their own plantation to work on. If no agriculturist is obtained Feleti School should be the agricultural school for work beyond the public school level. If this becomes the case only the regular pupils at Feleti would receive the work unless an added instructor was obtained to devote his efforts solely to this vital subject. If this is done the instructor should be a Caucasian because at the present time no Samoan is qualified to do it.

The most urgent need at the present time is not a farm school as such for pupils beyond the public school level but for the training of the teachers of American Samoa so that they will be able to handle the agriculture in the schools as

outlined in this chapter. If this is done and the pupils passing through the public schools trained as suggested, there then will be a necessity for further training of a few. That, however, is at least nine years in the future. At that time the feasibility of an agricultural school could be definitely determined and either made a part of the Feleti program or given at the Farm School. This is a matter for future consideration.

When the students entering Feleti have had the benefits of the nine years agricultural work in the public schools they should be given more advanced work to prepare them further for their life work as the matai of their villages or counties, or as teachers until they become a matai. Looking ahead to that time the following agricultural curriculum is given. This is not given solely for Feleti but for any similar school that might be started in American Samoa.

This curriculum then should consist of:

1. More advanced textbooks on Tropical Agriculture.
2. The presence of many bulletins, pamphlets, and books on Tropical Agriculture.
3. A school plantation where fertilization can be and is practiced as well as insecticides and fungicides.
4. The carrying on of much experimental work. This should be more advanced than the experimental farm and suggestions made by the agriculturist.

5. A study of foreign crops and their possible use.
6. A study of agricultural labor in foreign places as well as in Samoa.
7. A study of the area necessary for the maintenance of one individual.
8. The making and operation of a weather station.
9. A scientific study of seed selection.
10. Budding, grafting, and pruning.
11. The scientific breeding and care of poultry, hogs, and dairy cattle.
12. A scientific study of copra production and its marketing.
13. Preparing the teachers of American Samoa so they can handle the public school agricultural program.

When the pupils have completed the nine years of agricultural work given by the public schools of American Samoa they will be able to read English well and to understand it. They will have an understanding of agriculture so that further printed information given them can be understood. Some of them will be able to carry this over into use after understanding comes.

Nothing in this world is static and this is especially true of agriculture. Pupils upon graduation will not know it all by any means and as new crops or methods are found either at the experimental farm or elsewhere this information should be given them. This is adult education, yes, and it is also follow up work that should be done. The aide for agriculture, the agriculturist, if there are both, and the

Department of Education should cooperate in this matter. The Department of Education through the teachers might make this information available to previous students, or it might be mimeographed and sent out. Still another method would be to publish it in the O Le Fa'atonu. At any rate, this will be a valuable aid to the people and should be planned for when the need arises.

In conclusion it can be said that only through agriculture can economic balance be restored to American Samoa. This will have to be accomplished by an enlightened matai and government group working together through education. Education holds the key to the whole problem and it therefore becomes the duty of the schools of American Samoa to prepare a future populace able to fulfill the destiny for which Samoa was intended. Much time must be allowed and endless patience displayed on the part of those concerned.

APPENDIX A.

COPRA IN AMERICAN SAMOA

Articles Published in the O Le Fa'atonu.

These articles were published in the monthly newspaper O Le Fa'atonu in both English and Samoan. This newspaper is published by the Government and one copy is sent to each matai in American Samoa without charge.

Article 1. O Le Fa'atonu, November, 1935.

Coconuts.

In all countries and lands people must eat. Also, they must wear some clothes and have some type of shelter. Food can be grown but oftentimes, clothes, shelter, and taxes must be provided by cash or money.

In American Samoa, the people can live on food that is produced here. However, as time goes on more and more food is purchased to supply new tastes. These foods are corned beef, salmon, sardines, flour, sugar, etc. This means money is needed with which to buy these things.

Money is also needed in American Samoa with which to buy lavalavas, shirts, dresses, and to pay church dues and taxes. Therefore, the people of American Samoa must have some money. At the present time, this money is obtained from the production of copra only.

The writer knows that the people of Samoa depend greatly upon the coconuts, the leaves, etc., of the coconut tree in addition to the production of copra. The leaves are used for baskets, fish traps, polas, etc. The nuts are

used for drinking nuts, for the meat in the nut, for kava cups and charcoal. The husks are used for making sennit which is used in building houses.

Because of the above facts, it would be very foolish to say that things to replace them should be imported. It is true that they could but why disrupt the whole life here in order to produce more copra in order to get more money to buy these things? It becomes a cycle getting nowhere. Therefore, we will start on the premise that the people can use best the things that they have.

The population of American Samoa is increasing at about 2 percent per year. This will mean that more land will have to be used in the future in order to produce the food needed. Most of the arable land here is now used for food and copra. Therefore, in the future more food and copra will have to be produced on the same amount of land. In order to make a start, the first articles will deal with copra.

The production of copra can be increased here tremendously on the same number of trees as are growing now if the following things are done:

1. Selection of Nuts to Plant

Any coconut almost will grow. However, every coconut will not produce the same kind of tree. It is the same as with people where the strongest children are born to the strongest parents. The best coconut trees grow from the best nuts that are planted. This brings us to the point of

what is the best coconut tree? The best coconut tree is one that is not too tall to make them easy to climb to get the nuts; one that has large nuts containing much meat; one that has many nuts on it; and one that produces well for several years. In choosing nuts for planting they must be selected while they are still on the tree. Nuts cannot be selected from a pile because it is not known what kind of a tree they came from. Therefore one who wishes to plant nuts in order to get the best trees must look around and find a short or dwarf tree, that is, one that does not grow over twenty-five or thirty feet high no matter how old it is. There are a few trees of this type in American Samoa. The tree must also have large nuts, that is, about once and a half as large as a man's head. The tree must also have many nuts on it, that is, anything above fifty nuts. The nuts must also have thick meat in them and a great deal of it. When all of these things are found on a tree, that tree should be marked with a Tapu and absolutely no nuts removed except for planting purposes. The nuts should be left on the tree to ripen and allowed to drop off instead of being picked off too soon. (Next month the writer will tell how best to plant the nuts to get them started in the right way.)

Article 2. O Le Faatonu, December, 1935.

Planting the nuts.

After being gathered, the seed nuts must be stacked in a dry, airy place to "cure" for about a month before they

are planted. The nuts are ready to plant when most of the milk has dried up and the meat is hard.

The nuts should be planted in a special place or bed which has been cleaned of weeds and softened or loosened to a depth of about 12 to 18 inches. It is best to have this seed bed near the owners fale if possible, so it can be closely watched, and also some place where pigs and chickens cannot harm the seed. This point is very important.

The nuts should be laid on their sides and about one-half of the nut buried in the ground. The nuts should be placed about 6 inches apart in the bed. Here in American Samoa there is no special season to do the planting except that if the planting is done in May, June, July, or August care must be taken to see that there is sufficient rainfall to cause sprouting.

When the new shoots are about 12 to 18 inches in height and the young roots about 6 to 8 inches in length the nut should be removed from the seed bed and taken and planted in the plantation where it is wanted. In doing this a person must be careful to dig deep enough so as not to injure the young roots. Also it would be well to take soil along around the roots in a basket or bag so that the roots will not dry out before the nut is planted in the plantation. If they do dry out, the nut will die as it is the roots that feed the new plant. If our mouths were sewed up we could not eat and would die. This is the same as the roots of the coconut or any plant.

Why should the nuts be planted in a seed bed rather than in the plantation where the new tree is wanted? By having a soft seed bed, the nut will sprout faster than in the plantation. The owner can watch his seed better and therefore will not neglect them or forget them as he might if it were in the plantation. Also, all nuts will not sprout so only live ones will be planted out in the plantation from the seed bed. Also, some nuts are rather weak and only grow slowly and in a very weak manner. If allowed to grow in the plantation, they will never produce a tree with many nuts or good nuts. Therefore, only strong vigorous plants from the seed bed should be set out in the plantation. Weak and puny plants should be rejected because the coconut tree does not bear nuts until about 8 years of age and if one has to wait that long one should only plant the best seed obtainable.

In planting out the plants in the plantation they should never be planted closer than 30 feet in every direction. In most places, the trees are planted in straight rows as can be seen at the Mapusaga Plantation but in most places in America Samoa this cannot be done because of steep and rocky land. However, the plants can be planted no closer than 30 feet even if they are not in straight lines. The reason why this is done is because the roots of the tree must take food out of the soil and if planted any closer than this two trees will be trying to feed in the same place which will mean that neither of them get enough food and therefore produce less nuts and are weaker trees.

Also, the leaves of the trees must spread out a distance of from 10 to 15 feet in order to collect sunlight and air. If closer than 30 feet the leaves will interfere with each other. Without sunlight and air a coconut tree will die just as a person would. Therefore, it is essential for the best results to never plant coconut trees closer than 30 feet apart.

The hole in the plantation where the new plant is to go should be dug at least a week before planting. This hole should never be less than 18 inches deep in order to give the new tree a good start.

Article 3. O Le Fa'atonu, January, 1936.

Coconut trees do not bear coconuts ordinarily before the 7th or 8th year. After the 8th year the production improves for a period of about four or five years. That is, when the tree is about twelve years of age it is producing as much as it ever will. If it is well cared for this tree should produce about the same every year until it is about 30 years of age. This means that for 18 years the tree will ordinarily be producing at the rate of 100 percent. After this time, the ordinary tree produces less and less as it gets older. Eventually, the tree produces very few nuts, if any. This means that the tree is only taking up room in the plantation and not producing any profit.

A few trees, however, continue to be very good producers until they are about fifty years of age. The nuts from these trees should be saved for planting for new trees, as usually nuts from long bearing trees will produce new

trees that are the same as the tree from which the nut came. However, do not expect every tree to be a long time producer. At the present time very few trees in American Samoa are this kind.

Most of the coconut trees in American Samoa are too old. They are not producing as many nuts as a younger tree would. New trees should be planted to take their places. This should be done at once to assure future crops. In 8 years they will start to produce and the old trees should then be cut down and destroyed. The new trees should be planted between the old trees now growing but so that when the old trees are cut down the new ones will be no closer than 30 feet apart. Do not cut down the old trees before the new ones begin to bear.

It is best to figure that a tree will be a good producer until it is 30 years of age. This means then, that when a tree is 22 years of age a new tree should be planted between it and its neighbor so that it will begin to produce nuts when the old tree is 30 years of age and it can then be cut down. This will mean that you will have nuts all the time and from trees producing at their best.

The author realizes that in Samoa the age of any thing is not known. People do not know how old they are, time is measured solely by about. However, now that taxes are paid when a boy reaches 18 years of age it is very important to know the correct age. This has to come whether it is wanted or not. Therefore, it will be possible to know the age of a coconut tree and it will be known when a

new tree must be started between the old trees. In order to get best results, the age has to be known. There is absolutely no reason why it cannot be done.

Therefore, plant new trees when the bearing trees are 22 years of age in order to assure a future copra crop for yourselves and children.

Article 4. O Le Fa'atonu, February-March, 1936.

Many things are done in American Samoa regarding coconuts that for best results are wrong. The writer will take these up and explain better ways of doing things which require little effort on the part of the people.

1. Rats. There are millions of rats throughout the islands which do much damage to all crops, including coconuts. They should be killed by traps, dogs, and poison. However, as this stage has not arrived yet, the next best thing is to prevent injury by them. We are considering now the coconut. You all know the rat damage done to the half or three quarter formed coconut. He gnaws his way into the young nut to get the water and the young meat in the nut. The bat comes along and eats after the rat as well. About a week after the nut is gnawed into in this way it drops off the tree. A rat does not gnaw into one nut and use it all before gnawing into another one. In this way one rat may destroy 10 nuts a week. A very fair estimate of damage by rats has been made by Mr. Gotz who was manager of the Reparations Estates in Western Samoa who claimed a loss of 40 percent. This means that 40 out of every 100 nuts that you might are lost because of rats. Why let a dirty, fil-

thy animal like a rat rob you of food, clothing, soap, tax money, etc., because that is what is happening?

When a coconut tree is seven years old, it should have a tin strip put around it. Cut up a 5-gallon kerosene tin so as to lie out flat. Then cut it so as to make strips of tin about 12 inches wide and long enough to go around the tree. One kerosene oil can will make enough for two trees. Wrap the tin around the tree about five feet off the ground and nail the ends flat against the tree. This will then stop the rat from going up the tree as he cannot cross tin. If he cannot get up the tree he can do no damage there. Be sure that the tin is completely around the tree and also at least 12 inches wide. If any narrower than that the rat may be able to get over it.

Rats must come down from the trees at some time. By putting these tin guards on old trees you will also stop all damage there. In the Marquesas Islands which are north of Tahiti, all coconut trees have these strips of tin on them. If they can do it with copra at about 50 cents per 100 pounds why can't Samoa at \$1.40 per 100 pounds? In fact, it is criminal if it is not done.

Article 5. O Le Fa'atonu, February-March, 1936.

2. Notches in the Trees. Almost every coconut tree in American Samoa has notches cut in the sides for a person to use to climb up the tree to remove the nuts and leaves. This certainly helps in climbing the tree but have you ever stopped to consider the effect on the tree? Why is it that in the

large plantations in Western Samoa you cannot find a notch cut in a single tree? To do so means cause for discharge. This would not be done unless it was harmful to the trees. Samoans used to climb the trees with the aid of a thong tied between the feet. It could and should be done at the present time.

The tree is a living thing, just as you are. Take a sharp knife and cut a few slices of skin off your legs and arms. It will hurt you considerably. That is exactly what happens to a coconut tree. Cutting yourself will not kill you, but you feel bad and you are also liable to yaws and other skin diseases. Cutting notches in the coconut tree does not kill it but it allows the coconut beetle to work there, also for water to collect there where mosquitoes can breed, and allows rot to start which eventually causes death. Usually a strong wind snaps it off at this place, which makes the people blame the wind rather than the notches.

This is a serious matter and should be stopped at once. Stopping it can only be done by the matai. They should issue strict orders to stop this notching immediately and then see that it is carried out.

Only God can make a tree but people certainly can ruin them. Don't let it be said that the Samoans depend almost entirely upon the coconut tree for their very life and yet do more than any other people in the world to keep it from doing as well as God intended. By continuing this notching of trees, you are hurting God, the coconut tree, yourselves, and your children.

Article 6. O Le Fa'atonu, April, 1936

3. Leaf Usage. In Samoa, baskets for carrying food, clothes, etc., are made of the woven leaves of the coconut tree. Polas and food trays are also made out of these leaves. The leaves are used in decorating the supporting posts of the fale if visitors are coming and also placed over the roof of the fale when a hurricane is coming, in order to weight down the roof so that it will not blow away.

If the old dry leaves that have fallen off the trees were used, everything would be fine. But, only the green leaves are used. This means that the leaves have to be cut off the trees. An ordinary coconut tree has from twenty-four to thirty leaves on it with which it breathes and eats. The leaves of the tree do the same thing for the tree as your mouth does for you.

When green leaves are needed for any purpose, a young man or boy goes up the tree and cuts off three, four, or five leaves from one tree. Many trees have been seen having about twelve or fifteen leaves on them. This means exactly half of what there should be. What would happen to you if half of your mouth was sewn up tight so you could not use it? It would hurt you and you would have a hard time getting enough to eat, and if you did, you would have to be eating most of the time. This is exactly what happens to the coconut tree. With half the leaves the tree has to spend most of its time getting enough food to eat to keep alive so

it has no time to produce coconuts. Cutting off the leaves hurts the tree as well as allowing a new place for diseases to start, just like a scratch on your skin.

If at least twenty leaves were left on a tree it would do fairly well but never as well as if every leaf was left along. If the man up the tree would remove only one leaf from the tree and then another from a second tree things would be better. But, he does not do it. Also, the leaves are needed in Samoan life. Therefore, certain trees, about 30 for each family, should be set aside from which to obtain copra because they cannot do both. Never less than twelve leaves should be left on these trees or they will die. All other trees belonging to the family should not be touched. They should have all their leaves left on so they can produce large ripe coconuts for copra and food.

Unless the above is done, less and less copra will be produced in American Samoa as well as ripe nuts for food. Walk out in the farthest part of the plantation where no leaves are cut off the trees and see how much better they look as well as the great number of coconuts on those trees.

Article 7. O Le Fa'atonu, May, 1936.

4. Green Nuts. In many places in Samoa there is insufficient water for drinking purposes. Also, the water may not be good. For these reasons many green coconuts are used for drinking purposes.

From a survey made, an average of two green coconuts per day are used for drinking purposes. With 11,500

people this means 23,000 coconuts per day. In one year, or 365 days this makes 8,395,000 coconuts. If these nuts were allowed to ripen and copra made out of them, it would mean 1290 tons.

It is not the writer's idea that the drinking of green coconuts should stop. It is a necessary part of the Samoan life and has a lot to do with the good teeth to be found here. However, these figures are mentioned so that when Samoa needs more money some of these nuts can be left on the tree to be used later for copra.

When a tree is climbed to get the green nuts the young man or boy removes 4, 5, 6, or 7 nuts from the same tree. As he does so he is not as careful as he should be and the flowers which will later become more coconuts are often shaken and bruised. When this happens, these flowers will not produce as many nuts as they would have if they had not been touched, in fact, sometimes they will produce no nuts at all. Another thing that happens is that when the green nut is broken loose from its stem a raw open spot is left. Diseases can easily start in these open wounds. Breaking off this stem when it is green is also a shock to the tree and affects the number of nuts that that tree will bear.

Insofar as these nuts are considered necessary for drinking purposes, what can be done about it? In the previous article on coconuts, it was suggested that each family choose 30 trees to be used for leaf use, that is, the leaves removed from those trees only and no others. Now it is

suggested that green nuts for drinking be obtained from these same trees. These trees are not going to produce as well as all other trees because half the leaves will be removed anyway so a little more damage caused by removing the green nuts will not hurt a great deal more. When this is done no green nuts should be removed from other trees.

APPENDIX B.

USES OF THE COCONUT TREE AND THE COCONUT.

I. The Leaves

1. Shutters or Polas.
2. Baskets
3. Fans
4. Fish lures
5. Toys
6. Thatching
7. Mats
8. Food trays
9. Decoration
10. Brooms
11. Hats
12. Combs
13. Spoons
14. Toothpicks
15. Wrappers for fish
16. Cough medicine
17. Fishing torches
18. Operating knives
19. String

II. The Trunk

1. Posts for fales
2. Rafters in fales
3. Canes
4. Firewood
5. Fence posts
6. Ladders
7. Bridges
8. Pig sties
9. Spears

III. The Nuts

1. Drinking
2. Copra
3. Coconut oil
4. Food (Many forms)
5. Charcoal
6. Cups
7. Taro scraper
8. Breadfruit scraper
9. Water containers
10. Buttons
11. Pitching discus
12. Flower vase
13. Ash trays

IV. The Husks

1. Wash rag
2. Sennit
3. Coconut cream strainer
4. Firewood
5. Shoes
6. Corks
7. Fly switch
8. Tooth brush

APPENDIX C



A scene along the coast of Tutuila. Note the rapid rise of land almost immediately from the seashore.



A part of Pago Pago harbor. Note the rapid rise almost from high water mark. Very little land on Tutuila is level. Plantings must be made on these steep slopes.



The eastern end of the island of Ofu. Here again is seen the steep slopes which is typical of so much of American Samoa. Coconut trees can be seen along the shore.



The village of Vaitogi showing the fales and the large malae with the plantations surrounding the village.



A typical plantation scene. Coconut trees, banana trees, breadfruit trees and weeds growing together in profusion.

Coconut trees on the seashore. Note the notches in the trees as well as how close the trees are to one another.



Coconut trees in sandy soil. Note the few leaves on the tree to the left. Other leaves have been cut off for making baskets, shutters, and food trays. Most of these trees are very old.



Ripe coconuts piled up on stakes to dry. The young man is wearing the typical costume of a lavalava. In his left hand he holds a bush knife and in his right hand leaves of the ti plant.

Another view of the ripe coconuts piled on stakes for use as food or for planting.





The usual method of making copra in Samoa. Here the meat of the nut is drying in the sun. In the left background coconut leaves are drying to be made into shutters which can be seen in use on the fale in the right background.



The new method of making copra in Samoa. Here the meat of the nut is dried in a copra drier. This drier has been installed by the government at Futiga with surplus copra funds.



A young man sitting on a log to which a coconut scraper is attached. With this the ripe meat is scraped from which coconut cream is extracted by squeezing.

Copra storehouse in the village of Masefau.





Weaving coconut leaf baskets.



Typical coconut tree with the leaves showing damage by the coconut beetle.



The area in the foreground was formerly used for taro. This area is being allowed to lie fallow for a year or two. The growth is the mile-a-minute vine that can also be seen growing up on the trees in the background.

A clump of pandanus from which laufala mats are made.



Paper mulberry trees in the foreground. The bark of these trees is used in making tapa.



Scraping the paper mulberry bark. This is the first step in making tapa.



Painting the design on the tapa. To the left is the upeti(design board), in the bottle is the dye, and in the woman's right hand the coconut brush used in painting.



Wet land taro on the island of Aunu'u. In the background are Governor Dowling and members of his party. Also to be seen are the notches cut in the trunks of the coconut trees.



Two large kava roots brought in from the plantation for drying and later use in making the kava drink. The man is wearing the lavalava held up in this case with a belt.



Samoan swine. Typical animals in the outskirts of the village of Nu'u'uli. The pig wall keeps the animals in the village instead of out of it.

Pig pen out over Pago Pago harbor.



A "hurricane chicken", typical of a large majority of Samoan fowl.



Market day on the malae at the Naval Station. Note the coconut baskets of breadfruit, bananas and coconuts which are the principal native foods.



The Naval Station malae on boat day. Curios are spread out for sale to the tourists on the Oceanic Steamship liners.



Samoan carpenters working on the rafters of a new house. Note the use of an American clamp. The lumber held by the clamp is breadfruit.



The framework for a new fale. The old fale to the right will be demolished or converted into a cook-house.



A typical Samoan fale of the smaller type.



A Samoan long house which is the home of Chief Tufele, District Governor of Manu'a.



The paopao (Samoan outrigger canoe) used in quiet water for transportation and fishing.



The bonita boat, which is a very large outrigger canoe used in rough water for deep sea fishing.



A fine mat ceremony. The mats are paraded before the assembled populace before changing hands to build up prestige.



Samoan fine mat. This is a very old one evidenced by the frayed edges and worn spots. Fine mats represent wealth in Samoa.



The Fita Fita Guard and Band on the Naval Station Malae.



A few pigs ready for a Samoan feast. At times as many as two hundred animals are used at one feast.



A typical village school in American Samoa. Note the American flag, the children, and the school building. The fale on the right is the home of the teacher.



One of the concrete churches which have become popular in Samoa. Note the rusty corrugated iron roofing, the rather dark interior which means getting away from sunlight and fresh air.



Damage done to a Samoan fale in the hurricane of January 16, 1936. The fale is completely demolished. Fallen and damaged coconut trees are also noticeable.



Damage done to an American house in the hurricane of January 16, 1936.



Damage done to banana trees in the hurricane of January 16, 1936. Also notice slighter damage to coconut trees.



Banana trees at Feleti School two weeks after the hurricane of January 16, 1936. The trees were chopped off just below where they were broken. This is new growth since that time.



A breadfruit tree which was blown down in the hurricane on January 16, 1936. All limbs were cut off and the balance stood up and anchored back in the soil. A crop of breadfruit will be obtained from this tree two years sooner than if a new tree is planted.



A coconut tree after the hurricane of January 16, 1936. This tree will not bear again for 10 or 11 months.



The village water supply, shower, and laundry.
This picture was taken at Leone.



Fale laititi or lavatory over Pago Pago harbor.
This is the prevalent method of sewage disposal in
American Samoa.

GLOSSARY

<u>aiga</u>	relative
<u>aumaga</u>	society of untitled men
<u>Faifeau</u>	native pastor of the London Missionary Society
<u>fale</u>	house
<u>fau</u>	a tree of Samoa. The same as hau in Hawaii
<u>Fita Fita</u>	native Samoan in the United States Navy for Samoan duty
<u>fono</u>	council meeting
<u>kava</u>	a drink made from the kava root
<u>laufala</u>	pandanus. The same as lauhala in Hawaii
<u>lavalava</u>	cloth skirt wrapped around and twisted at the waist and reaching between the knees and the ankles
<u>malae</u>	village park or square
<u>malaga</u>	journey
<u>masi</u>	breadfruit or bananas stored in a ground pit and allowed to ferment
<u>matai</u>	titled man-chief or orator
<u>O Le Fa'atonu</u>	monthly government newspaper
<u>oso</u>	pointed digging and planting stick
<u>pa'apalagi</u>	a white person
<u>palusami</u>	taro leaves and coconut cream pudding
<u>paopao</u>	Samoan outrigger canoe
<u>pola</u>	coconut leaf shutter
<u>pule</u>	authority
<u>Pulenu'u</u>	village mayor
<u>siapo</u>	bark cloth

<u>tapa</u>	cloth made from the bark of the paper mulberry
<u>tapu</u>	forbidden by certain authority
<u>taulaga</u>	presents to high chiefs
<u>umu</u>	native oven
<u>upeti</u>	carved board used for painting designs on <u>tapa</u>
<u>fale laititi</u>	lavatory

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