1927.

NEW ZEALAND

MANDATED TERRITORY OF WESTERN SAMOA.

ANNUAL REPORT OF THE DEPARTMENT OF HEALTH FOR THE YEAR ENDED 31ST MARCH, 1927.

Presented to both Houses of the General Assembly by Command of His Excellency.

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REPORT.

The CHIEF MEDICAL OFFICER to HIS EXCELLENCY THE ADMINISTRATOR OF WESTERN SAMOA.

I HAVE the honour to submit the annual report of the Department of Health for the year ended 31st March, 1927.

T. RUSSELL RITCHIE,
Chief Medical Officer.

PUBLIC HEALTH.

The outstanding features in regard to the health of the community during the year were an outbreak of dysentery, due to the *B. dysenteriæ* shiga, in the early months of the year, and an influenza epidemic which spread rapidly throughout the Territory during August and September. In spite of the presence of the two diseases just mentioned, the death-rate for the year was the lowest, and the natural increase the greatest, on record. The ordinary routine work of the Department was interfered with to a considerable extent by these outbreaks, and also by changes in the staff.

During the year seven new out-stations, with Native nurses in charge, were opened. The provisions now made for medical assistance to Natives are as set out below.

All Natives receive free medical attention and treatment. The points at which such treatment is available are shown on map No. 1 accompanying this report. At the census of 1st January, 1926, the Native population of Western Samoa was 36,688, of which 24,052 were resident in Upolu and 12,636 in Savai'i. The distribution of this population, on which partly depends our arrangements for medical assistance, is very unequal. The topography of the country is another factor which has an inevitable effect on such arrangements. In the following account of the provision for medical assistance which has been made to date, the reference to districts refer to the numbers shown in the map accompanying this report :—

	Area.	Population.	Districts included.
Upolu—			
(*a*)	Apia Hospital area	15,807	1, 2, 3, 4, and western portion of 10.
(*b*)	Aleipata Hospital area	4,855	6, 7, 8.
(*c*)	Lefaga-Safata area	2,628	9 and eastern portion of 10.
(*d*)	Fagaloa Bay	762	5.
Savai'i—			
(*e*)	Tuasivi Hospital area	5,681	1, 2, 7A, 6B.
(*f*)	Safotu Hospital area	3,439	3A, 3B, 4.
(*g*)	Salailua-Asau area	3,516	5A, 5B, 5C, 6A, 7B.

(*a*) *Apia Hospital Area.*—The whole of this area is within easy reach of Apia by motor-car, and therefore the 15,807 Natives living in this area have the Apia Hospital within reasonable distance to them. This hospital is now well equipped to deal with any conditions likely to present themselves. It is adequately staffed, not only for the treatment of the sick but for the training of Native girls as nurses to staff the dispensaries in various out-districts. A number of Native boys are also under training as medical cadets, and, under arrangement with the Government of Fiji, the most suitable of these are sent there to undergo a course of training in their Native medical school. The hospital is now electrically lighted, and this year an X-ray plant presented by the New Zealand Government has been installed. The bacteriological laboratory is the largest and best equipped in the South Pacific islands. There are also four dispensaries in this area, in charge of Native nurses—at the Methodist Mission at Lufilufi, at the London Missionary Society's headquarters at Malua, at Mulifanua, and at Fasitootai.

(*b*) *Aleipata Hospital Area.*—The district hospital at Lalomanu, in the Aleipata district, was opened in April, 1924. It is in charge of a European Medical Officer, who has a staff consisting of an interpreter-dresser and two trained Native nurses. There is also a dispensary in charge of a Native nurse at Satalo, an outlying district in this area. Horses are kept at the hospital, to enable the Medical Officer to cover his district at frequent intervals.

(*c*) *Lefaga-Safata Area.*—This area is served by two dispensaries in charge of Native nurses, one in Safata and one in Lefaga.

(*d*) *Fagaloa Bay.*—This small area, with a population of 762, is isolated from the surrounding districts by high hills, and communication with the outside world is by means of boats or over very rough and steep tracks. During the year a Native nurse has been stationed here, with a small dispensary.

(*e*) *Tuasivi Hospital Area.*—The district hospital at Tuasivi, built in 1921, was the first out-station to be opened in Western Samoa. It is staffed in the same manner as the Aleipata Hospital. The area contains 45 per cent. of the population of Savai'i, and, although such areas appear large, communication with all parts is easy. A Native nurse is stationed at the Methodist Mission at Satupaitea.

(*f*) *Safotu Hospital Area.*—This area is a comparatively small one, bounded on either side by lava fields. It is in charge of a Native medical practitioner, who is assisted by a trained Native nurse.

(*g*) *Salailua-Asau Area.*—This is the most difficult area in Western Samoa to deal with. The population is scattered in small communities along a rocky coast-line with very few landing-places. Water-supplies and sanitation are both problems not easy of solution. For the past few years a nurse has been stationed at Salailua, the most thickly populated area, and this year stations in charge of nurses have been opened at Samataitai and Sataua.

The opening of dispensaries in the out-districts depends on our supply of trained Native nurses. Each year sees a further advance, and during the past year we were able to open six—at Fagaloa, Poutasi, Lefaga, Samataitai, Sataua, and Fasitootai—and in addition to station a Native nurse, trained in child-welfare work, at Fagamalo, Savai'i.

Infectious Diseases.

The return given below does not include all cases of infectious diseases occurring in the Territory, but only those which have been reported from Apia Hospital: Dysentery (shiga), 167; dysentery (amœbic), 1; pneumonia, 53; enteric fever, 21; leprosy, 5; pulmonary tuberculosis, 12; tubercular peritonitis, 2; tubercular meningitis, 1; gonorrhœa, 14; ophthalmia neonatorum, 1; beriberi, 2; tetanus, 3; puerperal sapræmia, 1; mumps, 1.

(*a*) *Dysentery.*—In February, 1926, an outbreak of dysentery (shiga) occurred in two villages in Savai'i, with a few cases in several other villages. Fortunately the steps taken to prevent it becoming epidemic were successful, but it was not until June that the outbreak subsided. Dysentery is endemic in Western Samoa, and has been so for over a century. At intervals of several years it has become epidemic, and has probably been one of the chief factors in the very slow increase in population. The last epidemic was in 1923, when it caused the death-rate to rise to 41·5 per thousand of mean population, as compared with a death-rate of 27 per thousand the previous year. The increased sanitation and cleanliness of the villages, the opening of dispensaries in outlying districts, and the education of the Natives all undoubtedly played their part in preventing the outbreak during 1926 from becoming epidemic.

(*b*) *Influenza.*—During August influenza of a mild but highly infectious type appeared in one of the villages on the outskirts of Apia, and rapidly spread throughout the Territory. Fortunately, information regarding the disease and advice as to treatment were circulated in advance of the epidemic in the more outlying districts. Of the twenty-five deaths which were returned as due to influenza, all but a few were of old people, the few being young adults who neglected to carry out instructions as to remaining in bed. This epidemic gave us a very satisfactory demonstration of the value of the women's committees in the villages. These committees were formed two years ago in connection with our child-welfare work, and during the epidemic they worked splendidly in caring for and treating the sick.

(*c*) *Measles.*—The last epidemic of this disease occurred in 1921. Since then sporadic cases have been seen from time to time, and during the year an outbreak occurred in a village several miles from Apia, but isolation of cases and of the village prevented its spreading to other areas.

(*d*) *Hookworm.*—During the year only 2,580 treatments for hookworm were given. The interference with ordinary routine work caused by the epidemics already mentioned, and by changes in staff, coupled with a very wet summer, are the factors causing the drop in numbers. Attempts to obtain a supply of hookworms during the year showed that even where they were present in patients they were very few in number.

(*e*) *Yaws (Frambœsia tropica).*—The systematic treatment of yaws throughout the Territory was commenced in April, 1923. Since that date 75,581 injections of Novarsenobillon have been given. Three injections are given to each case (at intervals of a week), and thus over 25,000 cases have been treated in the four years. The number of injections each year has been: 1923, 32,366; 1924, 21,222; 1925, 12,012; 1926, 9,981. The improvement in regard to the disease is really more marked than the figures indicate. To-day the majority of cases coming forward for treatment are cases of tertiary manifestations, the primary and early secondary cases being a very small minority of the total treated. Thus in one isolated district in Savai'i, with a population of 3,500, there were only three cases showing primary lesions, and fifteen showing early secondary lesions, in a total of 236 cases treated. Four years ago in this area the number of cases treated was 1,900.

Before systematic treatment was commenced practically every child contracted yaws before reaching the age of two years. Of the six thousand children under the age of four years in the Territory at the present time very few have had to be treated for this condition. Tertiary cases we shall have with us for a generation, but primary and secondary cases will rapidly become less and less and, we hope, will shortly disappear.

(*f*) *Leprosy.*—During the year no lepers were transferred to the Leper Asylum, Makogai, Fiji, but early in April seven will be transferred, making the total number of lepers from Samoa twenty-eight. The total comprises—Samoans, nine males and six females; Chinese, three males; half-caste Europeans, three males and three females; Solomon-Islanders, three males; and Cook-Islanders, one male.

Quarantine.

During the year eighty-eight vessels arrived from overseas. It was not found necessary to withhold pratique on any occasion.

Quarantine Intelligence Service.—Every week a wireless message from New Zealand gives us information as to the epidemic diseases present in that country, and also any information of value to us regarding other parts of the Pacific. The fortnightly cables regarding epidemic diseases received in New Zealand from London are posted to Western Samoa, but anything likely to be of importance is sent by wireless message.

The weekly returns broadcasted from the Eastern Bureau of the League of Nations Health Organization at Singapore are picked up by the wireless station in Apia, and the weekly fasciculus is received regularly from Singapore. For some time it has been realized that these returns, although valuable, do not give the island groups in the Pacific sufficient information. It is of great importance to us to know of the prevalence or otherwise of the minor epidemic diseases in the groups surrounding us and in communication with us. At the International Pacific Health Conference convened by the Government of the Commonwealth of Australia, and held in Melbourne in December, 1926, at which this Territory was represented, agreement was reached on the following points, subject to their ratification by the various Governments and Administrations concerned: (*a*) The collection and

distribution of epidemological intelligence in the Austral-Pacific zone; (*b*) quarantine procedure in regard to ships entering or trading in the zone; (*c*) a policy of co-ordinated research in the zone. The special intelligence system in the zone would supplement but not replace the work of the Eastern Bureau of the League of Nations Health Organization at Singapore.

Food and Drugs.

The New Zealand Food and Drugs Act, 1908, with the regulations made thereunder, is in force in the Territory. During the year the following foodstuffs were condemned and destroyed under the supervision of an officer of the Department: Meat in kegs, 7,630 lb.; canned meats, 1,005 lb.; butter, 86 lb.; olives, 48 lb.

Sanitation.

(*a*) *European.*—Permits issued, 52; water-closets installed, 27; sinks installed, 29; lavatory-basins installed, 10; cast-iron baths installed, 8; septic tanks constructed, 10; drainage, 1,448 ft.; number of loads of rubbish removed to dump, 1,440.

(*b*) *General.*—The following extracts from a report by the Assistant Inspector of Health (the Senior Inspector is absent on leave) show the work of the Department during the year:—

"A systematic inspection of European and Samoan premises within Apia district, comprising the villages of Apia, Alamagoto, Tanugamanono, Vaimoso, Lepea, and Vailoa, has been carried out through the year. Statistics of the work are given at the end of this report.

"Certain outlying villages have also been visited during the year. These include all villages in Faasaleleaga district, Savai'i, with the exception of Tafua and Tapueleele, and those from Vaiusu to Saleimoa inclusive in Upolu. Several of the latter are kept in good order, and are now showing the fruit of work done in the past years. In the others there is still need for great improvement in latrine accommodation and disposal of rubbish.

"The educational value on matters of sanitation of the regular inspections of the villages around Apia, together with the activities of the Village Committees, is shown by the following facts: (1) Many Samoans now remove their earth-closets without notification from the Inspector, and on removal pay attention to the fly-proofing of the building. (2) Free removal of unburnable rubbish, chiefly empty tins, in coconut-leaf baskets, to the roadside, for the rubbish contractor to pick up. This is done by the large majority of Samoan householders within the area covered by the contractor. (3) An increasing proportion of well-founded complaints as to nuisances, especially if the latter are near to the *fales*.

"Though this represents a distinct advance on Native sanitary conditions in this place a few years ago, there is still need for great improvement. Given regular supervision and active Village Committees it only needs time to obtain satisfactory sanitation in all villages in Samoa."

Inspection of premises, 4,294; re-inspection, 236; house closed for habitation, 1; nuisances discovered and rectified, 1,188.

In addition to the work of the departmental Inspectors, the Inspectors of the Agricultural Department report on the condition of the villages inspected by them.

Child Welfare.

Child-welfare work has been continued during the year under review, and most of the districts in Western Samoa have now been visited by the lady Medical Officer in charge of this work. A report by this officer was printed as an appendix in the last annual report. This year a report by Dr. Roberts (née Keyes) will be found in Appendix B. Dr. Roberts, the wife of the American Vice-Consul in Western Samoa, has voluntarily given her services in the district extending from Apia to Falefa, seventeen miles east. Her report shows what can be done when a district is given careful and regular supervision, and clearly indicates that marked improvement can be obtained in a short time under the conditions prevailing in that area. It is not possible for us to give the same amount of attention to every district, but as the education of the Native improves the results obtained in the area mentioned above should eventually be equalled and even improved upon.

The tables of weights at different ages up to two years show that the Samoan baby is on the average heavier than babies in New Zealand and the United States during the first several months of life, but that it drops back about the time of weaning and does not recover its position at the end of two years. It will be of interest in a few years' time to see if the work at present being carried out results in an improvement in the weight of babies from the time of weaning onwards.

The infant-mortality rate for the year shows a marked decrease in comparison with former years. Prior to 1923 the rate is not ascertainable, as the method of collecting information as to births and deaths did not permit of accurate statistics of age at death being obtained. Judging from the high death-rate, the infant-mortality rate must have been high. In 1923 it was approximately 200 per one thousand births; in 1924 it dropped to 155, probably as the result of the extension of medical facilities in the out-districts. In 1925 it rose to 186, the increase being due to an epidemic of whooping-cough. For the year just ended the rate was 106 per one thousand births, a rate which compares more than favourably with some European countries, but which we think is still too high for a country not cursed with many ills present in more civilized and more populous communities. Further improvement, however, is likely to be slow.

Vital Statistics (Samoan).

Population.

The census taken on the night of the 31st December, 1925–1st January, 1926, showed the Native population of Western Samoa to be 36,688, of which number 18,641 were males and 18,047 females. The movement of population during the year is shown below:—

NATIVE POPULATION, WESTERN SAMOA.

	Males.	Females.	Total.
At census of 31/12/25–1/1/26	18,641	18,047	36,688
Live births during 1926	1,056	909	1,965
Arrivals from overseas	427	300	727
Deaths during 1926	376	347	723
Departures for overseas	365	289	654
Population at 31st December, 1926 (estimated)	19,383	18,620	38,003
Natural increase	680	562	1,242
Excess of arrivals over departures	62	11	73
Total increase in population	742	573	1,315

The percentage increase in population during 1926 was 3·58 as compared with 3·26 in 1925 and 3·35 in 1924.

The arrivals from and departures for overseas tend to balance over a period of years. There is considerable traffic between Western Samoa and American Samoa, and to a lesser extent between Western Samoa and Fiji and Tonga, but there is no definite immigration or emigration on the part of Samoans.

Births.

The births of 1,965 living children were registered during 1926, giving the birth-rate per thousand of mid-year population of 52·62. For 1925 and 1924 the figures were 2,033 and 1,901, and the birth-rates 56·30 and 55·38 respectively.

BIRTHS OF SAMOANS, WESTERN SAMOA, 1926.

	Males.	Females.	Total.
Upolu	680	620	1,300
Savai'i	376	289	665
Total, Western Samoa	1,056	909	1,965

BIRTHS BY MONTHS, 1926.

—	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Males ..	86	69	97	77	96	90	108	103	104	87	68	71	1,056
Females	74	65	99	74	70	80	89	80	84	79	57	58	909
Total ..	160	134	196	151	166	170	197	183	188	166	125	129	1,965

Still-births, which are not included either as births or deaths in the various numbers and rates given in this report, increased from 37 in 1925 to 48 in 1926. The still-birth rate per 100 live births for the past four years has been: 1923, 1·23; 1924, 1·68; 1925, 1·82; and 1926, 2·44. The figure for 1923 is possibly too low, this being the first year in which the new system of registration of births and deaths came into force, and there may possibly have been doubt in the minds of Native officials as to recording them. The marked rise in 1926 may or may not have been due to the long dry spell in 1925 and the storm of the 1st January, 1926, both of which caused a shortage of Native food-supplies, and thus inevitably led to much extra work on the part of the women on the plantations and in fishing. The shortage of food was most acute during the first quarter of the year, and it is interesting to note in connection therewith that there was a decrease in the number of births in the fourth quarter.

Deaths.

The number of deaths registered during the year was 723, giving a death-rate per one thousand of mid-year population of 19·36. For 1925 and 1924 the deaths numbered 857 and 766, and the death-rates were 23·75 and 22·29 respectively. The death-rate for 1926 was the lowest on record, and the reduction is chiefly if not solely due to saving of child-life. This matter is more fully dealt with under "Child Welfare."

DEATHS OF SAMOANS, WESTERN SAMOA, 1926.

	Males.	Females.	Total.
Upolo	243	222	465
Savai'i	133	125	258
Totals, Western Samoa	376	347	723

DEATHS BY MONTHS, 1926.

—	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Males ..	30	25	27	38	45	48	30	29	35	32	17	20	376
Females	28	30	39	33	43	29	31	24	40	24	14	12	347
Total ..	58	55	66	71	88	77	61	53	75	56	31	32	723

AGES AT DEATH (SAMOANS), 1926.

—	0–1 Day.	1–2 Days.	2–3 Days.	3–4 Days.	4–5 Days.	5–6 Days.	6–7 Days.	Total 0–1 Week.	1–2 Weeks.	2–3 Weeks.	3–4 Weeks.	Total 0–1 Month.	1–3 Months.	3–6 Months.	6–12 Months.	Total under 1 Year.	1–2 Years.	2–3 Years.	3–4 Years.	4–5 Years.	5–10 Years.	Over 10 Years	Total.
UPOLU—																							
Males	4	0	0	0	2	1	1	8	1	2	1	12	6	14	41	73	38	11	9	7	7	98	243
Females	3	0	1	0	0	0	3	7	4	1	1	13	1	12	27	53	33	11	6	2	9	108	222
Total	7	0	1	0	2	1	4	15	5	3	2	25	7	26	68	126	71	22	15	9	16	206	465
SAVAI'I—																							
Males	2	2	1	2	1	1	0	9	4	2	1	16	3	4	23	46	10	4	0	3	3	67	133
Females	3	0	2	1	0	0	1	7	5	0	0	12	4	7	13	36	12	6	2	4	8	57	125
Total	5	2	3	3	1	1	1	16	9	2	1	28	7	11	36	82	22	10	2	7	11	124	258
TOTALS, WESTERN SAMOA																							
Males	6	2	1	2	3	2	1	17	5	4	2	28	9	18	64	119	48	15	9	10	10	165	376
Females	6	0	3	1	0	0	4	14	9	1	1	25	5	19	40	89	45	17	8	6	17	165	347
Total	12	2	4	3	3	2	5	31	14	5	3	53	14	37	104	208	93	32	17	16	27	330	723

Infant Mortality.

Prior to 1923 the system of registration of births and deaths did not permit of ascertaining the infant-mortality rate, but from the death-rates recorded it must have been high. In 1923 the rate was approximately 200, and in 1924 it fell to 155. Child-welfare work commenced in 1925, and during the first six months of that year the infant-mortality rate showed a marked improvement. During the second six months whooping-cough caused a rise in the number of deaths, making the rate for the year 186 per one thousand births. For the year under review the rate fell to 106. Thus two years' work on child welfare, coupled with four years' organized medical work in the out-districts, has already resulted in a marked improvement in the health of infants. The results are full of promise for the future.

The improvement is shown not only in the first year of life, but also in the succeeding years. In 1924, of a total number of deaths of 766, 51·4 per cent. were of children under the age of two years, and 59·3 per cent. under the age of five years. In 1925 the deaths numbered 857, of which 55·8 per cent. were of children under two years and 62·8 per cent. under five years. In 1926, of a total number of deaths of 723, the percentage under two years of age dropped to 41·64 and under five years to 50·63.

In connection with the percentages given above, it is necessary to note that the accurate returns which we have been able to obtain during the past four years show that 16 per cent. of the total population of the Territory is under the age of four years.

PERCENTAGE OF DEATHS AT DIFFERENT AGES TO TOTAL DEATHS.

—	Number of Deaths.			Percentage of Total Deaths.		
	1924.	1925.	1926.	1924.	1925.	1926.
Under 1 week	34	50	31	4·44	5·83	4·29
From 1 week to 1 month	25	36	22	3·26	4·20	3·04
From 1 month to 3 months	28	51	14	3·66	5·95	1·94
From 3 months to 6 months	44	100	37	5·74	11·67	5·12
From 6 months to 12 months	164	142	104	21·40	16·57	14·39
From 1 year to 2 years	99	97	93	12·93	11·32	12·86
From 2 years to 3 years	31	31	32	4·05	3·62	4·43
From 3 years to 4 years	29	29	17	3·78	3·38	2·35
From 4 years to 5 years			16			2·21
From 5 years to 10 years	25	28	27	3·26	3·27	3·73
Over 10 years	287	293	330	37·47	34·19	45·64
	766	857	723	100·00	100·00	100·00

Total Population of Western Samoa.

	Census, 1st January, 1926.	31st December, 1926.	Increase.
Europeans	2,498	2,552	54
Samoans..	36,688	38,003	1,315
Chinese labourers	890	947	57
Melanesian labourers	155	155	..
	40,231	41,657	1,426

In the above table—

"European" means any person other than a Samoan, with the exception of the Chinese and Melanesian labourers employed in Western Samoa, who are here shown under separate headings. Thirteen free Chinese, and their Chinese-Samoan descendants, are included.

"Samoan" means a person belonging to the Polynesian race, whether by pure or mixed descent; but does not include (*a*) persons registered as Europeans in accordance with any regulations or Ordinances in force in Western Samoa, or (*b*) the legitimate children of a father who is a European either by birth or by registration as aforesaid.

"Chinese labourers" means Chinese under contract to work for a term of years in Samoa, and includes also twenty-seven labourers who, by reason of long service in Samoa, have been permitted to remain here. (This refers to Chinese who were in Samoa prior to the British Military Occupation.)

"Melanesian labourers" means Solomon-Islanders who were brought to Samoa during the German occupation of this Territory for work on the plantations. The 155 shown are the few remaining, most of the Solomon-Islanders having been repatriated.

HOSPITAL AND DISPENSARY STATISTICS FOR THE YEAR ENDED 31ST MARCH, 1927.

	Hospitals.					Dispensaries.		Nationality of In-patients.		
	Apia.	Tuasivi.	Aleipata.	Safotu.	Totals, including Dispensaries and Travelling Units.	Stations, and Date of Opening if opened this Year.	Number of Attendances.	European.	Samoan.	Chinese.
(*a*) In hospital, 1/4/26	59	1	3	4	67	Fagaloa (Aug., 1926)	1,622	(*a*) 7	47	13
(*b*) Admitted during year	1,183	126	184	177	1,670	Fusi (Safata) ..	2,382	(*b*) 161	1,130	379
(*c*) Discharged during year	1,106	106	170	171	1,553	Gagaemalae ..	6,208	(*c*) 153	1,055	345
(*d*) Died	54	16	5	7	82	Lufilufi	5,203	(*d*) 5	71	6
(*e*) Remaining, 31/3/27	82	5	12	3	102	Malua	8,967	(*e*) 10	51	41
						Mulifanua.. ..	1,961	..	..	..
						Satalo (July, 1926) ..	4,041			
						Sataua (Aug. 1926) ..	2,062			
						Satupaitea ..	5,357			
						Vaiala	3,427			
						Lefaga (Nov., 1926)..	950			
Out-patient attendances, including dressings	24,116	6,599	7,382	9,997	96,452	Fasitootai (Dec. 1926)	2,222			
						Salega (Nov., 1926)..	2,533			
						Fagamalo (Jan., 1927)	1,423			
(*f*) Treatments for hookworm	36	1,118	334	50	2,580	Travelling units ..	1,042 (*f*)			
							2,943 (*g*)			
(*g*) Treatments for yaws (injections of novarsenobillon)	3,063	1,873	909	1,193	9,981					
Operations—Major ..	104	71	349	86	930					
Minor ..	320									

NOTE.—Chinese out-patient attendances (included in out-patient attendances) numbered 178.

The above figures do not include the children seen in our child-welfare work; cases attended to at mission stations where no nurse is stationed; the numbers visited by members of the staff; nor the thousands who were visited and treated in their own villages during the influenza epidemic of August and September.

REVENUE AND EXPENDITURE OF THE DEPARTMENT OF HEALTH FOR THE FIVE YEARS ENDED 31ST MARCH, 1927.

Financial Year (1st April to 31st March).	Total Expenditure of Department of Health.*	Percentage of Total Revenue of Territory.	Expenditure per Head of Population.†	Gross Revenue (Cost of Collection not deducted).				
				Subsidy from the New Zealand Government.	Native Medical Levy.	European Fees.	Chinese Fees.	Total Revenue of Department of Health.
	£		s. d.	£	£	£	£	£
1922–23‡	25,715	19·6	14 1·2	12,500	2,790		4,299	19,589
1923–24	23,995	17·9	12 10·4	12,500	7,327	2,814	2,023	24,664
1924–25	24,425	18·7	13 0·2	14,000	7,705	1,461	1,140	24,306
1925–26	25,761	17·2	12 11·1	14,000	9,186	1,705	1,603	26,494
1926–27	26,022§	..	12 6·9	..	..	..	..	..

* Expenditure shown does not include interest and sinking fund on capital expenditure, cost of repairs to buildings, and miscellaneous expenditure under head XV of general estimates, such as travelling-expenses of officers on leave, &c. Expenditure under these heads does not come under the control of the Department of Health.

† Average population taken as the population as at 30th September each year.

‡ Medical levy not in force. It was during this year that the Natives brought forward the proposal that a medical levy be enforced and free treatment instituted. This was agreed to, and came into force on the 1st April, 1923.

§ Figures only approximate, as final Treasury returns not yet received.

REPORT OF THE RESIDENT MEDICAL OFFICER OF THE APIA HOSPITAL, 1926.

ADMINISTRATION.

The hospital buildings, including the Sisters' Home, have been painted throughout during the last year, making a very noticeable improvement. The whole of the hospital is now electrically lit, and with few exceptions the plant has worked well. At one period the load was too great for the engine, so three outside houses which were supplied by our plant were transferred to the Apia main, giving far better lighting in the hospital. Very shortly we shall be supplied from the turbine at the Motootua Ice-works, which will give us an all-night supply, instead of only five hours as at present. Our own plant will be retained to enable us to run the X-ray apparatus at will, and also as a stand-by in case of a shortage of water during the dry season.

It has long been recognized that the present maternity department attached to the European hospital is inadequate, being too near the other wards and the road; besides which there are not enough private wards to accommodate other female patients. Plans are now prepared for a new maternity department on the north-west corner of the European block, consisting of a labour-room, two convalescing-rooms, sink-room, sterilizing-room, offices, &c., and this will be commenced early in March, and will be a great improvement.

Owing to the expansion of our Samoan nursing staff a new *fale* has been found necessary, and at the time of writing is about completed. This will enable us to accommodate twenty-seven nurses. The *fale* is situated nearer the Ifi Ifi Road than the other two *fales*, and is built on higher ground. A new shower and lavatory will be added to the existing buildings, and these additions should provide ample accommodation for years to come, and should provide comfortable quarters for the Samoan nurses.

The hospital has up to now been supplied with water from two sources, Vailima and the Apia main. The latter was very unsatisfactory, failing when most wanted, so during the last two months of the year all the buildings have been connected up with the Vailima supply. The Samoan nurses' quarters, the Sisters' Home, and the Resident Medical Officer's residence are thus assured of a constant supply of water with ample pressure.

It has been felt for a long time that the food problem was a serious one for patients coming to the Samoan Hospital from a distance. Many cases have not been able to avail themselves of the necessary treatment on this account; so it was decided to evolve a scheme to meet this difficulty, and it was considered that the only solution was the acquiring by the Medical Department of sufficient land in the vicinity of the hospital to provide both housing and food for patients. As a result, during the latter part of the year, two properties have been acquired, totalling nearly 14 acres. Of this area 8 acres is just beyond the Resident Medical Officer's house, and the remainder is continuous with the southern boundary of the hospital grounds, containing on it a well-built wooden house. The 8 acres were cleared by the end of the year and planted in breadfruit, taro, and bananas. The work was begun by the boys from Avele and Malifa Schools, and finished by the teachers attending the refresher course at Malifa School. Owing to good rains since planting the crops are already well established, and we can confidently look for good results during the latter part of 1927. Later on, when a suitable area near the hospital can be found, it is proposed to build a village of Samoan *fales* (houses).

The scheme as outlined above necessitates a place of residence for the attendants and patients coming from a distance, and the idea is that two attendants shall accompany each patient, one of whom will stay with the patient in the hospital, whilst the other lives in the village, working on the plantation in return for the food supplied to him and the patient. It is confidently anticipated that this scheme will be a success, the chief obstacle in sight being the difficulty of obtaining suitable land for the purpose near the hospital.

The housing of married members of the hospital medical staff has up to now been a very difficult matter, as so few suitable houses are available, and, if so, are too far away. The problem has been most successfully solved by renovating the house on the property at the southern end of the grounds, which provides us with three good residences all within a very short distance of the hospital. We hope in time to have a hospital telephone system, which will still further simplify matters.

The maternity *fale* at the Samoan end was opened in July last, and has proved an unqualified success, no fewer than eighteen maternity and gynæcological cases having presented themselves. Of these six were normal labours, and have been of very great benefit to our nurses. The maternity sister is in charge, assisted by a trained Samoan nurse, who is also sub-matron of the Samoan nurses. The maternity sister lectures once a week to the nurses on elementary midwifery, and this, with the practical experience gained, will enable us shortly to send our nurses to the out-stations trained in every branch of their profession.

STATISTICS.

The analysed hospital statistics, as in last year's report, are compiled for the calendar year 1926.

TREATMENT—MEDICAL.

At the end of February an epidemic of dysentery commenced, and lasted on until July. In all 113 cases were admitted, with thirteen deaths. As previously noted, in Western Samoa the type was exclusively bacillary, and shiga was the organism, but not of a very virulent type. Most of the deaths were due to delay in coming to hospital. There were a number of cases in the villages round both islands. No sooner had the dysentery epidemic settled down than a mild form of influenza took its place, and eighty-two were admitted suffering from it. A large number of our Samoan staff were affected, but there was no death from this cause. Lobar pneumonia accounted for forty-six admissions, with five deaths, but there were very few cases of broncho-pneumonia.

Yaws are still decreasing, the number of injections being 798 less than last year, and one only has to look round the villages to see the improvement that has taken place.

Admissions due to the enteric-fever group are small in number, but with one exception all gave a positive Widal reaction.

Treatment—Surgical.

Major operations again show a falling-off, with abscesses heading the list. A large number of cases of hydrocele, &c., have been operated upon in Aleipata under local anæsthesia, a form which seems to be very popular with Samoans. The same routine is now being followed in this hospital, and it is expected that our returns will show a marked increase next year. With an improved technique, this form of anæsthesia appears to be ideal.

Chinese Coolies.

Although the total returns for the year are just below last year, there has been a decided increase in the number of admissions to hospital, some due to beriberi, of which we have had twenty-four cases, with one death. All these cases arrived by the Chinese transport in August, and most of the cases were mild, but even then recovery is often tedious, and diagnosis in the early stages is far from easy.

Apia Hospital—Attendance, Operations, etc., for the Year 1926.

General attendance (includes out-patient attendance, out-patient dressings, N.A.B. injections, and injections for elephantoid fever)		27,479
Out-patient attendance (European and Samoan)		11,888
Out-patient dressings (European and Samoan)		12,044
N.A.B. injections—		
First injections	1,173	
Second injections	1,116	
Third injections	1,042	
		3,331
Injections for elephantoid fever		21
European in-patients		150
Samoan in-patients		669
Chinese and Melanesian in-patients		384
Chinese and Melanesian out-patients		213
Operations—		
Major		95
Minor		156

Report on the Laboratory, Government Hospital, Apia, 1926.

The following report covers a period of nine months (1st April to 31st December). This is in order to come into agreement with the General Hospital report—viz., 1st January to 31st December (inclusive). The first three months of the year were included in last year's report.

Several welcome additions to apparatus have been made, including a water-driven centrifuge and dark-field illuminator.

We are still dependent upon kerosene-heating, but a Spenser's petrol-gas generator has just come to hand, and at time of writing is being installed. With this completed we shall be able to obtain a new incubator and autoclave to replace the present kerosene-heated ones, which are inadequate to cope with the demand, while the advantage of Bunsen burners on the working-benches will be inestimable.

At the request of Professor Hercus, Otago University, New Zealand, samples of Samoan vegetable products were sent for iodine estimation in connection with his work on goitre. Unfortunately, samples of bananas and taro were unsuitable for analysis on arrival, but some of the results reported are very interesting. A sample of yam contained 6 parts of iodine per 100,000,000, which is a typical result for New Zealand vegetables of that type. Samples of garden-soil gave 240 parts of iodine per 10,000,000, while the plantation soil sent gave 200 parts per 10,000,000. Professor Hercus states that typical goitrous areas in New Zealand show a soil content of only 30 parts iodine per 10,000,000. It is proposed in future to send monthly supplies of vegetable products, &c., for investigation, to ascertain if possible any seasonable variation in the results. A number of sera from yaws patients have also been sent to the Dunedin Laboratory, where both Wassermaun and Kahn's Precipitin tests have been performed. All the sera from patients who came up for injection were positive in a very high dilution. Provision has now been made in this laboratory for carrying out systematic tests on these cases, especially with a view for observing results after treatment.

The number of hospital "routine" specimens recorded is 1,341, of which twenty-nine were from patients seen by the visiting Medical Officer, and one from the hospital at Tuasivi, Savai'i. The specimens comprise the following:—

Blood specimens: Total cell counts, 54; differential counts, 54; hæmoglobin estimations, 8; blood cultures, 2 (negative); filarial examinations, 6 (positive); Widals—positive *B. typhosus*, 14; positive *paratyphosus B*, 3; blood-sugar estimations, 3.

Urines: Positive albumin, 139; positive sugar, 12; positive blood, 40; positive bile, 6; positive pus, 106; positive casts, 19; urea estimations, 1; quantitative albumin, 3; containing organisms—tubercle bacilli, nil; streptococci, 3; staphylococci, 3; *B. Coli*, 22.

Fæces: For hookworm ova (positive), 57; for *Ascaris* ova (positive), 12; for *Trichuris* ova (positive), 28; adult worms—hookworms, 2; *Ascaris*, 2; for organisms—*Bacillus dysenteriæ* shiga, 18.

Sputa: All specimens were, as a routine, examined for T.B. and other organisms. Number examined, 84; positive for T.B., 9. One sputum contained streptothrix organisms in abundance.

Puncture fluids: C.S.F., 1 (negative); other specimens, 7 (1 streptococcal).

Miscellaneous swabs: Containing streptococci, 4; containing staphylococci, 17. One specimen obtained from a soft sore showed organisms morphologically resembling Ducrey's bacillus.

Venereal examinations: Number examined, 43; urethral smears (positive), 32; cervical smears (positive), 8; vaginal smears (positive), 5.

Leprosy: Number examined, 6; nasal smears (positive), 1; scrapings from skin (positive), 1.

Vaccines: Autogenous, 15; stock, 12.

Tissue for sectioning, 15.

In addition, samples of beer, &c., have been received for analysis, as follows: Customs Department, 5; Police Department, 19. The police cases take up a comparatively large amount of time, as in every case it entails giving evidence at the Courthouse.

APIA HOSPITAL.—CLASSIFIED ADMISSIONS TO EUROPEAN WARDS.

——	Remaining in Hospital.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	Deaths.
Alimentary System.															
Appendicitis	..	..	1	..	..	1	..	..	..	..	..	1	..	3	..
Colic	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Constipation	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Gastritis	..	1	1	1	2	1	..	..	..	..	1	..	..	7	..
Gastro-enteritis	..	1	..	..	1	1	..	..	..	..	..	..	..	3	1*
Malnutrition	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Circulatory System.															
Adenitis	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Cardiac	..	..	..	..	..	..	..	..	..	..	1	1	1	3	1
Melaena	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
P.U.O.	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Genito-Urinary System.															
Abortion	..	1	1	..	..	..	..	..	..	..	1	1	..	4	..
Circumcision	..	..	..	..	..	..	..	..	1	..	1	..	1	3	..
Confinements	..	1	1	2	1	2	..	1	..	2	2	1	..	13	..
Curettage	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Cystitis	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Hydrocele	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Orchitis	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
Nephritis	..	..	..	..	..	..	..	..	..	1	1†	..	1†	3	..
Parametritis	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Nervous System.															
Neuritis	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..
Locomotor ataxy	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..
Respiratory System.															
Bronchitis	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..
Laryngitis	..	..	..	..	..	..	..	1	..	..	..	..	..	1	1*
Pneumonia, lobar	..	..	..	1	1	..	..	..	..	..	..	..	..	2	..
Phthisis	..	1	..	..	1	..	..	1	..	1	..	..	..	4	..
Tonsilitis	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Skin and Subcutaneous Tissues.															
Cellulitis	1	..	..	..	1	2	..	..	..	..	..	..	..	4	..
Dermatitis	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Furunculosis	..	..	..	..	..	..	1	1	1	..	1	..	..	4	..
Myositis	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
Ulcers	..	..	..	..	..	..	..	1‡	..	..	..	..	..	1‡	..
Supporting Structures.															
Abscess	..	2	..	..	..	1	2	1	..	3	1	..	..	10	..
Bone-osteo-myelitis	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
Fractures	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..
Injuries (cuts)	2	..	..	..	..	1	..	..	3	2	1	2	1	12	..
Whitlow (tendon)	..	1	..	..	..	..	..	..	..	..	..	..	1	2	..
Wounds, septic	..	..	..	..	..	..	1	1	..	..	..	..	..	2	..
Special-sense Organs.															
Conjunctivitis	..	..	..	1	..	..	..	..	..	1	..	..	..	2	..
Injury to eye	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..

* Moribund on admission. † Readmission. ‡ Duodenal.

APIA HOSPITAL.—CLASSIFIED ADMISSIONS TO EUROPEAN WARDS—*continued.*

—	Remaining in Hospital.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	Deaths.
Infectious Diseases.															
Chicken-pox	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Dysentery, bacillary ..	..	..	..	3	..	2	1	..	..	..	1	1	..	8	..
Enteric-fever group ..	..	..	..	..	..	1	..	..	..	..	1	..	..	2	..
Influenza	..	..	..	3	1	..	3	1	14	2	1	1	1	27	..
Tetanus	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1*
Parasites.															
Ascariasis	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Hookworm	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
General.															
Poisoning	..	..	..	..	..	..	..	..	..	1†	..	..	..	1†	..
Rheumatic fever ..	..	..	..	..	..	..	..	..	..	..	..	..	1‡	1‡	..
Tumors.															
Carcinomata (clinical) ..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Fibromata	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Totals ..	6	11	7	14	10	17	11	9	21	14	14	8	8	150	5

* Shortly after admission. † Ptomaine. ‡ Gonorrhœal.

APIA HOSPITAL.—CLASSIFIED ADMISSIONS TO THE SAMOAN WARDS.

—	Remaining in Hospital.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	Deaths.
Alimentary System.															
Colic	..	..	2	5	1	2	1	1	..	..	..	1	1	14	..
Colitis	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Constipation	..	1	..	1	..	..	..	..	..	..	..	1	1	4	..
Diarrhœa	..	..	2	2	4	1	3	..	..	..	..	..	1	13	..
Gastritis	..	..	..	..	..	1	..	1	..	1	2	..	..	5	..
Gastro-enteritis ..	1	3	4	3	1	2	..	..	1	..	1	1	6	23	4
Hæmorrhoids	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Hare-lip	..	..	..	1	1	..	1	..	..	..	..	..	..	3	..
Hernia	..	..	..	1	1	..	1	..	..	..	..	..	..	3	..
Intestinal obstruction ..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1*
Jaundice	..	..	1	1	1	1	..	..	..	..	..	..	..	4	1†
Marasmus	2	2	2	..	4	..	8	1	..	4	..	..	..	23	1
Stomatitis	..	..	..	..	..	..	..	1	..	1	..	..	..	2	..
Tuberculosis	..	..	..	1	..	1	..	1	..	..	1	..	..	4	..
Circulatory System.															
Adenitis	..	1	..	1	2	..	..	..	..	1	2	1	..	8	..
Cardiac	..	2	..	..	..	..	1	..	..	..	..	..	..	3	2
Cerebral hæmorrhage ..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Lymphangitis ..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..
Genito-urinary System.															
Abortion	..	..	1	2	4	..	..	1	1	1	2	1	..	13	..
Confinements	1	1	..	2	..	..	..	2	1	4	3	..	..	14	..
Cystitis	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Eudometritis	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
Glycosuria	..	..	..	1	..	1	..	..	..	..	..	..	..	2	..
Gonorrhœa	5	..	..	..	..	..	..	..	..	..	..	1	..	6	..
Hydrocele	..	..	..	1	1	..	..	1	..	1	..	..	..	4	..
Mastitis	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Nephritis	..	..	..	..	..	2	..	..	..	..	1	..	..	3	..
Orchitis	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Parametritis	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Pyelitis	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
Retention of urine ..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..
Uterine displacement ..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..
Urethritis	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..

* Volvulus. † Same day.

APIA HOSPITAL.—CLASSIFIED ADMISSIONS TO THE SAMOAN WARDS—*continued.*

—	Remaining in Hospital.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	Deaths.
Nervous System.															
Chorea	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Concussion	..	..	..	..	1	..	..	..	1	..	..	..	1	3	..
Meningitis	..	..	1	..	2	1	..	..	..	..	..	..	..	4	..
Respiratory System.															
Bronchitis	1	..	5	1	..	1	1	4	4	1	1	2	..	21	..
Broncho-pneumonia ..	..	1	1	2	..	1	..	..	..	..	..	..	..	5	1
Empyema	..	1	..	..	..	..	..	..	..	..	..	..	..	1	1
Laryngitis	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
Phthisis, pulmonary ..	..	..	1	1	..	1	..	1	1	1	1	..	..	7	..
Pleurisy	..	..	1	..	2	3	..	..	1	1	1	..	..	9	..
Pneumonia, lobar ..	1	4	6	3	2	5	..	3	6	10	2	4	1	47	7
Tonsilitis	..	..	..	..	..	..	..	1	..	..	..	1	1	3	..
Neoplasms.															
Fibroma uteri.. ..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Skin and Subcutaneous Tissues.															
Burns	..	..	..	1	..	..	..	5	..	..	..	..	..	6	1
Cellulitis	..	1	..	..	..	1	..	1	..	..	..	..	..	3	..
Carbuncle	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Dermatitis	..	1	..	..	..	..	1	..	..	..	..	..	..	2	..
Elephantoid scrotum ..	..	2	..	1	..	..	..	1	..	..	..	..	..	4	..
Furunculosis	..	..	1	..	..	..	2	..	..	1	..	..	..	4	..
Lipoma	..	..	..	1	..	..	..	1	..	..	..	..	..	2	..
Ulcers	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
Supporting Structure.															
Abscess	2	5	3	4	7	5	3	3	3	4	3	3	6	51	..
Arthritis	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..
Bone-necrosis	..	..	..	..	..	1	1	1	..	..	1	..	1	5	..
Fractures	..	..	..	..	..	..	..	..	1	1	..	..	..	2	..
Injuries (accidents) ..	1	7	6	1	6	5	7	5	1	4	2	8	3	56	2
Myositis	..	..	1	..	..	..	..	..	..	..	2	1	1	5	..
Periostitis	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Special-sense Organs.															
Conjunctivitis.. ..	..	..	..	1	..	1	1	1	..	..	..	..	..	4	..
Evisceration of eye ..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..
Iritis—Corneal ulcer ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..
Otorrhœa	..	..	..	..	1	..	..	..	2	..	..	1	..	4	..
Parasites.															
Ascariasis	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..
Filariasis	..	..	..	..	1	1	1	2	1	..	..	..	1	7	..
Hookworm	..	..	1	..	..	..	..	1	..	..	..	..	..	2	..
Infectious Diseases.															
Dysentery, bacillary ..	..	..	2	31	31	26	10	8	1	1	..	3	..	113	13
Enteric-fever group ..	..	1	..	1	..	1	1	3	..	..	..	3	..	10	..
Influenza	..	..	..	..	..	..	..	1	44	10	..	..	..	55	..
Leprosy	3	..	..	..	..	..	..	..	..	..	..	..	..	3	..
Puerperal fever ..	..	..	..	..	..	..	..	1	..	..	..	..	1	2	..
Tetanus	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Yaws	..	1	2	1	1	..	1	..	1	..	..	..	..	7	..
General.															
Dental extractions ..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Poisoning (ptomaine) ..	..	..	5	..	1	..	..	..	..	1	1	..	..	8	..
P.U.O.	1	1	1	8	3	6	1	2	2	4	3	..	..	32	1
Collapse	..	..	..	1	..	..	..	1	..	..	..	..	..	2	..
Totals ..	20	38	49	84	79	73	46	55	76	55	32	35	27	669	36

APIA HOSPITAL.—CLASSIFIED ADMISSIONS TO CHINESE WARDS.

—	Remaining in Hospital.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	Deaths.
Alimentary System.															
Colic	..	..	1	..	..	..	..	1	1	..	..	..	..	3	..
Constipation	..	1	..	..	..	3	2	1	..	..	..	..	1	8	..
Diarrhœa	..	..	1	1	3	3	2	1	..	1	2	..	3	17	..
Gastritis	..	..	..	..	..	..	..	..	..	1	2	..	..	3	..
Hæmatemesis	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
Jaundice	..	..	..	..	1	1	..	..	..	..	..	..	..	2	..
Strangulation by band	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1*
Circulatory System.															
Adenitis	..	1	..	..	1	..	..	..	..	1	1	1	1	6	..
Anæmia	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Cardiac	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1
Mumu	1	..	1	..	1	1	..	..	2	..	..	..	1	7	..
Rheumatism—Arthritis	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..
Genito-urinary System.															
Cystitis	..	..	1	..	1	..	..	..	..	..	..	..	..	2	..
Gonorrhœa	..	..	..	1	..	..	1	..	2	..	..	1	..	5	..
Nephritis	..	..	..	1	..	..	..	..	..	1	..	..	..	2	..
Orchitis	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Nervous System.															
Lumbago	..	..	..	..	2	..	1	..	..	..	..	..	..	3	..
Respiratory System.															
Bronchitis	..	1	1	..	..	2	..	2	2	1	1	1	..	11	..
Cough, U.O.	..	..	..	..	..	1	1	..	..	..	..	..	..	2	..
Phthisis, pulmonary	2	..	2	..	..	..	..	..	..	1	..	..	..	5†	..
Pneumonia	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Tonsilitis	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Skin and Subcutaneous Tissues.															
Boils	..	2	..	3	2	2	1	..	1	1	2	..	..	14	..
Burns	..	..	..	..	1	..	..	..	..	..	1	..	..	2	..
Cellulitis	..	1	1	..	..	..	1	..	..	..	..	..	..	3	..
Cuts and wounds, septic	..	1	5	2	2	2	8	7	2	4	11	5	2	51	..
Dermatitis	..	1	2	1	2	..	1	3	1	1	1	2	2	17	..
Herpes zoster	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Ulcer	4	1	1	1	..	2	2	7	2	2	1	3	1	27	..
Supporting Structures.															
Abscess	1	..	2	1	4	1	1	2	2	3	2	..	3	22	1
Fractures	..	2	..	..	..	..	..	..	..	2	..	1	..	5	..
Injuries (accidents, &c.)	1	3	4	4	3	4	1	1	1	1	4	..	5	32	..
Synovitis	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Infectious Diseases.															
Beriberi	6	..	..	..	..	..	..	..	22	2	..	..	..	30	..
Dysentery	..	..	..	..	..	2	1	..	..	..	..	..	..	3‡	..
Enteric-fever group	..	..	1	2	..	..	1	..	..	..	..	..	..	4	2§
Influenza	..	..	1	..	..	1	1	3	3	3	..	..	..	12	..
P.U.O.	..	1	1	4	2	1	1	..	..	1	1	..	2	14	..
Yaws	..	2	..	..	..	..	..	2	..	..	..	..	..	4	..
Special-sense Organs.															
Conjunctivitis	..	3	1	1	1	2	2	1	1	1	..	1	1	15	..
Corneal ulcer	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Parasites.															
Hookworm	..	..	..	3	..	..	..	..	..	..	..	..	..	3	..
General.															
Malingering	..	..	..	..	..	..	..	1	..	..	1	..	..	2	..
Mental	..	..	..	..	..	..	..	..	1	1	..	..	..	2	..
Poisoning	..	..	..	..	..	..	..	..	1	..	..	..	..	1‖	..
Totals	17	21	27	25	27	29	28	32	45	29	32	17	22	351	5

* Duodenal. † Laryngeal. ‡ Shiga. § Typhosus. ‖ Centipede.

Apia Hospital.—Admissions of Melanesian Labourers.

——	Remaining in Hospital.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	Deaths.
Abscess	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..
Arthritis	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Boils	..	..	..	..	1	1	..	..	..	..	..	..	..	2	..
Bronchitis	..	..	1	..	..	..	..	1	..	..	..	..	..	2	..
Conjunctivitis and iritis	..	..	..	1	..	..	2	..	..	..	1	..	..	4	..
Corneal ulcer	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Diarrhœa	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Dysentery	..	..	..	..	1*	..	..	..	..	..	..	..	..	1*	..
Enteric-fever group	..	..	..	1	..	1	..	..	..	..	..	..	..	2	..
Filariasis	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Fracture	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Glands, septic	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Herpes zoster	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..
Influenza	..	..	..	..	..	..	..	1	1	..	..	..	..	2	..
Injury	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Lumbago	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Pleurisy	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
Phthisis	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1†
Pneumonia	..	..	..	..	..	..	..	..	1	1	..	..	..	2	..
P.U.O.	..	..	..	4	1	..	..	..	..	..	..	..	..	5	..
Stomatitis	..	1	..	1	..	..	..	..	..	..	..	..	..	2	..
Yaws	1	1	..	..	..	..	..	..	..	1	..	..	..	3	..
Totals	4	5	2	7	4	2	2	3	3	2	3	1	..	38	1

* Shiga. † Hindu.

Apia Hospital.—Surgical Operations performed under General Anæsthesia.

Surgical Operations.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
On skin and cellular tissues—													
Abscess	1	..	4	2	4	2	1	1	..	2	1	2	20
Lipoma	..	1	..	..	..	..	1	..	..	..	..	..	2
Sebaceous cyst	..	..	..	..	..	..	..	..	..	..	..	1	1
Wounds sutured	..	..	..	..	..	..	..	..	..	..	1	2	3
On bones—													
Amputations	..	..	..	..	..	..	..	..	..	2	2	1	5
Necrosis	..	1	..	..	2	1	1	..	..	2	1	2	10
On eye—													
Evisceration	..	..	..	..	..	..	..	..	..	..	..	2	2
On ear, nose, and throat—													
Tonsils and adenoids	..	..	..	..	..	..	..	..	..	..	..	1	1
On abdomen—													
Appendicectomy	..	..	..	..	..	..	..	..	..	..	1	..	1
Laparotomy	..	1	..	..	..	..	..	..	1	..	..	..	2
Radical cure of hernia	..	..	..	2	..	2	..	..	..	..	..	..	4
On male organs—													
Amputation elephantoid scrotum	2	..	3	..	..	..	1	..	..	..	..	..	6
Circumcision	..	1	2	..	..	..	1	1	..	2	..	1	8
Urethrotomy	..	..	1	..	..	..	..	..	..	..	..	..	1
Hydrocele, radical cure	..	..	..	..	..	..	1	1	1	..	..	..	3
On female organs—													
Curettage	1	1	1	1	1	..	1	1	..	2	1	..	10
Difficult labour	1	..	1	..	2	..	3	..	5	1	1	..	14
General—													
Examinations under anæsthetic	..	..	..	..	1	..	..	..	..	..	..	1	2
Totals	5	5	12	5	10	5	10	5	6	11	10	11	95
Minor surgical operations—													
Chiefly under local anæsthetic	26	11	17	11	16	14	13	5	12	8	7	16	156

APPENDIX A.

METEOROLOGICAL REPORT OF APIA OBSERVATORY, 1926.

(To which has been added a column showing number of deaths per month.)

Month.	Atmospheric Pressure (in Inches of Humidity).		Temperature (° F.).						Mean Relative Humidity.			Rainfall, in Inches.		Number of Days without Rain.	Hours of Bright Sunshine daily.	Number of Deaths per Month.
	Normal over Period of 34 Years.	Mean for Month (1926).	Normal for Month (Mean of 34 Years).	Mean for Month (1926).	Absolute Maximum.	Absolute Minimum.	Greatest Daily Range.	Least Daily Range.	7 a.m.	2 p.m.	9 p.m.	Normal (over Period of 34 Years).	Total for Month.			
January ..	29·764	29·757	79·01	80·49	90·5	71·1	17·1	5·0	86·6	75·8	86·8	16·81	10·94	12	6·3	58
February ..	29·778	29·748	79·00	81·05	89·2	75·0	12·6	5·2	88·1	76·5	89·9	15·71	9·85	9	4·6	55
March ..	29·800	29·795	79·34	79·82	88·9	71·8	14·0	5·0	90·3	81·9	90·3	13·54	15·79	7	4·5	66
April ..	29·822	29·862	78·91	79·55	88·2	69·8	15·3	3·1	87·7	75·3	86·3	10·24	5·30	19	5·8	71
May ..	29·858	29·875	78·40	79·78	88·5	70·9	15·7	9·5	88·6	74·5	87·7	5·51	1·24	23	8·2	88
June ..	29·874	29·900	77·80	79·28	89·4	67·3	18·0	5·0	87·5	74·3	84·0	5·16	5·84	22	7·4	77
July ..	29·884	29·887	77·20	78·71	87·4	67·5	16·6	4·0	86·6	76·4	84·3	2·64	4·55	20	8·0	61
August ..	29·890	29·933	77·80	80·00	88·3	70·2	15·3	6·3	84·2	73·9	83·1	3·15	3·80	20	7·8	53
September ..	29·888	29·910	78·21	80·04	87·6	71·2	16·2	5·4	87·0	76·0	83·0	5·12	3·32	20	7·8	75
October ..	29·868	29·859	78·42	79·26	88·0	66·2	19·3	7·9	75·6	68·5	75·5	6·06	6·87	23	8·4	56
November ..	29·810	29·823	78·69	79·61	87·8	72·3	13·7	6·5	89·3	78·8	89·8	9·29	14·20	6	5·9	31
December ..	29·777	29·819	79·25	79·48	88·5	72·5	14·2	5·4	87·8	80·9	88·1	13·62	21·87	9	5·6	32
Mean per year	29·834	29·847	78·48	79·76	88·52	70·48	15·07	5·69	86·6	76·1	85·7	89·00	8·63	158	6·7	..

Highest temperature, 90·5° F. on 11th January; lowest temperature, 66·2° F. on 10th October. Rainfall for year, 103·57 in.; normal over a period of thirty-four years, 106·85 in. Greatest rainfall in twenty-four hours, 5·69 in. on 1st January. Number of days without rain, 190. (NOTE: Normal is based on thirty-four years observations—1890–1923 inclusive.)

APPENDIX B.

A REPORT ON MEDICAL WORK IN THE APIA-FALEFA DISTRICT.

[BY REGINA FLOOD KEYES, M.D.]

DISTRICT.

THE district lies along the north coast of Upolu, extending from the eastern limit of Apia to Falefa, approximately twenty miles east of Apia. It is a succession of promontories, deeply indented bays and steep mountains, with only a narrow strip of comparatively level land just above high-water mark. Most of the Native villages lie along the shore on the narrow tidal plains surrounding the indentations of the sea. Manunu, Falevao, Lalomauga, Sauniatu, Faatoia, and Magiagi are the only inland villages in the district.

The Methodist Mission has a high school and a training college at Piula in charge of a European missionary and his wife. At Sauniatu is a Native Mormon settlement and school in charge of European missionaries. Simple home remedies and advice are dispensed to the Samoans by the European missionaries.

Three European plantations, at Vailele, Fagalii, and Vaivase, employing Melanesian and Chinese labour for many years, introduced miscegenation in the immediate vicinity of the plantation. Solaua rubber plantation, near the eastern end of the district, was opened up during the year with Chinese labour. The plantation is somewhat isolated; the coolies are recent arrivals in Samoa and have not yet established contact with the Samoan race. European managers at the plantation keep supplies of simple medicines on hand for the labourers.

Trading-stations are at Luatuanuu, Solosolo, Saluafata, Lufilufi, Faleapuna, and Falefa. Supplies of castor-oil and magnesium sulphate are stocked by the traders for the Native trade.

The district consists of twenty-four Native villages, the four European plantations, and the two missionary establishments. The Native population, according to the census of the 1st January, 1926, was 4,482.

TRANSPORTATION.

With the exception of the Solaua rubber plantation, Falevao, Manunu, Sauniatu, and Lalomauga, the villages and plantations are accessible by water and by the beach road. In order to open up the district for regular visits, the Administration in 1925 converted the foot-trail winding along the coast from Apia to Falefa into a fair motor-road in good weather. Detours were built around treacherous fords, concrete fords put in where needed, swampy stretches ballasted with rock. During the wet season, lasting from November to March, the road sometimes is impassable. Stormy seas wash out the bed, land-slides occur, trees fall across the way. The reconstruction of the bridge at Solosolo cut off the district from Solosolo to Falefa two months of the year 1926. Fortunately the road has been passable during the epidemics of infectious diseases, and it was possible for the doctor in charge to reach each village promptly with medical supplies and attention.

History.

Late in 1924 the Chief Medical Officer approached the author and suggested that she take over the district as an experiment and see what could be done by visiting the section regularly. It was desired that special efforts be made to reduce the infant mortality by systematic child-welfare work. No fixed plan was adopted at the beginning, and the present scheme was worked out more or less empirically.

Lufilufi Dispensary.

Through the kindness of the Methodist Mission, a building for a dispensary has been made available at Lufilufi. Drugs are supplied by the Government Hospital and dispensed free of expense to the Native patients. The dispensary is in charge of a trained Samoan nurse. She is a graduate of a hospital training-school, is sympathetic, industrious, and capable. Her service in the remote end of the district has relieved the Medical Officer of a large amount of detail work, leaving time free for child-welfare work.

Organization.

The policy from the beginning has been to instruct the Native in health subjects and hygiene, although incidentally the experiment has brought medical service to his *fale*. It was felt that as much responsibility as possible should be thrown upon the Samoan to hold his interest and gain his co-operation. Furthermore, it was believed that constant instruction repeated week after week over an extended period of time would leave some impression in the village, and perhaps some of the leading village women in time would be able to intelligently treat minor illnesses and complaints. Accordingly committees of women were set up in each village. The selection of the members was left entirely to the village women. Invariably the committees have been composed of the leading women of the village. Often the wife of the village pastor has been elected president of the committee.

Simple rules have been evolved for the committee, and they are carried out reasonably well. The most important rules are as follows:—

(1) Meetings must be held once a week and different women appointed to do certain tasks falling upon the committee.
(2) The president presides, and is responsible to the Medical Officer for the manner in which the work is carried out.
(3) A bell must be rung morning and night. The morning call is for attention to minor complaints such as colds, coughs, sores, small cuts, and to the cleanliness of the children. The night bell at 8 is the curfew for all children under twelve years.
(4) All houses, kitchens, and latrines must be inspected once a week. Persons in charge of dirty places are reported by the committee to the Pulenuu, the Native official in charge of the village.
(5) All cases of illness are to be reported to the Pulenuu (Native official), and if serious they must be brought to the attention of the Medical Officer of the district.
(6) Aid must be given to all ill persons or others needing attention.
(7) During epidemics the women's committees distribute medicines from house to house, maintain quarantines, and assist the Medical Officer and nurses.

A few simple remedies are left with the women's committee with instructions as to the proper use of the medicines. The medicines used in the Falefa district are—(1) Hydrogen peroxide and dropper, for otitis media; (2) oil of eucalyptus, to mix with native coconut-oil for a liniment; (3) castor-oil, for intestinal disturbances; (4) tincture of iodine, for ringworm, sores, and cuts; (5) Argyrol (5 per cent. solution) with dropper, for eyes; (6) cod-liver oil, for marasmic children.

The work of the women's committees has been excellent, and progress has been as rapid as could be expected. The attention given to the women's committees by the Administrator and by the Chief Medical Officer when on inspection trips has impressed the Native with the importance of the work done by the committees.

Inspections.

The Medical Officer meets each Village Committee every two weeks. The district is divided into two sections—Apia to Solosolo, and Solosolo to Falefa. One week is allotted to the Apia-Solosolo section, the next week to the second section. The schedule of meetings is as follows:—First week: Monday—Vaiala, Matautu, Matautu-uta, Faatoia; Tuesday—Letogo, Vailele, Vailele Plantation; Wednesday—Laulii, Luatuanuu, Solosolo; Thursday—Fagalii; Friday—Moataa, Matafagatele; Saturday—Magiagi. Second week: Monday Lecture at Papauta Girls' School; Tuesday—Surprise inspections; Wednesday—Saluafata, Lufilufi, Faleapuna, Salelesi-Fusi-Eva, Falefa; Thursday—inspections; Saturday—lecture at Methodist Training-college, Piula.

Procedure at Native Meetings.

A large Samoan house is made ready for the meeting by placing a table and a chair in one end for the visiting Medical Officer. The village Pulenuu (Government official), members of the women's committee, and all children under two years of age with their mothers are ordered to be present.

First a short talk on appropriate subjects is given to the assembled Samoans. The feeding of infants, general care of children, sanitation of the village, flies, mosquitoes, latrines, drinking-water, tuberculosis, dysentery, frambœsia, and hookworm have been subjects that were used. If any disease is in the village, or an infectious disease is approaching, special lessons are given to the village.

Then the women's committee is called upon to report to the Medical Officer. The members come forward in front of the table and describe conditions in the village. They report all cases of illness. Children and adults capable of walking to the Native hut are brought in for medical attention. Those too ill to be moved are visited by the Medical Officer after the meeting.

The babies are next weighed on the portable scales carried by the Medical Officer, and the weights entered in the records. The records show the name, weight, age, and sex of every child under two years. At each weighing the child's weight is publicly announced, and if there is any gain the mother is praised. If any loss is recorded an investigation is made at once for the cause. The mother, if at fault, is admonished, and special note is made on the record to check the weights very carefully the next visits.

After the weighing, medical attention is given to those requiring it. Common medicines are dispensed from the motor-car, prescriptions are written for drugs not on hand, patients requiring hospital treatment are sent to the Government Hospital at Apia.

Finally, the work of the Pulenuu and the women's committee is reviewed. An effort is made to create a spirit of emulation in the village and between villages. Attention is called to villages especially diligent in sanitation and kindred matters. The Natives are praised or criticized according to their work.

The next call is but a repetition of the foregoing. Village after village and week after week the work continues, in an effort to supplant the Native faith in Samoan cures for driving out devils with a knowledge of the common diseases in this field and more enlightened methods of treatment.

EPIDEMICS.

Progress has been considerably hampered by epidemics and threatened outbreaks of infectious diseases. The Samoans live a community life. Many occupy the same house, sleeping side by side on the floor. They cook and eat together. Articles of clothing are freely exchanged and worn by many persons. The Natives are very fond of travelling, and journey from village to village, stopping at many places. Consequently when there is an infectious outbreak the disease spreads rapidly around the islands.

In 1925 an epidemic of whooping-cough broke out in the district and increased the death-rate. Many of the deaths were only indirectly due to the disease, and other immediate causes were credited with the increased mortality.

In the early part of the year 1926 there was an outbreak of dysentery on the Island of Savai'i and at places in Upolu. The quarantine restrictions placed on travel stopped the spread of the infection. Redoubled caution was exercised in the Apia-Falefa district, and fortunately the disease was not introduced into that section. While the danger was imminent daily inspections were made by the committees, and the officer met the village officials and committees more frequently than as arranged in the schedule.

In August, 1926, an influenza-like disease appeared simultaneously in Vaiala and Solosolo, two villages about nine miles apart. From these points it spread rapidly throughout the Samoan Islands. From one-third to one-half the people in a village would be down at the same time. The period of incubation was very short, sometimes only twelve hours. Fever lasted from three to four days. The disease was very mild, with no complications. The symptoms were those of influenza of the respiratory type with leucocytosis instead of leucopenia. At first it appeared from the highly contagious nature of the infection that famine would follow the disabling of the plantation workers and others responsible for the village food-supply. Happily the period of disability was short, and sufficient numbers remained well enough to gather food-supplies until the first contacts were recovered.

Relief measures were promptly taken. Three Native assistants were drafted for duty. The motor-car was stocked with medicines. The officer travelling from village to village left medical supplies with the Village Committee and Native officials. They were instructed in the care of the sick and nature of the disease. The mild nature of the infection was emphasized, and the complete recovery of the first patients was stressed to stop wild rumours tending to create a panic in the Native population.

While the Medical Officer was with the Native Committees, village officials, and high chiefs, the Native assistants proceeded from house to house making a rough estimate of the number of patients, and instructed the well members of the household to go to the central dispensary for medicines. At first an effort was made to distribute medicine to the patients, but as the number grew this was abandoned for the plan of temporary central dispensaries in each village. The visit of the Native assistant in the house was more to reassure the sick and prevent panics. The few seconds' visit of a representative of the Medical Department, and the words "Send to the Pulenuu's house for medicine, plenty is available," was of great importance psychologically if not of much value clinically.

In the midst of the influenza epidemic thirteen cases of measles were discovered in the village of Laulii, about five miles from Apia. The infection was traced to a passenger arriving from American Samoa. Immediately a conference of high chiefs and women's committee was called in Laulii. Quarantine measures were explained. The co-operation of the village was promised when the situation was understood. All measles patients and contacts were isolated in two big Native houses. All travel through the village was stopped. The inhabitants of the village were restricted to the village and their plantations. The village officials and women's committee faithfully carried out the orders of the Medical Officer. Complete success was the result of the quarantine measures. Not a case of measles followed the Laulii infection. Other cases occurred in Savai'i, but these also could be traced to passengers arriving from Honolulu and American Samoa. The Government did not establish the measles quarantine at Laulii. It was adopted by the Natives themselves, and the rigid enforcement was left entirely to them. Such incidents as the foregoing lead one to believe that progress is being made and that all the efforts to teach the Samoans sanitation are not wasted.

In February of 1927 eleven cases of bacillary dysentery were found in the populous village of Vaiala, next to Apia. Three deaths occurred. Again a Native village submitted to a voluntary quarantine. Children were stopped from school. Strangers were refused admittance to the village. Contact with Apia could not be completely shut off, for many of the residents of Vaiala are employed in Apia in the shops and along the waterfront. However, contact was reduced to the minimum. The Village Committee made frequent inspections and reported new cases for immediate transportation to the isolation wards of the Apia Hospital. Thirty days have now elapsed since the last case was taken to the hospital. The outbreak was quelled in Vaiala. No cases were reported from any of the neighbouring villages. It appears that the disease was restricted to the infected village.

Hookworm Treatment.

Hookworm treatment was administered to the entire population of the district in 1925, and again in 1926. It is believed that very few inhabitants of the district missed the treatment.

Yaws.

When work first began numbers of cases of yaws were observed. Three injections of Novarsenobillon were given to all cases in the district. Since that round the number of cases in the district has been so small that no campaign has been necessary. Individual cases have been sent to the Apia Hospital for treatment. Each case has been followed up to see if the Pulenuu and the parent have carried out the Medical Officer's instructions.

Lectures.

Twice a month lectures are given to the Papauta Girls' School of the London Missionary Society and the Piula Training College of the Methodist Mission. The subjects follow those used in the meetings with the women's committees. Very elementary lessons in hygiene and physiology are given. As the majority of the students go back to the villages as pastors and wives of pastors and have positions of importance in the communal life it is believed that the seed sown in the school will eventually bear fruit.

Vital Statistics.

During 1926 there were 254 live births in the Apia-Falefa district, and the birth-rate per thousand mean population was 55·55, as compared with 52·6 for the whole of Western Samoa.

Deaths in the district numbered seventy-four, of which twenty-three were of infants under one year of age. The death-rate was 16·19 per thousand mean population, as compared with 19·36 for the whole Territory, and the infant mortality rate 90·5, as compared with 105·9 for 1926. The mean population of the district was 4,572.

Child Welfare.

Infant mortality in Western Samoa has been high. Prior to 1924 it was estimated at 200 deaths per thousand live births. In 1924 it was 155. A whooping-cough epidemic in 1925 pushed it up to 186 per thousand, and statistics for 1926 show that it was 106 per thousand live births.

The following table shows deaths of infants under one year of age per thousand live births in certain countries :—

Country.	Year.	Rate.	Country.	Year.	Rate.
New Zealand	1921–25	43	Western Samoa	1926	106
Australia	1921–25	58	Belgium	1919–23	107
Irish Free State	1920–24	72	Germany	1920–24	127
Norway	1918–22	58	Western Samoa	1924–26	149
Switzerland	1919–23	74	Austria	1919–23	150
England and Wales ..	1921–25	76	Spain	1919–23	151
United States of America ..	1919–23*	81	Japan	1920–24	163
France	1921–25	94	Ceylon	1920–24	192

* Registration area.

As an infant-mortality rate above 50 per thousand is preventable by sanitation, hygiene, and the instruction of mothers, it is evident that there is scope for child-welfare work in Western Samoa. It was primarily for this work the Apia-Falefa district was assigned to the author.

Work began in Vaiala. The mothers were keenly interested in the work. No difficulty was encountered in getting 100 per cent. attendance of children under two years. There is an element of competition—weighing one baby against another—that appeals to the Samoan mother. Proper scales were obtained, and as roads were opened up in the district the work was gradually extended to all coast villages. The same keen interest in child-welfare work was found to exist throughout the district. After a few weighings traders in outlying villages reported mothers were taking their children to the store scales to check up on their babies' weights. During the two years approximately 885 babies were weighed regularly: 274 of 301 births in the district were brought to the clinics, and weights were recorded from the first week. Some have been carried through the two-years period and discharged from the clinic. Other are still in the books, and weighing will continue until the children reach two years of age.

When the work began children of all ages were brought to the weighings. Definite age information was very difficult to obtain. As explained by the interpreter, "The mother tells you the first figure

she thinks of." The best that could be done was to ask the month of the baby's birth and then calculate its age. Even this information was not too reliable, and was checked by the weight.

Average Weights.

After more than two years' work in the district there are on record from 275 to 357 weighings in each age class. In compiling the statistics babies brought to the clinic at birth or immediately thereafter were separated from those brought later in life. Definite age information was available in the case of a new-born infant, and by tracing the baby's record it was possible to obtain weights at definite and trustworthy ages. 274 babies were weighed at birth or during the first week; 109 of these were carried through to the end of the second year. Since the work began the number of weighings in each age class ranges from 109 to 274. While larger numbers are more desirable for arriving at averages, it was thought that an average based upon the known weights and ages might serve to check statistics of children of all ages brought to the clinics.

In Tables A and B appended to this report are found the records of the babies brought to the clinics at birth or during the first week, and the weights of all other infants whose ages were more or less uncertain. Each of the tables was used to work out the average weights at certain ages. Table B checked with A proved to be reasonably accurate and reliable for statistical purposes. Combining the two tables there were available from 274 to 357 babies in each age class for arriving at the average weight. Summaries of the two tables, separate and combined, follow:—

SUMMARY.

Table A.—Babies weighed since Child-welfare Work began in Western Samoa.

Age.	Number weighed.	Total Weights.	Average Weight.
		lb. oz.	lb. oz.
One week	274	2,100 0	7 10·6
One month..	274	2,506 2	9 2·4
Two months	270	2,959 10	10 15·3
Three months	252	3,347 5	13 4·5
Six months..	210	3,612 6	17 3·2
Nine months	176	3,305 4	18 12·4
Twelve months	143	2,799 10	19 9·0
Eighteen months	114	2,393 14	20 15·9
Twenty-four months	109	2,508 7	23 0·2

Table B.—Babies brought to Clinic at Age of Three Months or More.

Age.	Number weighed.	Total Weights.	Average Weight.
		lb. oz.	lb. oz.
Three months	85	1,149 2	13 8·3
Six months	149	2,541 12	17 0·9
Nine months	166	3,151 11	18 5·8
Twelve months	242	4,763 2	19 10·9
Eighteen months	204	4,324 10	21 3·1
Twenty-four months	248	5,861 15	23 10·2

Tables A and B combined.

Age.	Number weighed.	Total Weights.	Average Weight.
		lb. oz.	lb. oz.
One week	274	2,100 0	7 10·6
One month..	274	2,506 2	9 2·4
Two months	270	2,959 10	10 15·3
Three months	337	4,496 7	13 5·5
Six months..	359	6,154 2	17 2·2
Nine months	342	6,456 15	18 14·0
Twelve months	385	7,562 12	19 10·3
Eighteen months	318	6,718 8	21 2·0
Twenty-four months	357	8,370 6	23 7·1

A comparison of average weights in Western Samoa with those in the United States and New Zealand, the only countries for which statistics are at hand, show certain interesting differences. Babies of Western Samoa are slightly heavier at birth, and continue so during the first six months. At nine months of age the European babies have caught up with the Samoan babies. At twelve months the Samoan baby is from 1 lb. to 3 lb. under weight, and at two years it is 3 lb. to 4 lb. under the average in the United States.

The following table compares averages in Western Samoa with averages in New Zealand and the United States :—

Age.	New Zealand Average.	United States Average.	Western Samoa Average.
	lb. oz.	lb. oz. lb. oz.	lb. oz.
One week	7 0	6 8 to 7 8	7 10·6
One month	8 12	7 13 to 8 13	9 2·4
Two months	10 8	8 9 to 10 9	10 15·3
Three months	12 8	12 0	13 5·5
Six months	16 0	16 0	17 2·2
Nine months	18 0	17 8 to 20 0	18 14·0
Twelve months	20 0	20 8 to 22 0	19 10·3
Eighteen months	..	..	21 2·0
Twenty-four months	..	26 8 to 27 8	23 7·1

Averages for New Zealand are taken from charts in Sir F. Truby King's "Feeding and Care of Baby." Averages in Western Samoa were compiled from 274 to 357 cases in the Apia-Falefa district. The figures for the United States are composite of figures compiled by Holt from several hundred hospital and private cases in New York, several thousand cases compiled from twenty-three States by the American Medical Association, the Life Extension Institute, and Better Babies Bureau of the Woman's Home Companion.

Improper Feeding.

At the age of six months the Samoan mother begins to wean her baby. Cow's milk is not available in Western Samoa; dried milks and patent baby-foods for the average mother are unobtainable; so the mother turns to native foods as substitutes. Boiled green bananas, baked taro, and ripe bananas are masticated by the mother, then fed to the baby. The marked change in the diet is forced upon the child before its digestive organs are used to the new way of feeding. Without proper substitutes for the mother's milk weaning-time is especially perilous in Western Samoa. The evils of improper feeding at this period of the baby's life are reflected in the vital statistics and in the average weights of the babies as worked out in the clinics. Malnutrition during this period has caused Samoan babies to average from 1 lb. to 4 lb. under weight as compared with European babies, whereas during the first six months the records show that they are from ½ lb. to 1 lb. over weight. By far the largest number of infants die at this period.

In 1924 and 1925 the percentages of deaths at ages under two years were as follows :—

Age.	1924.		1925.		1926.	
	Number.	Per Cent. of Total Deaths.	Number.	Per Cent. of Total Deaths.	Number.	Per Cent. of Total Deaths.
Under 1 week	34	4·44	50	5·63	31	4·29
From 1 week to 1 month ..	25	3·26	36	4·20	22	3·04
From 1 month to 3 months ..	28	3·66	51	5·95	14	1·92
From 3 months to 6 months ..	44	5·74	100	11·67	37	5·12
From 6 months to 12 months ..	164	21·41	142	16·57	104	14·39
From 1 year to 2 years	99	12·93	97	11·32	93	12·86
	394	51·44	476	55·34	301	41·63

Red Cross Supplies.

During the year 1926 a shipment of dried milk for child-welfare work was received from the New Zealand Red Cross. Four cases were allotted to the Apia-Falefa district, and the worst cases of malnutrition were placed on the prepared food after all efforts to find other supplies of food failed. In at least a dozen cases it is believed that the prepared food has saved the babies so far. These babies are now gaining weight. Probably all would have died if food had not been given by the New Zealand Red Cross.

In order to do the utmost good the prepared food is issued only to the most deserving cases under strict supervision. An adequate supply should be on hand to carry the infant through until such time as it can live on other foods. There is little object in saving a baby's life for two or three months and then withdrawing its Red Cross food before it can live on the native foods.

Native Foods.

One of the greatest problems is the finding of proper native foods for the infant. The Samoans in the past have not owned milch-cows. Among the substitutes for milk during weaning, baked and boiled papaya, soft jelly-like meat of young coconuts, arrowroot with coconut-cream, rice-water, and boiled rice with coconut-cream are recommended. Later on eggs, fish, and scraped taro and yams, well baked or boiled, are used.

CONCLUSIONS.

Summing up the results of more than two years' work in the district:—

(1) Sanitation and public health have been improved. Yaws, ringworm, scabies, and conjunctivitis have almost disappeared. Hookworm treatment is given annually.
(2) More confidence in the medical treatment has been established, and patients go to the Apia Hospital more readily.
(3) Women have been given a greater share in village affairs, and with added responsibility they have shown greater interest in health matters.
(4) Progress has been made in educational work. Two voluntary quarantines established by Samoans mark an advance.
(5) Samoan infants have been shown to be under weight after the first six months, due to improper feeding. Infant mortality during this period is high, but can be reduced by proper feeding.
(6) Regular weighings have tended not only to keep up interest but also have made the mothers more careful.
(7) It is believed that both the mortality rate and the infant-mortality rate in the district were reduced by medical attention being carried to the village.
(8) Medical articles prepared for the *Savali* (Native *Gazette*) have proven of great assistance to the Medical Officer in dealing with the committee, and are believed to have improved sanitation through Western Samoa.
(9) The support of His Excellency the Administrator and the assistance of the Chief Medical Officer have contributed greatly to the success of the experiment. Indifference on their part would have meant failure or indifferent results in the district.
(10) The results of regular work in the district justify its continuance.

APPENDIX C.

A CASE OF DIFFICULT LABOUR DUE TO A GROWTH IN CERVICAL CANAL.

By E. HUNT, M.R.C.S., L.R.C.P.

T—— (female—*Vaimoso*; 6 para.).—Patient was admitted at 6.30 a.m., having been in labour for twenty-four hours. Membranes ruptured night before admission. (Date of admission, 22nd September, 1926.)

Abdominal palpation—R.S.A. Per vaginam a pedunculated mass, 3 in. by 3 in., is felt projecting from right antero-lateral lip of os. Os three-quarter dilation. Breech felt through os. Portion of os occupied by tumour feels harder than normal. Under general anæsthesia, first left then right foot brought down, delivery being easy until arms became extended above head, the left arm lying behind left ear; arms brought down with difficulty, the head being tightly clapsed by os, which felt very rigid and inelastic.

After delivery the mass above mentioned was drawn outside vulva and inspected. It consisted of a thin mass of tissue with a raw irregular surface connected to the os by a pedicle. The placenta was expressed twenty minutes later, with little hæmorrhage. Puerperium normal.

On the 6th October, owing to doubt as to exact nature of tumour, it was examined under a general anæsthetic with a view to removal. It was found that the pedicle had contracted, leaving the mass projecting from the posterior lip of the os. This was removed and the edges sutured together with silk. The sutures were removed on the thirteenth day. The patient left hospital quite well on the 19th October, 1926.

Microscopically the tumour had some resemblance to a carcinoma, but it was not definitely carcinomatous.

APPENDIX D.

A CASE OF BRONCHIAL SPIROCHÆTOSIS.

By W. C. MACKNIGHT, M.B., F.R.C.S. (Edin.).

J—— (male, aged twenty-five years; a Tokelau Native, a teacher at Malua.)—Admitted to hospital on 10th September, 1926.

History: Previous history good. Three weeks before admission had influenza, which was epidemic at the time. Ever since has had cough, pain in chest, and headache.

On admission: A well-developed man in good condition. Temperature 104°; pulse 84; respiration 24. The right lung was normal. Left lung—apex clear, base dullness, tubular breathing, a few crepitations, increased vocal resonance. Other organs normal.

Two days later his temperature was normal, but rose again, and on the 19th was 104°; pulse 120; respiration 30. There was consolidation of the left lung, through which the heart-sounds were conducted, and could be heard very distinctly at the back.

On the 22nd resolution began in left lung, but temperature, pulse, and respiration remained up. An examination of the blood gave a Widal negative.

On the 24th the left lung was clear but the right apex was consolidated. This condition rapidly spread to the whole lung. Temperature remained about 102° day and night; respiration about 30, and pulse about 100. Tubular breathing and rales again appeared in the left lung.

The patient rapidly became worse; his feet became œdematous, and other signs of cardiac failure appeared. The temperature rose to 103·5°, pulse to 120, and respiration to 40. There were no signs of any nodules on skin or areas of suppuration. An examination of the sputum showed

every field packed with what the pathologist reported as a streptothrix. Examination of urine showed—reaction acid; specific gravity 1,010; albumen strong, positive; sugar nil; eposit pus cells and various types of epithelial cells, a few casts. The patient died on 7th October.

Treatment at first was by rectal injections of potassium permanganate, gr. ½ in 1 pint water every three hours. This treatment was continued for a week, but, as no improvement took place, potass. iodid. in 15-grain doses was given three times daily, and other symptoms treated as they arose. Neither the potass. permanganate nor the potass. iodid. produced any good result.

Pathological Report on Sputum.—Ziehl Neelsen stain: No tubercle bacilli found. Gram's stain: A few streptococci and staphylococci. Abundant gram-positive slender filamentous forms present throughout films, and in parts massed together. These forms, which are not acid-fast, show apparent branching. Ærobic cultures failed to grow. Facilities for suitable anærobic cultures were not available. It is a streptothrix infection.

APPENDIX E.

A CASE OF CHYLURIA IN A SAMOAN.

(Reported by Dr. A. F. MACKAY.)

S——, a Samoan male, age thirty-five years, was admitted to Aleipata Hospital, Samoa, on the 6th January, 1927, suffering from a small elephantoid scrotum, complicated by an apparent double inguinal hernia of ten years' duration.

On examination: The scrotum was about the size of a small coconut. The skin was flabby and definitely elephantoid over the anterior aspect. On the sides of the scrotum were a few small vesicles, which on being punctured exuded a drop or two of milky fluid. The testicles were enlarged to the size of a small hen's egg and considerably indurated. The presence of a hydrocele sac was very doubtful. On the left side a large inguinal hernia extended to the bottom of the scrotum on coughing and was easily reducible. On the right side there was a tumour at the external inguinal ring the size of a bantam's egg. It was easily reducible, but reappeared with a distinct impulse on coughing. It was diagnosed as another inguinal hernia.

10th January: Operation. Radical cure of the left inguinal hernia was performed under Novocaine-adrenalin ½ per cent. The sac was separated from the cord in the usual way. Round the neck of the sac was what appeared to be a small amount of fatty tissue, but on separating it from the sac milky fluid began to spurt from what was really a collection of Chylous vessels. These were ligatured and excised, together with the sac. More Chylous vessels were injured on inserting sutures through Poupart's ligament, and had to be ligatured.

Inquiry now elicited the fact that the patient had suffered from chyluria for seven years. Inflammatory *mumu* attacks commenced in the scrotum and testicles about the same time, resulting in the elephantiasis of the scrotum and the induration of the testicles. He had never felt the slightest ill effects from the chyluria, and had always enjoyed good health. Some days his urine would be practically clear, and other days, especially after hard work, it would be very milky and perhaps tinged with blood.

The evening after the operation the patient began to experience considerable pain over the region of the bladder. As he was unable to pass urine, a rubber catheter was passed and 18 oz. of milky blood-stained urine was drawn off, not without difficulty, owing to the blocking of the catheter with blood-clot and epithelial debris.

12th January: Patient passed urine naturally.

16th January: Patient again unable to pass urine. Rubber catheter could not be passed, but a silver one was passed with ease. Only after considerable straining on the part of the patient, however, could 11 oz. of urine be obtained. It had the consistency of thick clotted milk, and was mixed with blood and epithelial debris. Half an hour later a rigor occurred, the temperature reaching 104°. The rigor lasted twenty minutes, and at the end of this time the patient passed naturally a considerable amount more Chylous clot, and had no more trouble.

17th January: Urine passed naturally, almost free from Chyle.

4th February: Operation for right inguinal hernia (Novocaine-adren. ½ per cent.). On incising the aponeurosis of the external oblique muscle the cord and what appeared to be the sac of the hernia and its contents bulged forward. This apparent sac was easily separated from the cord, and was then found to be a mass of tortuous Chylous vessels which spurted Chyle freely when injured. These vessels could be emptied by pressure, but immediately refilled from the abdomen. No true hernial sac could be found. The spurting points were ligatured and the inguinal canal repaired after pushing the mass upwards out of the way.

No difficulty was experienced in passing urine after this operation, or after the next, when the scrotum was amputated on 11th February.

Convalescence was uneventful; some days the urine would be Chylous and other days only slightly turbid. No microfilariæ could be found in the blood.

This case is reported on account of the rarity of this filarial condition in the Pacific, and on account of the mass of Chylous vessels present in the right inguinal canal, simulating a hernia.

Approximate cost of Paper.—Preparation, not given; printing (1,250 copies, including maps), £52 10s.

By Authority: W. A. G. SKINNER, Government Printer, Wellington.—1927.

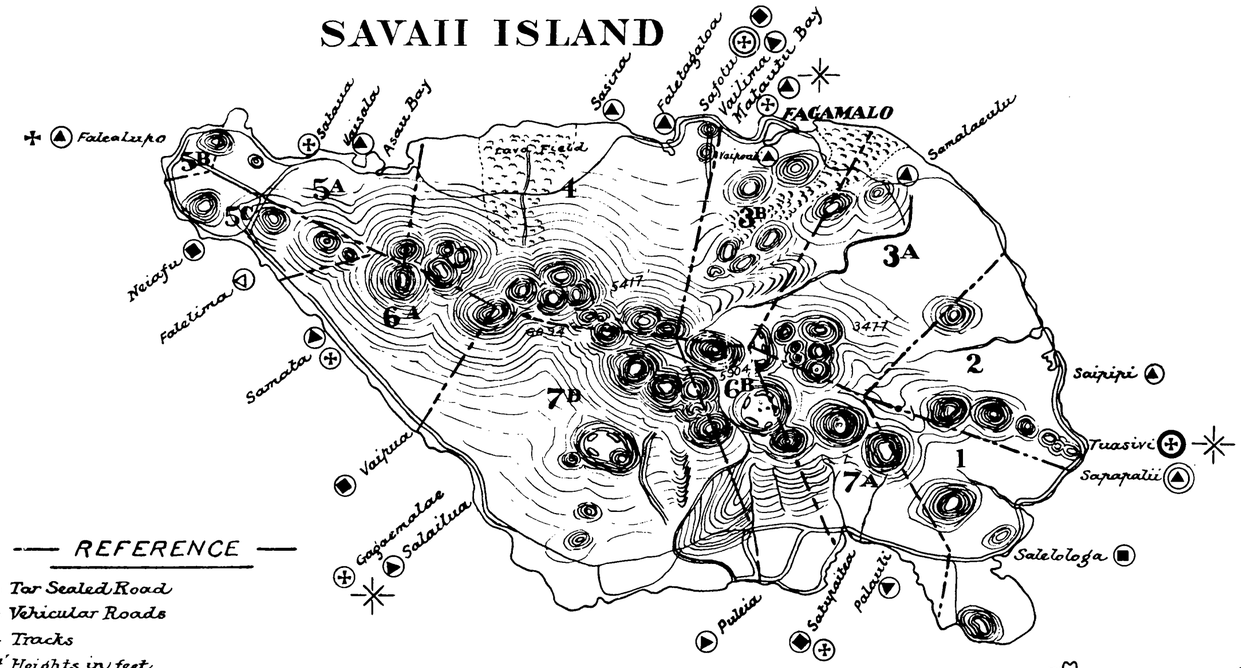
Price 1s.]

WESTERN SAMOA

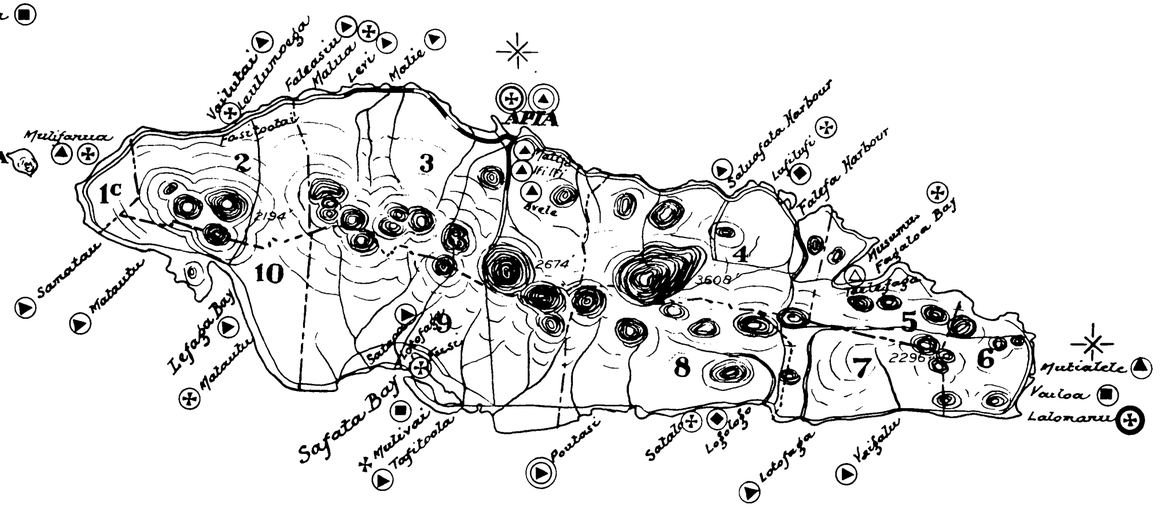
Scale
0 2 4 6 8 10 MILES

True North

SAVAII ISLAND



UPOLU ISLAND



REFERENCE

- Tar Sealed Road
- Vehicular Roads
- Tracks
- 6094' Heights in feet
- Main Hospital — 4 Medical Officers, 8 European Nurses, Dispenser, Pathologist, Samoan Nurses & Cadets etc.
- District Hospitals — 1 Medical Officer, 2 Samoan Nurses, 1 Interpreter
- Native Medical Practitioner — Native Nurse & Dispensary
- Mission Station Dispensary — 1 Samoan Nurse
- Mission Station Dispensary
- Dispenser with small Hospital
- Government Schools, European Teachers
- Government Schools, Native Teachers
- Government Training School

2ND GRADE NATIVE SCHOOLS

- London Missionary Society
- Methodist
- Mormon

- L.M.S. Training Schools

AGRICULTURAL DISTS.

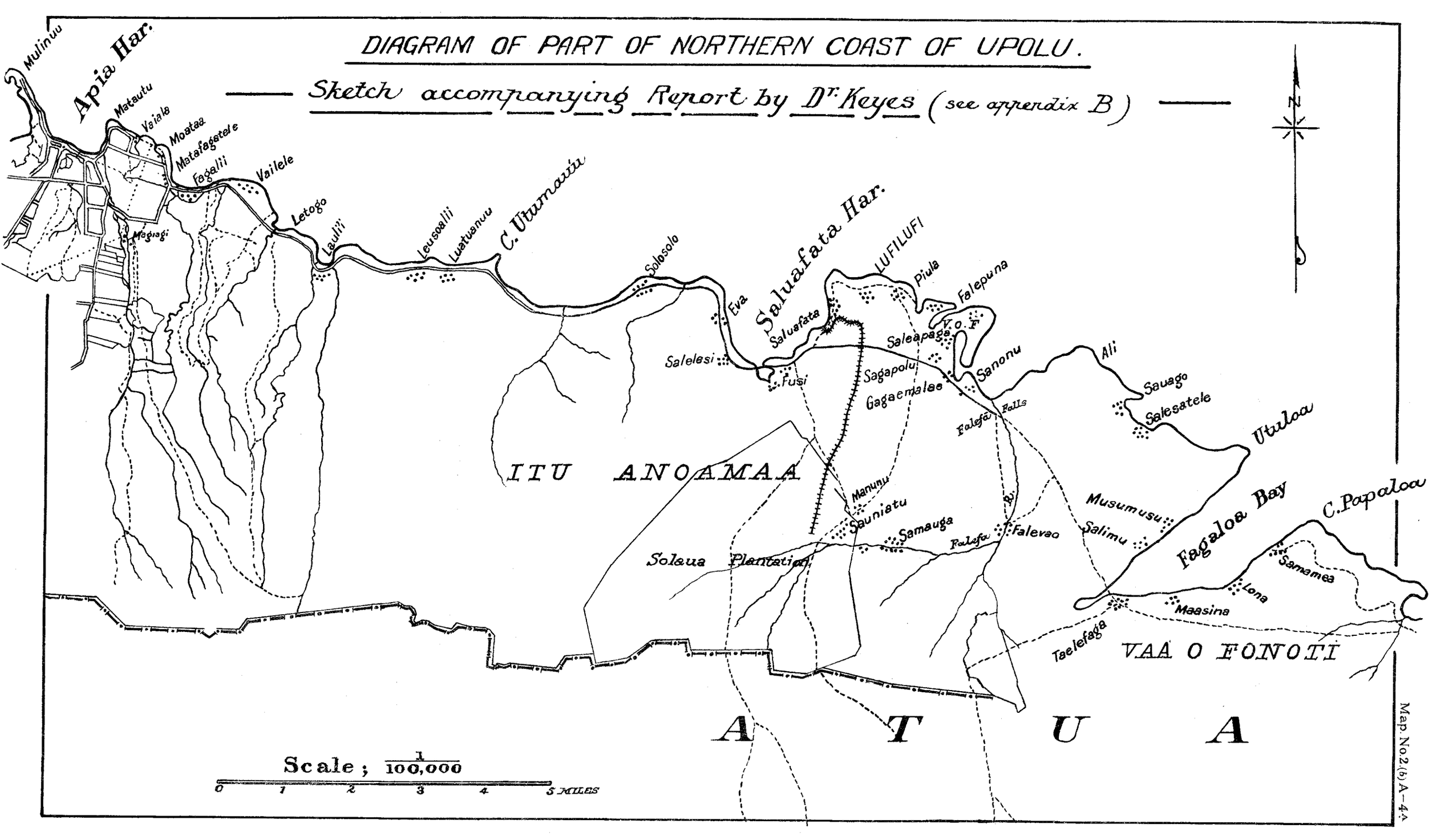
UPOLU	SAVAII
1 Aiga i le tai	1 Faasaleleaga South
A Manono	2 " North
B Apolima	3A Lealatele
C Mulifanua	3B Saleaula
2 Aana North	4 Gagaifomauga
3 Tuamasaga North	5A Vaisigano
4 Itu Aeoamaa	5B Falealupo
5 Vaa o Fonoti	5C Alataua
6 Aleipata	6A Saleaga
7 Lepa ma Lotofaga	6B Satupaitea
8 Falealili	7A Palauli East
9 Tuamasaga South	7B " West
10 Aana South	

- Wireless Stations

LANDS & SURVEY DEPARTMENT
APIA, WESTERN SAMOA, 1927.

DIAGRAM OF PART OF NORTHERN COAST OF UPOLU.

— Sketch accompanying Report by Dr. Keyes (see appendix B) —



Map No. 2 (b) A—44

Scale: 1:100,000
Labrador Bay
Cape Harrison
Cape Chidley
Port Burwell
Nachvak Fiord
Saglek Bay
Okak Bay
Hebron
Nain
Hopedale
Davis Inlet
Cape Mugford
Cape Harrison
Port Manvers Run
Hamilton Inlet
Groswater Bay
Cape Porcupine
Cape Bauld
Belle Isle
Strait of Belle Isle
Labrador Sea
Atlantic Ocean
Gulf of St. Lawrence
Anticosti Island
Prince Edward Island
Nova Scotia
New Brunswick
Quebec
Ontario
Maine
Vermont
New York
Pennsylvania
Ohio
Michigan
Wisconsin
Minnesota
Illinois
Indiana
Kentucky
West Virginia
Virginia
North Carolina
South Carolina
Georgia
Florida
Alabama
Mississippi
Louisiana
Texas
Arkansas
Tennessee
Missouri
Iowa
Kansas
Nebraska
South Dakota
North Dakota
Montana
Wyoming
Colorado
New Mexico
Arizona
Utah
Nevada
California
Oregon
Washington
Idaho
Alaska
Hudson Bay
James Bay
Ungava Bay
Baffin Island
Southampton Island
Melville Peninsula
Foxe Basin
Foxe Channel
Gulf of Boothia
Prince of Wales Island
Somerset Island
Victoria Island
Banks Island
Queen Elizabeth Islands
Ellesmere Island
Axel Heiberg Island
Devon Island
Cornwallis Island
Bathurst Island
Melville Island
Prince Patrick Island
Eglinton Island
Amund Ringnes Island
Ellef Ringnes Island
Meighen Island
Borden Island
Lougheed Island
Cape Columbia
Cape Thomas Hubbard
Cape Alexander
Cape Sabine
Cape Isachsen
Cape Richardson
Cape Colgate
Cape Providence
Cape Parry
Cape Lyon
Cape Dalhousie
Cape Kellett
Cape Prince of Wales
Cape Barrow
Cape Lisburne
Point Hope
Point Barrow
Point Franklin
Point Lay
Wainwright
Barrow
Atqasuk
Meade River
Umiat
Anaktuvuk Pass
Arctic Village
Kaktovik
Fort Yukon
Old Crow
Inuvik
Tuktoyaktuk
Aklavik
Arctic Red River
Fort McPherson
Norman Wells
Fort Good Hope
Colville Lake
Fort Simpson
Fort Liard
Fort Nelson
Fort St. John
Dawson Creek
Prince George
Prince Rupert
Vancouver
Victoria
Seattle
Portland
San Francisco
Los Angeles
San Diego
Las Vegas
Salt Lake City
Denver
Albuquerque
Phoenix
Tucson
El Paso
Houston
Dallas
Austin
San Antonio
Corpus Christi
Brownsville
Laredo
Monterrey
Mexico City
Gulf of Mexico
Gulf of California
Gulf of Alaska
Bering Sea
Bering Strait
Chukchi Sea
Beaufort Sea
Arctic Ocean
Pacific Ocean
Aleutian Islands
Kodiak Island
Alaska Peninsula
Cook Inlet
Anchorage
Fairbanks
Juneau
Sitka
Ketchikan
Wrangell
Skagway
Whitehorse
Yukon Territory
Northwest Territories
Alberta
Saskatchewan
Manitoba
Ontario
Quebec
Newfoundland
Labrador
Nunavut
Greenland
Iceland
Europe
Asia
Africa
South America
Australia
New Zealand
Antarctica
Hawaii
Honolulu
Midway Islands
Wake Island
Guam
Philippines
Japan
China
Russia
India
Pakistan
Afghanistan
Iran
Iraq
Saudi Arabia
Yemen
Oman
United Arab Emirates
Qatar
Bahrain
Kuwait
Turkey
Syria
Lebanon
Israel
Jordan
Egypt
Libya
Algeria
Tunisia
Morocco
Western Sahara
Mauritania
Senegal
Gambia
Guinea-Bissau
Guinea
Sierra Leone
Liberia
Ivory Coast
Ghana
Togo
Benin
Nigeria
Cameroon
Equatorial Guinea
Gabon
Republic of the Congo
Democratic Republic of the Congo
Angola
Namibia
Botswana
Zimbabwe
Mozambique
South Africa
Lesotho
Swaziland
Madagascar
Mauritius
Seychelles
Comoros
Djibouti
Somalia
Ethiopia
Eritrea
Sudan
South Sudan
Kenya
Uganda
Rwanda
Burundi
Tanzania
Malawi
Zambia
Mozambique
Zimbabwe
Botswana
Namibia
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