

1924.  
NEW ZEALAND.

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# MANDATED TERRITORY OF WESTERN SAMOA.

(SUPPLEMENTARY REPORT OF THE DEPARTMENT OF HEALTH, ADMINISTRATION OF WESTERN  
SAMOA, FOR THE YEAR ENDED 31st MARCH, 1924.)

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

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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, 1924. In previous years the medical report has been included in the annual report on the Territory, but, for reasons given below, it has been considered advisable to submit a separate, more detailed report.

Although the islands of the South Pacific are fortunate in that the most serious scourges of the tropics are not present, they all have serious problems to solve regarding disease and its prevention. To ensure satisfactory results it is necessary to have co-operation in the work carried out in the different groups. This co-operation is not easy of attainment where various Administrations of different nationalities control the scattered island groups, and where there is very little or no interchange of ideas. The publication and exchange of detailed medical reports will give us information as to what is being attempted and what is being accomplished outside our own boundaries, and will be an important factor in the development of co-operation.

## GENERAL SURVEY OF THE WORK FOR THE YEAR.

In 1923 the positions of Chief Medical Officer and of Medical Officer of Health were combined, and therefore the past year is the first one in which the activities of the two divisions of the Department of Health (Clinical and Public Health) have been controlled by one head.

The year under review is also the first one in which free medical treatment has been given to the Natives of the Territory. As the result of a request on the part of the Natives that a medical offering be paid each year by every adult male, instead of each individual paying his own medical expenses, a medical charge of £1 per adult male was levied, and free treatment instituted. This resulted in an immediate and large increase in the numbers seeking medical aid, and also in a more insistent demand for the establishment of district dispensaries. It also gave the Department the opportunity of organizing campaigns against such diseases as hook-worm and frambœsia, the systematic treatment of which was impossible where a charge was made for treatment.

The first and chief essential to the success of the medical service is that the confidence of the Natives must be gained and retained. The Samoans are a conservative race, and the gaining and retaining of their confidence is no easy task. That we are rapidly gaining it is shown by the readiness with which they enter the hospital for operations, and the increasing demand throughout the Territory for European methods of treating the sick.

## PUBLIC HEALTH.

The year was marred by an epidemic of dysentery, which investigation showed to be due to the B Dysenteriae (Shiga). This caused an increase in the number of deaths for the year of approximately four hundred. For a comparison of this year with other epidemic years, see the report on vital statistics.

|                                     | Europeans. | Samoans. | Chinese. | Solomon-Islanders. | Total. |
|-------------------------------------|------------|----------|----------|--------------------|--------|
| Pneumonia and lobar pneumonia .. .. | 2          | 25       | ..       | 2                  | 29     |
| Pulmonary phthisis .. ..            | 2          | 16       | 1        | ..                 | 19     |
| Pulmonary tuberculosis .. ..        | 1          | 3        | ..       | ..                 | 4      |
| Broncho-pneumonia .. ..             | 1          | 4        | ..       | ..                 | 5      |
| Enteric fever .. ..                 | ..         | 3        | 7        | ..                 | 10     |
| Typhoid fever .. ..                 | ..         | 8        | ..       | ..                 | 8      |
| Bacillary dysentery .. ..           | 70         | 124      | 12       | ..                 | 206    |
| Measles .. ..                       | 2          | ..       | ..       | ..                 | 2      |
| Beriberi .. ..                      | ..         | ..       | 12       | ..                 | 12     |
| Influenza .. ..                     | 19         | 9        | 3        | ..                 | 31     |
| Mumps .. ..                         | 4          | 4        | 2        | ..                 | 10     |
| Leprosy .. ..                       | ..         | 4        | 1        | ..                 | 5      |
| Tetanus .. ..                       | ..         | 1        | ..       | ..                 | 1      |
| Tertiary syphilis .. ..             | ..         | ..       | 2        | ..                 | 2      |
| Chicken-pox .. ..                   | 1          | ..       | ..       | ..                 | 1      |

*Antylostomiasis*.—A preliminary survey carried out in 1920 by Dr. O'Connor, of the London School of Tropical Medicine, showed that hookworm infection amongst the Samoans was almost universal. The institution of free treatment at the beginning of 1923 made it possible to commence a systematic campaign against this disease. The methods of the International Health Board (Rockefeller Foundation) had been studied both in Queensland and in Fiji, and, with lanterns, slides, and film obtained from the Board, a commencement was made to educate the Natives to a recognition of the necessity for sanitation. In each village an illustrated lecture was given at night, and early next morning every one who desired treatment was given a dose of carbon tetrachloride and magnesium sulphate. This continued until October, when, owing to doubt as to the purity of the drug, the work was temporarily abandoned. By the time new supplies arrived other factors made it impossible to recommence the work for some time. During the period April–October over eighteen thousand Natives were treated—most of them in Savai'i. Attention is now being given to the provision of latrines in the villages of the various districts, and as each district builds a sufficient number, systematic treatment will again be instituted. A photograph is given (Fig. 1) showing the "outfit" used for treatment.

*Framboesia*.—This disease is so common that practically no Samoan reaches adult life without having suffered from the infection. Usually the primary stage appears during the first few years of life. With the introduction of free treatment the demand for treatment was so great that, with the staff available, it was found impracticable to carry on both hookworm and yaws campaigns at the same time. The treatment of yaws is one of the best ways of driving home to the Native the value of our methods of treatment of the sick as compared with theirs, and it was therefore reluctantly decided that the campaign against hookworm would have to be postponed until treatment has been given to all those suffering from yaws in the Territory. During the year over 32,000 injections of novarsenobillon were given—each sufferer, as far as possible, being given three injections at intervals of a week. Approximately half these treatments were given at the Apia Hospital and the remainder in the outlying districts. With periodic inspections of the area and treatment of those found suffering from the disease, especially the young children with primary and secondary lesions, yaws should in a few years be well under control. One difficulty experienced in this campaign has been that the Natives are unwilling to produce for treatment those young children in whom the disease is still in the primary stage. According to popular belief, treatment at that time will only "drive the disease in" and so injure the child. But so satisfied are the Natives as to the value of our methods that they are willing to have stringent regulations passed for the control of the disease, and such regulations have now been prepared.

*Filariasis*.—The researches carried out here by Dr. O'Connor from 1920 to 1922 have been published ("Research Memoirs of the London School of Tropical Medicines," Vol. iv, 1923). A second expedition, under Dr. P. A. Buxton, arrived in January of this year to continue the work. The expedition expects to remain in Samoa for two years investigating this and other tropical conditions.

## CHILD WELFARE.

The statistics for the year show clearly that the majority of deaths in Western Samoa occur during the first few years of life. Of the 1,398 deaths, 719 were of children under two years of age, and the majority of these were between the ages of six months and eighteen months. The dysentery epidemic experienced during the year was responsible for a number of these, but apart from this there is a considerable wastage of child-life between the ages given, a wastage which is preventable,

but only gradually so. With the introduction of systematic treatment for yaws throughout the group one of the principal causes of debility in children under two years of age is being rapidly eliminated; but the chief factor—improper feeding when the child is being weaned—will disappear only with the education of the mothers. Such education is being undertaken.

Dental inspection of schools was commenced in February, 1924, and medical inspection will be commenced as soon as the necessary arrangements can be made.

#### QUARANTINE.

Of the eighty-six vessels arriving at Apia from overseas, two were quarantined on account of the presence of influenza on board. These are the only two occasions on which it has been found necessary to refuse pratique since January, 1921.

#### FOOD AND DRUGS.

During the year 6,658 lb. of meat was condemned as unfit for human consumption, as compared with 7,393 lb. during the previous year. But whereas during the previous year most of the meat condemned was canned meat, this year the amount of such condemned was much reduced. The following shows the proportion of this class of meat to the total amount condemned: canned meats, 1,850 lb.; meat in kegs, 4,630 lb.; cured and frozen meats, 178 lb.: total, 6,658 lb.

Rice to the amount of 18 tons 11 cwt. was condemned as unfit for human consumption.

#### SANITATION.

During the past three years the sanitation of Apia has been considerably improved. Until 1920 sanitation may be said to have been practically unknown. There were no men with a sufficient knowledge of plumbing and drain-laying, and the work carried out was in most cases crude and unsatisfactory. Sinks and bathrooms discharged their contents on the ground under the floor, or just outside the house. The average pit privy was most insanitary and unsightly. Some of the septic tanks installed prior to that date have worked satisfactorily, but many have required to be remodelled. With the introduction of civil administration a commencement was made to improve conditions; and regulations, consisting largely of detailed specifications of the standard of work required, were drafted. A Health Inspector with qualifications in plumbing and drain-laying was appointed. A careful survey was made of the condition of every building in Apia and the immediate vicinity. The various points noted in the survey were:—

- (1.) Address.
- (2.) Site.
- (3.) Nature of soil.
- (4.) Surroundings: Access of light and air; obstruction by trees or buildings; open space at front, sides, back (area); proximity (distance in feet) of stables, cow-sheds, pigsties, manure heap, foul ditches, stagnant water, offensive accumulations, offensive trades, or other sources of effluvia.
- (5.) Yards and outbuildings: Condition as to cleanliness, paving, drainage, area, closets, workshops, &c.
- (6.) Foundations: Damp-proof course; banking of soil against walls; ventilation of space beneath ground floor, and short description of foundations.
- (7.) Walls.
- (8.) Roof.
- (9.) Floors, windows, doors, ceilings (soundness).
- (10.) Rooms: Number: area and height; number of bedrooms; windows (area, space, made to open, and whether bottom or top); other means of ventilation; walls (painted or papered).
- (11.) Drainage: Sink; bath; lavatory; floor-gullies; soil-pipes; gullies; gutters around eaves; rain-pipes; ventilation of drains; means of access for inspection; drain under house.
- (12.) Septic tank (if any): Position; construction; dimensions; ventilation; watertight; effluent-disposal; risk of pollution of any water-supply.
- (13.) W.C.: Type; fly-proof; sanitary condition; distance from nearest window or door; distance from wells or other water-supplies.
- (14.) Household refuse: Method of storage; position; method of disposal; frequency of disposal.
- (15.) Water-supply: Public (from mains) spring; well; distance from house; sufficiency; purity; risk of pollution. If well, depth, construction, lining, coping, cover, distance in feet of nearest source of pollution (closet or filth-accumulation of any kind); if cistern, note position, construction, cover (mosquito-proof), cleanliness, connection with W.C., discharge of overflow-pipe.
- (16.) Cleanliness of premises: Light, ventilation, cleanliness.
- (17.) Animals kept (hens, dogs, pigs, &c.): Description, number, where kept, nuisance resulting.
- (18.) Inmates: Adults (male); adults (female); children under sixteen (ages).
- (19.) Remarks: Quarters of servants (number and race); fuller replies to other questions than space allowed.
- (20.) Recommendations.

As a result of the activities of the Department, which were more educative than punitive, the sanitation of Apia has been rapidly brought up to a reasonable standard. The Administration set an example by improving, as rapidly as finance and labour permitted, the conditions prevailing in the buildings under its control. The two largest drainage schemes installed in Apia are at the hospital and the schools. A photograph of the plan of the drainage at the hospital will be found elsewhere in this report (Fig. 19). Most of the work has been done by Native labour under white supervision, with the help of a few Chinese artisans.

For the information of the various workers in plumbing and drainage, none of whom were qualified plumbers or drain-layers, models illustrating the various methods of jointing used in plumbing and the proper arrangement of vents, junctions, &c., in drains, were prepared. These have greatly assisted in improving the standard of work done. (Figs. 3 and 4.)

#### WATER-SUPPLIES.

The reticulation of Apia with a high-pressure water-supply system has been completed. In several villages water has been piped into the villages from springs in the hills. In other villages where such is not possible, large reinforced-concrete tanks are being erected to receive the rain-water from church buildings. The type of tank is shown among the illustrations (Fig. 16). A plan (Fig. 17) is also given of the type of concrete bath and shower installed in Native villages with reticulation water-supplies.

#### VITAL STATISTICS (SAMOAN).

The Native population of Western Samoa at the census of the 17th April, 1921, was 32,601. By the 31st December, 1922, the population had increased to 33,685 (estimated).

During 1923, 1,701 live births were reported, and 1,398 deaths, giving an excess of births over deaths of 303.

The departures from Western Samoa (982) exceeded the arrivals (794) by 188. The population at the 31st December, 1923, was therefore 33,800—a net increase of 115 for the year. The mean population for the year was estimated to be 33,685.

#### BIRTHS.

The births of 1,701 living children (Samoan) were registered in Western Samoa during 1923, as against 1,622 in 1922: the birth-rate was thus 50·49 per 1,000 of mean population, as against 48·52 per thousand for 1922. The number of live births in 1923 is the second highest recorded, the highest being 1,792 for 1912, with a population of 34,239. (Note.—Still-births, of which 21 were registered during the year, are not included either as births or deaths in the various numbers and rates given in this report.)

Sixteen pairs of twins were registered, of which both were males in seven instances, both females in six, and in three instances one male and one female.

#### Births of Samoans, Western Samoa, 1923 :—

|         |    |    |    |    | Males. | Females. | Total. |
|---------|----|----|----|----|--------|----------|--------|
| Savai'i | .. | .. | .. | .. | 301    | 296      | 597    |
| Upolu   | .. | .. | .. | .. | 557    | 547      | 1,104  |
|         |    |    |    |    | 858    | 843      | 1,701  |

#### Births by months :—

|           |    |    |    |    | Males. | Females. | Total. |
|-----------|----|----|----|----|--------|----------|--------|
| January   | .. | .. | .. | .. | 71     | 71       | 142    |
| February  | .. | .. | .. | .. | 58     | 55       | 113    |
| March     | .. | .. | .. | .. | 84     | 73       | 157    |
| April     | .. | .. | .. | .. | 67     | 66       | 133    |
| May..     | .. | .. | .. | .. | 79     | 82       | 161    |
| June      | .. | .. | .. | .. | 66     | 81       | 147    |
| July      | .. | .. | .. | .. | 77     | 90       | 167    |
| August    | .. | .. | .. | .. | 69     | 61       | 130    |
| September | .. | .. | .. | .. | 71     | 76       | 147    |
| October   | .. | .. | .. | .. | 78     | 56       | 134    |
| November  | .. | .. | .. | .. | 86     | 65       | 151    |
| December  | .. | .. | .. | .. | 52     | 67       | 119    |
|           |    |    |    |    | 858    | 843      | 1,701  |

#### DEATHS.

The number of deaths registered during the year was 1,398, as compared with 899 in 1922. The relatively large increase was due to an epidemic of dysentery, referred to elsewhere in this report. The crude death-rate was 41·50 per 1,000 of mean population.

The new system of registration of deaths of Samoans, fully described in last year's report, and introduced on the 1st January, 1923, has made it possible to tabulate the deaths under one year of age with a reasonable degree of accuracy, with the exception of deaths occurring during the twelfth-month. This difficulty will not appear in the future, as it will be possible to check records of deaths at twelve months of age by reference to the Births Register. In the table given on the following page, deaths at twelve months of age have been included in the totals given under heading "1 year."



FIG. 1. Photograph showing the "outfit" used for treatment. Note the small dippers of 3 cc. and 1 c.c. capacity for measuring doses of carbon tetrachloride and the aluminium cups. By forming up the Natives in rows, according to size rather than to age, and using the dippers and a supply of cups, it is possible to treat large numbers in a very short time.

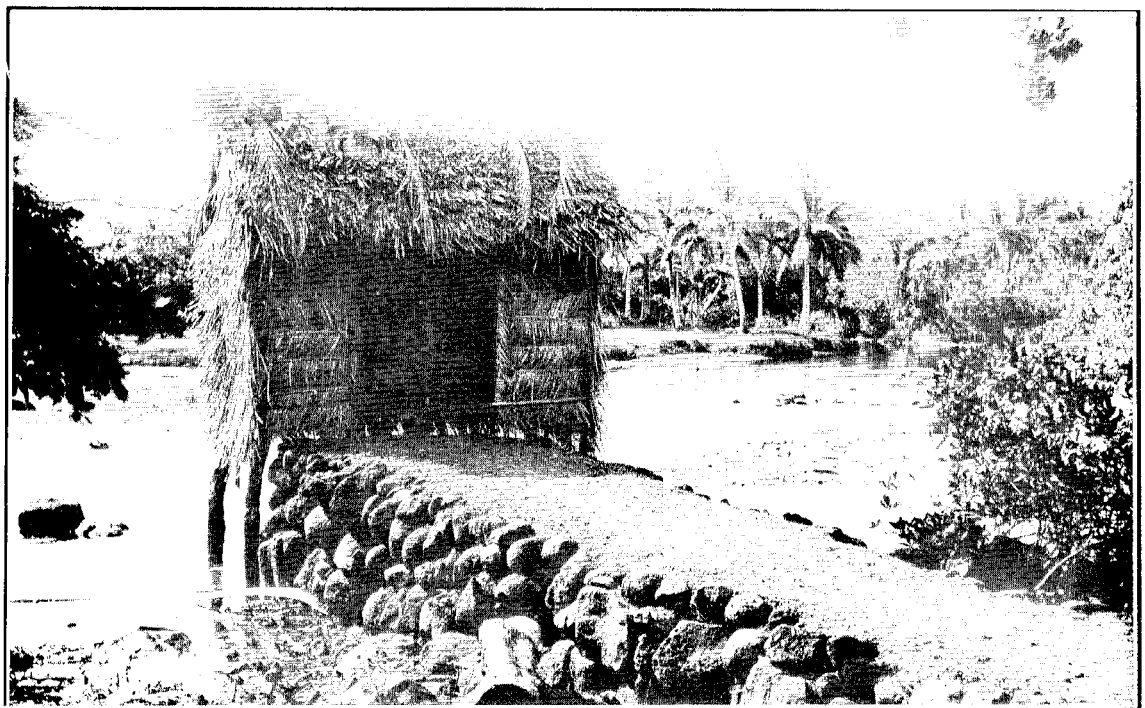


FIG. 2. Native "drop" latrine which is being installed where possible in villages on the coast.

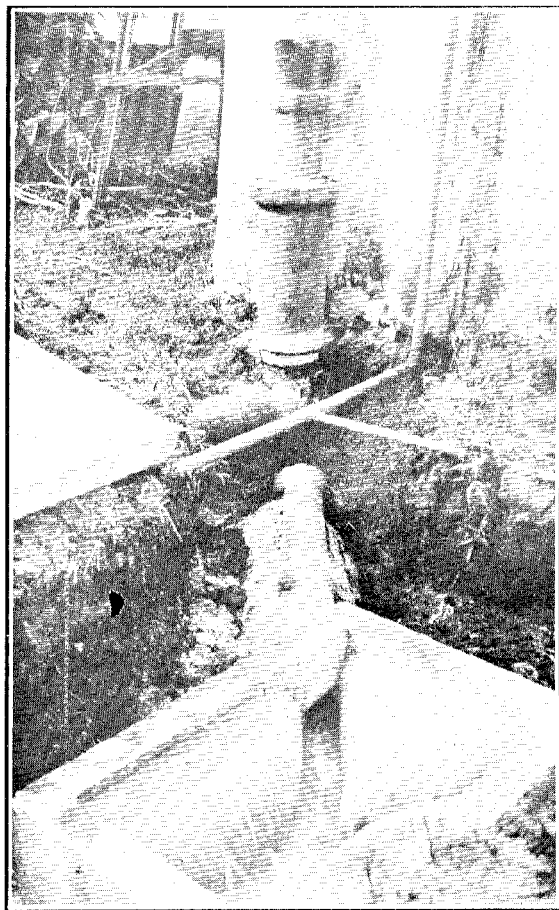


FIG. 3. Old drainage, with new system being installed. Note the 4 in. earthenware pipe, then a 6 in., and finally a 4 in. pipe with 90 per cent. bend. Earthenware instead of cast iron. No terminal vent. No anti siphon vent.

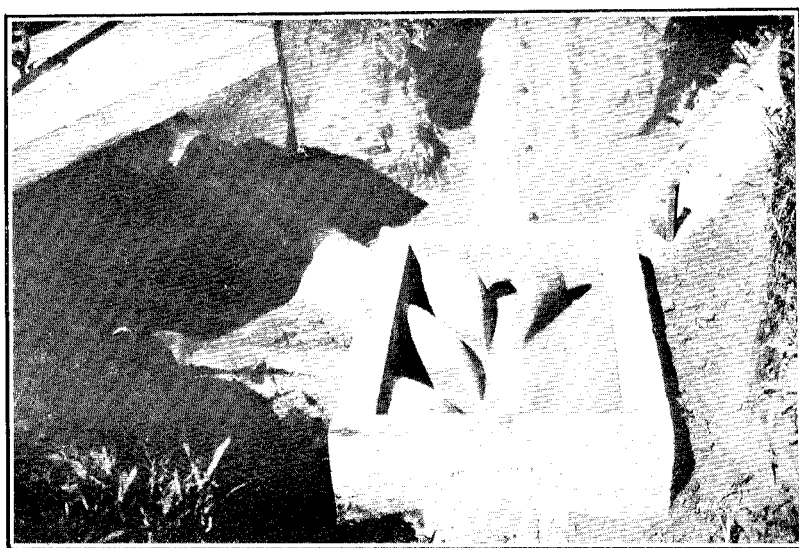


FIG. 4. This manhole shows the work of a Samoan-born laborer, after a little more than twelve months' training.

## Western Samoa.—Deaths of Samoans, 1923.

|                       | Still-births. | Age in Weeks. |    |    |    | Age in Months. |    |    |    |    |    |    |    |    |    |    | Total 1 to 11 Months. |
|-----------------------|---------------|---------------|----|----|----|----------------|----|----|----|----|----|----|----|----|----|----|-----------------------|
|                       |               | 1             | 2  | 3  | 4  | 1              | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |                       |
| SAVAI'I—              |               |               |    |    |    |                |    |    |    |    |    |    |    |    |    |    |                       |
| Male ..               | 4             | 5             | .. | .. | 1  | 4              | 4  | 3  | 5  | 3  | 13 | 8  | 9  | 9  | 5  | 6  | 69                    |
| Female ..             | ..            | 4             | .. | 1  | 2  | 2              | 3  | 2  | 2  | 2  | 4  | 2  | 12 | 8  | 3  | 7  | 47                    |
| Total ..              | 4             | 9             | .. | 1  | 3  | 6              | 7  | 5  | 7  | 5  | 17 | 10 | 21 | 17 | 8  | 13 | 116                   |
| UPOLU—                |               |               |    |    |    |                |    |    |    |    |    |    |    |    |    |    |                       |
| Male ..               | 10            | 17            | .. | 2  | 3  | 1              | 8  | 5  | 8  | 11 | 14 | 13 | 10 | 19 | 12 | 26 | 127                   |
| Female ..             | 7             | 8             | 3  | 3  | 4  | ..             | 5  | 5  | 6  | 14 | 7  | 15 | 10 | 17 | 13 | 14 | 106                   |
| Total ..              | 17            | 25            | 3  | 5  | 7  | 1              | 13 | 10 | 14 | 25 | 21 | 28 | 20 | 36 | 25 | 40 | 233                   |
| TOTAL, WESTERN SAMOA— |               |               |    |    |    |                |    |    |    |    |    |    |    |    |    |    |                       |
| Male ..               | 14            | 22            | .. | 2  | 4  | 5              | 12 | 8  | 13 | 14 | 27 | 21 | 19 | 28 | 17 | 32 | 196                   |
| Female ..             | 7             | 12            | 3  | 4  | 6  | 2              | 8  | 7  | 8  | 16 | 11 | 17 | 22 | 25 | 16 | 21 | 153                   |
| Total ..              | 21            | 34            | 3  | 6  | 10 | 7              | 20 | 15 | 21 | 30 | 38 | 38 | 41 | 53 | 33 | 53 | 349                   |

|                       | Age in Years. |    |    |    |    |    |    |    |   |    | Total, 1 Year to 10 Years. | Deaths, over 10 Years of Age. | Age not stated. | Total Deaths. |  |
|-----------------------|---------------|----|----|----|----|----|----|----|---|----|----------------------------|-------------------------------|-----------------|---------------|--|
|                       | 1             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9 | 10 |                            |                               |                 |               |  |
| SAVAI'I—              |               |    |    |    |    |    |    |    |   |    |                            |                               |                 |               |  |
| Male .. ..            | 73            | 18 | 5  | 2  | 1  | 1  | 4  | 3  | 2 | .. | 109                        | 91                            | 8               | 283           |  |
| Female .. ..          | 42            | 15 | 14 | 5  | 1  | 4  | 3  | .. | 2 | 2  | 88                         | 80                            | 4               | 226           |  |
| Total .. ..           | 115           | 33 | 19 | 7  | 2  | 5  | 7  | 3  | 4 | 2  | 197                        | 171                           | 12              | 509           |  |
| UPOLU—                |               |    |    |    |    |    |    |    |   |    |                            |                               |                 |               |  |
| Male .. ..            | 119           | 30 | 9  | 10 | 4  | 8  | 4  | 3  | 3 | 2  | 192                        | 124                           | 7               | 472           |  |
| Female .. ..          | 82            | 33 | 15 | 5  | 7  | 11 | 8  | 9  | 2 | 3  | 175                        | 106                           | 11              | 416           |  |
| Total .. ..           | 201           | 63 | 24 | 15 | 11 | 19 | 12 | 12 | 5 | 5  | 367                        | 230                           | 18              | 888           |  |
| TOTAL, WESTERN SAMOA— |               |    |    |    |    |    |    |    |   |    |                            |                               |                 |               |  |
| Male .. ..            | 192           | 48 | 14 | 12 | 5  | 9  | 8  | 6  | 5 | 2  | 301                        | 215                           | 15              | 755           |  |
| Female .. ..          | 125           | 48 | 29 | 10 | 8  | 15 | 11 | 9  | 4 | 5  | 264                        | 186                           | 15              | 643           |  |
| Grand total ..        | 317           | 96 | 43 | 22 | 13 | 24 | 19 | 15 | 9 | 7  | 565                        | 401                           | 30              | 1,398         |  |

|            | Jan. | Feb. | Mar. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Total. |
|------------|------|------|------|--------|------|-------|-------|------|-------|------|------|------|--------|
| Males ..   | 72   | 67   | 54   | 58     | 71   | 104   | 112   | 68   | 41    | 44   | 37   | 27   | 755    |
| Females .. | 56   | 51   | 62   | 44     | 63   | 91    | 92    | 51   | 32    | 31   | 40   | 30   | 643    |
| Total ..   | 128  | 118  | 116  | 102    | 134  | 195   | 204   | 119  | 73    | 75   | 77   | 57   | 1,398  |

Of the 34 deaths shown as occurring during the first week after birth, the majority occurred during the first few hours of life, and must be regarded as the natural result of native methods of midwifery in cases of difficult labour.

It will be noticed that of the 1,398 deaths, 719 were of children who had not reached the age of two years. This is again referred to elsewhere in this report.

Nine women died in childbirth.

## EPIDEMIC YEARS.

A comparison of the returns for 1923 with other years when the country suffered from epidemics may be of interest :—

| Year.      | Population. | Births. | Deaths. | Excess of Births over Deaths. | Excess of Deaths over Births. | Epidemic.              |
|------------|-------------|---------|---------|-------------------------------|-------------------------------|------------------------|
| 1907 .. .. | 33,354      | 1,389   | 1,564   | ..                            | 175                           | Dysentery.             |
| 1911 .. .. | 33,629      | 1,453   | 1,827   | ..                            | 374                           | Dysentery and Measles* |
| 1915 .. .. | 35,554      | 1,611   | 1,451   | 160                           | ..                            | Measles.               |
| 1918 .. .. | 38,093      | 1,509   | 8,437†  | ..                            | 6,928                         | Influenza.             |
| 1923 .. .. | 33,685      | 1,701   | 1,398   | 303                           | ..                            | Dysentery (shiga).     |

\* Measles first visited Samoa in 1893, and caused a large number of deaths, but, as records were not kept at that time, no definite figures are available. Its second appearance was in 1911.

† As far as can be judged from the records available, both these figures are considerably overestimated, the figure for deaths being approximately 1,300 overestimated.

## POPULATION, PAST AND PRESENT.

The first estimate of the population of Western Samoa available is that of Commodore Wilkes, of the United States Navy, who visited these islands between 1838 and 1842. His estimate was 46,600 for what is now known as Western Samoa—i.e., the islands of Upolu, Savai'i, Manono, and Apolima.

In 1845 a census was taken by the London Missionary Society and the population given as 40,000. The Rev. J. B. Stair, who was resident in Samoa when this census was taken, considers it as an underestimate, but states that the population was certainly not more than 45,000. Captain Erskine, R.N., in 1849 reckoned the population at 32,000.

In the *Samoa Recorder* of January, 1854, a paper published under the auspices of the London Missionary Society, the population is given as 29,237. The figures given for 1854 are probably fairly accurate. The London Missionary Society had by that time become firmly established, and its churches were dotted throughout the group. It was probably in a very good position to get accurate returns through its native pastors.

The above figures, even if taken as only approximate, show a rapid progressive decline during the period 1839 to 1854. The writings of the early missionaries and navigators furnish the reason for this. Thus Erskine, in his "Journal of a Cruise among the Islands of the Western Pacific," after giving his estimate of the population, says, "This number, it is to be feared, is still gradually though slowly diminishing. For some years past the islands are said to have been visited during the wet season (October to April) with a severe species of influenza, which has sometimes passed through the group twice during that time. From November to January, 1847, this epidemic was unusually severe, sixty deaths having been reported in one district of 2,500, and even a larger proportion in some marshy and damp situations. During last year the whooping-cough, said to have been imported in a vessel from Tahiti, made its appearance for the first time, causing, in conjunction with the war, but in a larger proportion, a calculated reduction of 5 per cent. of the population in a period of eighteen months."

The Rev. J. B. Stair, who resided in Samoa from 1838 to 1845, says, in "Old Samoa":—

"The population of Samoa, when compared with that of other groups, is large, but there are good reasons for thinking that it was much larger formerly, before Europeans first settled amongst them. For many years before the introduction of Christianity it had been steadily decreasing, principally in consequence of the ferocious and bloody wars in which the Natives so constantly engaged. In various parts of Upolu I have often noticed traces of a much larger population, and the general testimony of the Natives confirmed this belief. Sites of deserted villages and remains of plantation walls could often be seen in the wild bush; and in many parts of the islands places once largely populated have now very reduced numbers.

"More than a century ago (1784), La Perouse, in writing of a district at the east end of Upolu, says: 'At 4 o'clock in the afternoon we brought to abreast of perhaps the largest village that exists in any island of the South Seas, or rather, opposite a very extensive inclined plane covered with houses from the summit of the mountains to the water's edge.' And again: 'We saw the smoke rise from the interior of the village as from the midst of a great city.' Since that time this district, in common with many others, has been frequently devastated by sanguinary wars, in which the slaughter was great. The population, at the time I knew it, was extensive as compared with other districts, but was confined to the coast. The inland districts and settlements of which La Perouse speaks had disappeared. This is the case generally throughout the islands; but few inland villages remain in any island, with the exception of Upolu, where some fifty-four are found; whilst on Savai'i there are only thirty-eight.

"On the mountains in the neighbourhood of Falelatai, where, in 1840 all was bush, there had been formerly extensive villages; whilst the road over the mountain, leading across from that place to Fasito'otai, a distance of nine or ten miles, was at one time lined with detached habitations, so that the Natives, in describing it to me, have often said that a child might have travelled from one place to the other alone, the parents feeling no anxiety about it, in consequence of the houses being so near to each other along the whole distance. At the time I often traversed it the track was quite deserted, not a house being found throughout the whole distance; but ample evidence still existed of former settlements. Even as late as 1829, a populous village existed between the two places, the site of which, at the time I visited it, was comparatively clear. Many of its inhabitants were killed in the war

which devastated the village of A'ana in 1830, and the survivors were scattered among other villages. Disease also did its part towards the depopulation of the islands, since the remedies of the people were few, and their habits and mode of life favoured its progress.

"Of the population in 1845 it is possible to speak with tolerable accuracy, since a successful census was made at that time. But even then, through Native prejudices, it was difficult to obtain correct returns from some of the districts. It was considered that the population at that time was about 40,000—an underestimate, probably, but it certainly did not exceed 45,000."

The Rev. George Turner, in "Nineteen Years in Polynesia" (London, 1861), states: "Influenza is a new disease to the Natives. They say that the first attack of it ever known in Samoa was during the A'ana War in 1830, just as the missionaries Williams and Barth first reached their shores. Ever since there have been returns of the disease almost annually. They have a tradition of an epidemic answering to the description of cholera, which raged with fearful violence many years ago. In 1849 whooping-cough made its appearance, and prevailed for several months, among adults as well as children. A good many of the children died. In 1851 another new disease surprised the natives—viz., the mumps."

Fiji experienced a devastating epidemic of dysentery about the year 1800, and it is probable that the epidemic mentioned by Rev. G. Brown was of a similar nature.

Sufficient has been written to show that the population of Samoa was decreasing, and decreasing rapidly, during the first half of the nineteenth century. Whether the decrease continued after 1854 or not there are no records available in Samoa to show, but in 1886 the population was estimated to be 29,000 (John B. Thurston, "Correspondence respecting the Affairs of Samoa, 1885-1889," Blue-book, Samoa No. 1, 1889), practically the same figure as for 1854.

The increase in the population from that date onwards must have been fairly rapid, as, despite a serious setback in 1893, when measles were first introduced, the population, according to the German census of 1906, was 33,478. From that date the state of the population is shown in the graph (Fig. 15).

On the graph there are several points of interest. The drop shown in 1907 was due to an epidemic of dysentery. That in 1911 was, to the extent of 354, due to measles and dysentery, but the rest of the decrease was due to the census returns showing a smaller population than the estimates based on the first census. This indicates a more careful checking of returns than probably took place at the time of the 1906 census, with the elimination of those cases of duplication which have to be guarded against in Samoa. The Samoans do a great deal of travelling from district to district, and when the census is taken the travellers are more than likely listed in the returns from two villages, the *pulemu'u* of their home village including their names in his returns in order to show the true size of his village—this in spite of instructions to the contrary. Thus the danger in Samoa is not that the population will be underestimated, but rather that it will be overestimated by approximately the number of Natives who are on *malaga* at the time of the census. That this is so is shown by our experience in the 1921 census. The first count of the returns showed a population of 33,336, but a careful rechecking of the returns during the succeeding twelve months showed duplications to the number of 735, the final return thus showing a population of 32,601. The same care was not shown in checking the census of 1917, taken during military occupation, and therefore the estimate of the population of Samoa at that date must be rejected as too high.

In the graph the population as at 31st December each year is given, and for 1917 the population as calculated from the census (37,572), and also as estimated by calculating from the previous census in 1911 (36,592).

In 1918 the population was estimated, calculating from the 1917 census, to have increased to 38,093 by the 1st October. During the quarter October-December, influenza caused an estimated decrease of the population from that figure to 30,738. But, as already pointed out, the population was estimated at too high a figure, and therefore the calculated number of deaths must be reduced by approximately the difference between the estimated population and the population as calculated from the previous census.

Again, by calculating back from the 1921 census, taking into account the births and deaths, arrivals from and departures for overseas, the population on the 31st December, 1918, is found to have been 31,200—not 30,738, as estimated at the time.

The fact that returns totalling 7,542 deaths were sent in by Native officials does not mean that that number actually died. The time was one of great disorganization; numbers of the Native officials had died, and their work was being carried out by untrained men; and, in addition, no careful checking of the returns to eliminate duplications was carried out. It is now impossible (and it is doubtful if it was ever possible with the information available) to obtain accurate information as to the actual death-roll of Samoans, but, as the above figures indicate, it is reasonable to assume that it has been markedly overestimated.

#### LEPROSY IN WESTERN SAMOA.

The navigators and missionaries who visited the South Pacific in the early years of last century mention leprosy, or a disease resembling leprosy, as being common amongst the various islanders. The Rev. George Turner, who lived in Samoa from 1841 to 1861, includes, in his book "Nineteen Years in Polynesia," published in 1861, "a species of leprosy" in his list of the principal diseases of Samoa. He continues, "Leprosy has greatly abated. The Natives say that formerly many had it and suffered from its ulcerous sores until all the fingers of a hand or the toes of a foot had fallen off." The Rev. George Brown, who lived in Samoa from 1860 to 1874, in "Melanesians and Polynesians," published 1910, says, "I knew of one very bad case of leprosy which I had under constant observation until the man died. He remained in the house with his wife and children, but none of them ever showed any signs of the disease."

As even medical men were at that time inclined to confuse ulcerative tertiary yaws with leprosy, evidence such as the above as to the presence of leprosy in these islands cannot be accepted as definite.

NOTE.—In 1893 Dr. James Maxwell, M.D., published his "Observations on Yaws and its Influence in originating Leprosy," in which he described cases typical of ulcerative tertiary yaws, but attributed to leprosy. This probably remained the general teaching throughout the world until 1881, when Dr. Charlouis published "Ueber Polypapilloma Tropicum." Even this paper was largely overlooked by the English-speaking races till Dr. Numa Rat published his "Yaws: its Nature and Treatment," in 1891. So that any reference to leprosy prior to 1881, or even 1891, in Samoa, where yaws is known to have been endemic, can only be accepted even by a medical witness where a clear history of the case be given. That yaws was by some clearly distinguished from leprosy is shown by the admirable account given of it in Demarara by R. Easton in 1834.

The evidence put forward by Cantlie ("Prize Essays on Leprosy," by Thomson and Cantlie—the New Sydenham Society, London, 1897) that leprosy was comparatively recently introduced into the Pacific islands is much more definite. Cantlie is of opinion that leprosy first appeared in the Hawaiian (Sandwich) Islands about 1850, and it is of interest to note that one of the first cases of leprosy definitely diagnosed by a medical practitioner in Western Samoa was a Hawaiian, whose photograph is given (Fig. 13).

The first medical evidence of the presence of leprosy in Samoa is that of Dr. F. H. Davies in 1892. In "Prize Essays on Leprosy" is quoted a letter from Dr. Davies, of the London Mission, Tuasivi, Savai'i, in which he states: "I mentioned in my paper read at the Intercolonial Medical Congress held at Sydney, September, 1892, that we had in Samoa two cases of leprosy, both Chinese, and a suspected case in the person of an Hawaiian (Sandwich) Islander. One of the Chinamen died three years ago, and the other was deported. From evidence collected for (from?) an African-English resident it would seem that at the present moment, in addition to the Hawaiian mentioned above, two half-caste Samoans and one pure Samoan are believed to have leprosy. I have never seen a case of leprosy among my numerous patients. Few, very few Chinamen are in Samoa, perhaps half a dozen at most. I do not think leprosy has ever been endemic in Samoa."

The next references to leprosy to be found in the records are found in the German medical reports of 1903 to 1910 (*Medizinal Berichte uber die Deutschen Schutzgebiete*). Report 1904-5: The last Samoan with leprosy died during the previous report year. Report 1907-8: Three cases of leprosy have come under notice—a white settler, a Melanesian, and a Chinese-Samoan half-caste. In all, eight cases of leprosy have been noted since 1896—one German, one Englishman, one American, one British-Samoan half-caste, one Polynesian, two Melanesians, and one Chinese-Samoan half-caste. (Note: Two of these are believed to have come from Hawaii.) Report 1809-9: The German leper died 20th November, 1908. There are now only two cases of leprosy known in Samoa—Chinese-Samoan half-caste girl and a Melanesian. Report 1909-10: During the report year four further cases of leprosy have been notified besides the two already known. They come from different villages lying far apart one from another. These four cases were advanced, and were therefore not infections of recent date. Reports 1910-14: Not available for reference.

When the New Zealand troops entered the Territory in 1914 there were twelve lepers in the station built at Ali—one German, one Melanesian, one British-Samoan half-caste, and, so far as can be gathered from their names, nine Samoans. It is probable that of these twelve most, if not all, of the six cases known in 1909-10 are included.

From 1914 until the 31st December, 1923, the following cases were discovered: 1915—three Chinese, one German; 1916—one Chinaman, one Samoan; 1917—one Samoan, one Raratongan (found to be a leper on arrival as one of the crew of an island trading ship), one Chinaman; 1920—one British-Samoan half-caste, two Samoans (females); 1921—one British-Samoan half-caste girl, three Samoans (two males, one female); 1922—one Chinaman, one Samoan (male); 1923—two Chinese, four Samoans (three males, one female).

Of the forty-four known cases of leprosy in the period 1892 to 1923, the nationalities were as follows: Englishman, 1; Germans, 3; American, 1; half-castes of above nationalities, 3; Chinese, 10; Raratongan, 1; Chinese-Samoan half-caste, 1; Melanesians, 2; Samoans, 22; total, 44.

All those reported before 1914 are now dead. Of the twenty-four reported since 1914, all are alive except one German, three Chinese, and two Samoans.

Chinese indentured labour was not introduced into Samoa until 1903, and the first recorded case of leprosy amongst indentured Chinese occurred in 1915. Since that date eight Chinese have been found suffering from leprosy.

The increase in number of Samoans found suffering from leprosy is probably due more to the extension of the medical service throughout the islands leading to an increase in the number of cases discovered rather than to increase in incidence of the disease.

The German leper station at Ali, on the mainland of Upolu, was found to be unsuitable owing to escape being fairly easy and to lack of facilities for expansion, and in 1918 the lepers were transferred to a new station on the island of Nu'utele, off the eastern end of Upolu. The isolated position of the station made it impossible to give them the treatment necessary for the cure or alleviation of their condition—all that could be done being done by the praiseworthy ministrations of a Sister of the Society of Mary and the Roman Catholic priest on the mainland opposite the island. In order to give these lepers an opportunity of treatment, arrangements were made with the Fiji Government for them to be admitted to the lepers asylum at Makogai—the beautifully situated and splendidly equipped station under its control.

In July and August, 1922, thirteen lepers (including one from American Samoa not included in the foregoing figures) were transported to Fiji, and in May of this year six more will be added to the number already there.

#### GROWTH OF THE MEDICAL SERVICE.

During the period 1900-14, during which Western Samoa was under German control, a commencement was made to organize a Government medical service, but much more attention was paid to the medical wants of the Europeans and the contract labourers than of the Samoans. The illustration (Fig. 14) reproduced in this report, taken from the German Annual Medical Report of 1907-8 (*Medizinal-Berichte uber die Deutschen Schutzgebiete*, 1907-8) shows the growth of the hospital from its commence-

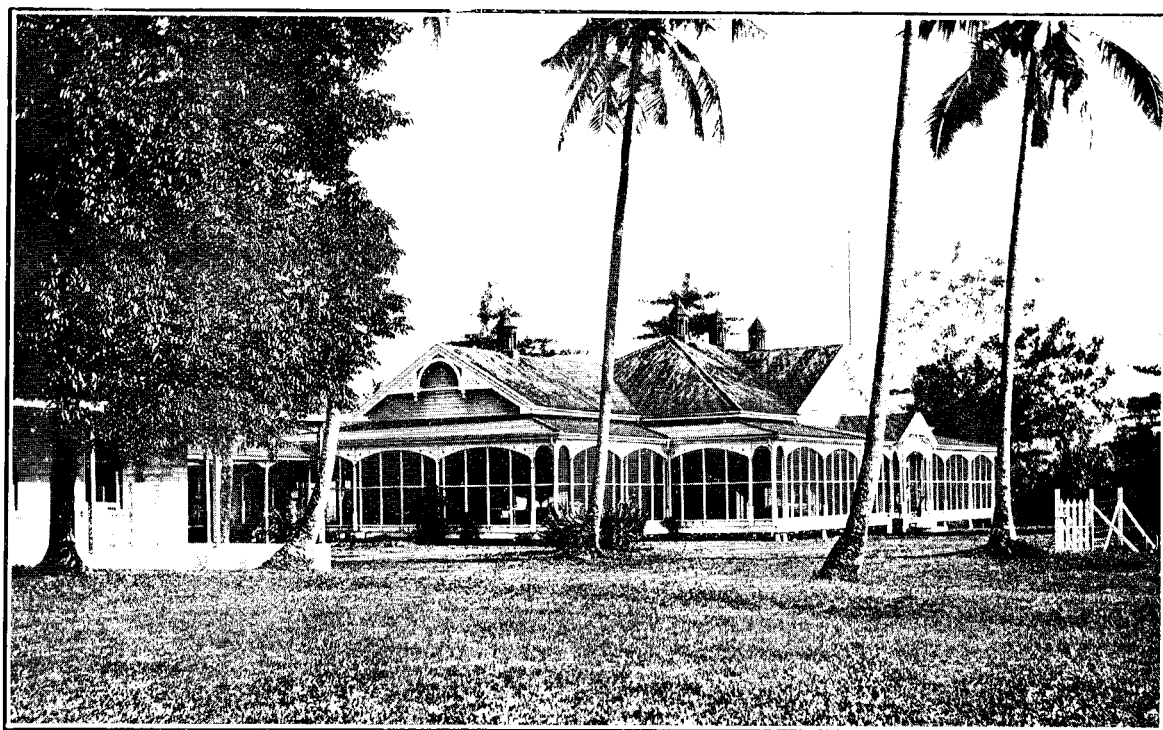


FIG. 5. European Hospital, Apia. Built, 1902; mosquito-netted, 1921.

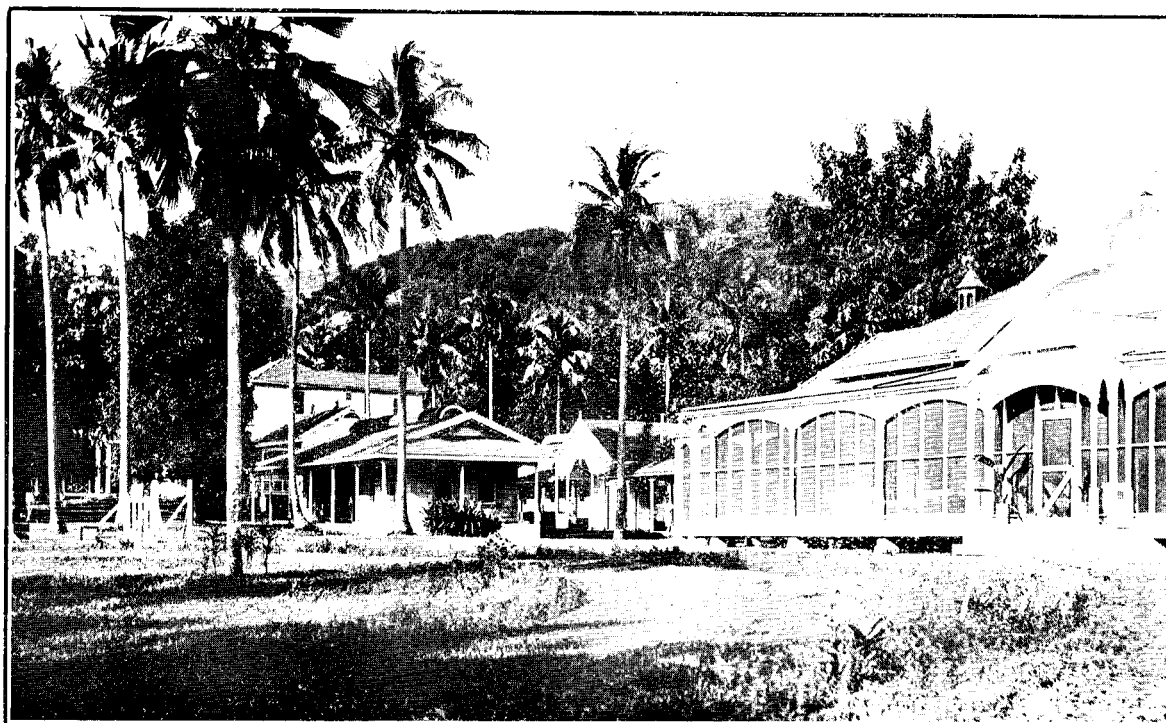


FIG. 6. Hospital, Apia. (For identification of buildings refer to Fig. 19.)



FIG. 7. Portion of Samoan section of Apia Hospital. The *fales* in the background are the isolation *fales*.

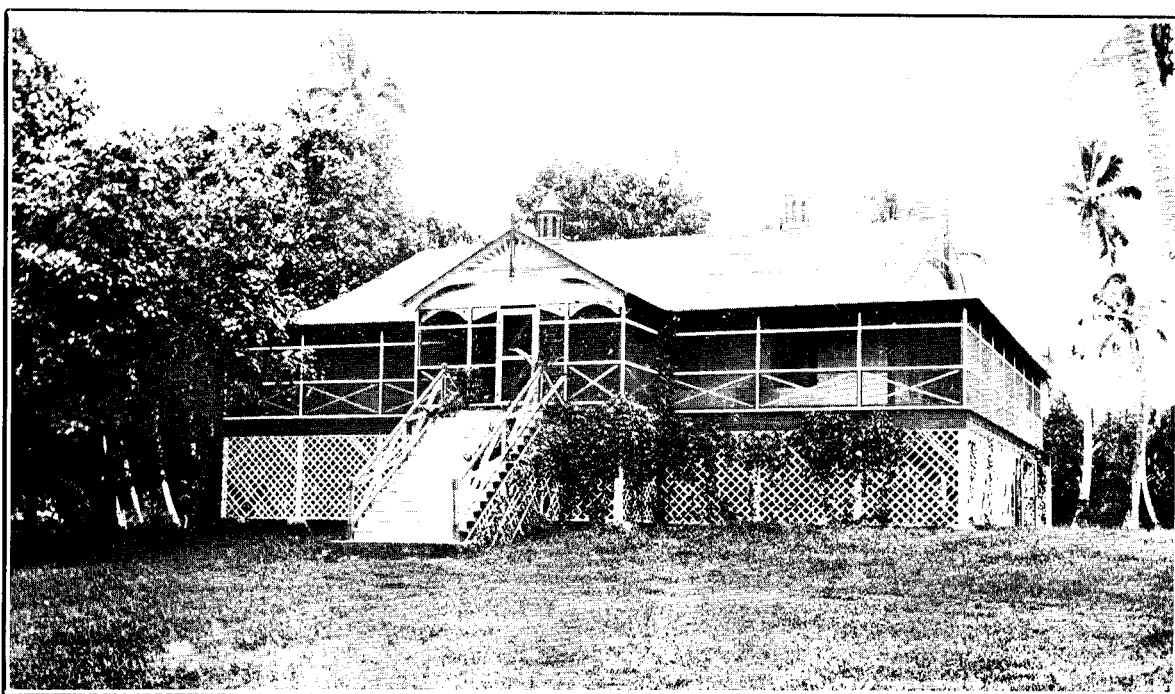


FIG. 8. Apia Hospital: European nurses' quarters.

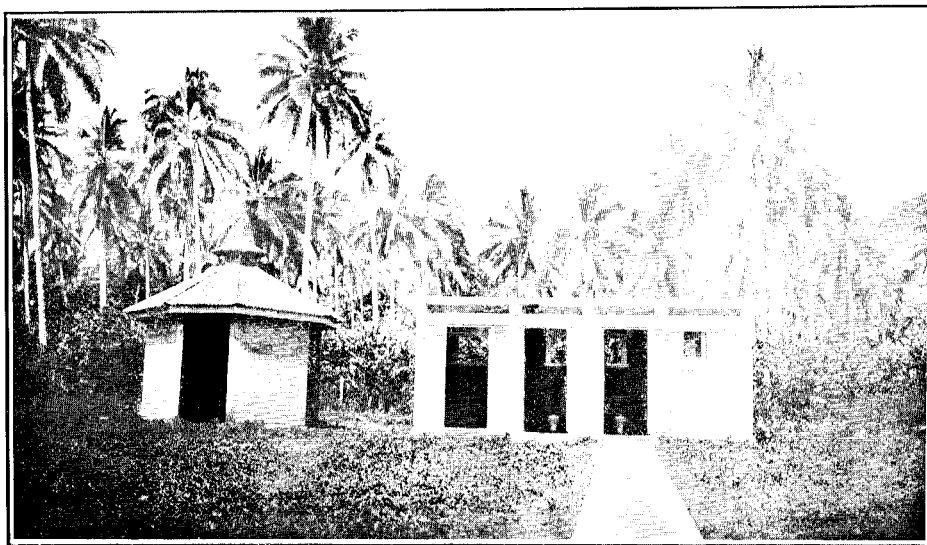


FIG. 9 (see also Figs. 21 and 22). Cookhouse is used for cooking food, but storing of food in it is not permitted.

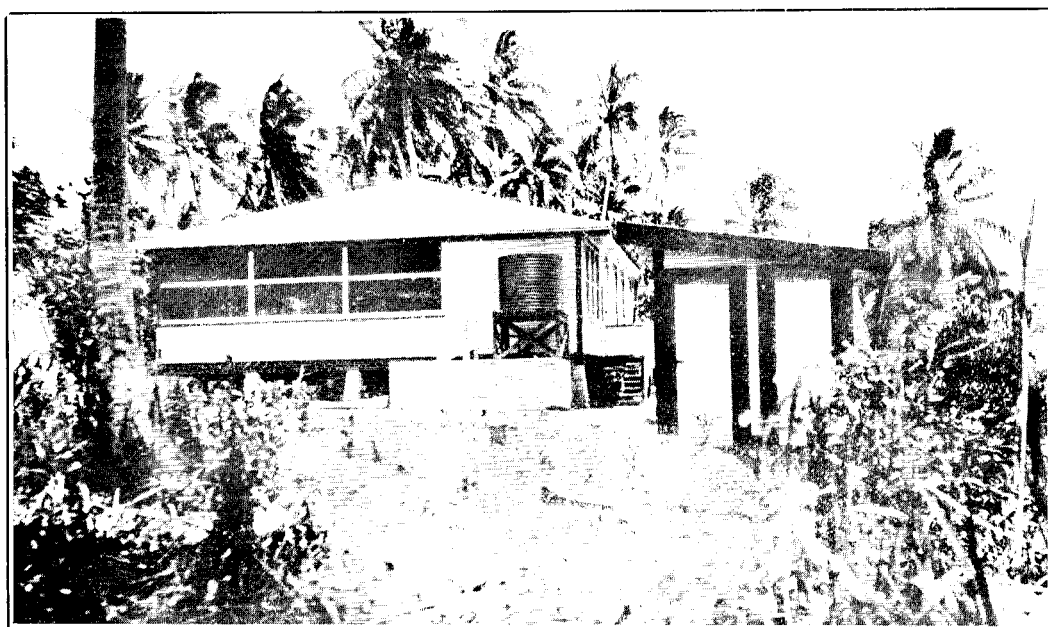


FIG. 10. Residence of Medical Officer at Lalomann, Meipata. (For plan, see Fig. 21.)



FIG. 11. District Hospital at Lalomann, in the Meipata district. This photograph was taken on completion of the buildings, before the grounds had been cleaned up.

A.—4A.

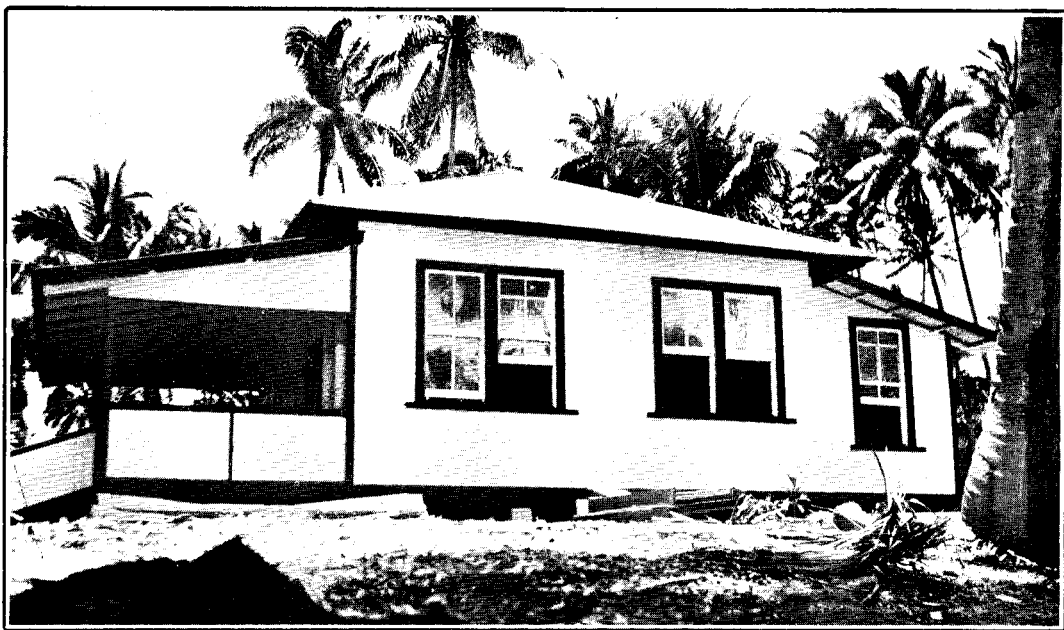


FIG. 12. Dispensary at Lalomani, Aleipata district (also shown in Fig. 11).



FIG. 13. Photograph of a Hawaiian, one of the first cases definitely diagnosed as leprosy in Western Samoa.

ment in 1902. In 1914 the position was the same, except that *fale* No. 3 had disappeared, and *fale* No. 6 had been replaced by a half-Samoan half-European house. During military occupation a female ward for Samoans was erected, and since 1920 extensive additions have been made, consisting of ten *fales* (Samoan houses) with concrete floors, a laboratory, and offices. In addition, the European hospital and the Samoan female ward have been enclosed with mosquito-netting, and modern drainage installed. The accompanying plans and photographs of the hospital (Figs. 5 to 8, and 18 to 21) as it appears to-day indicate the advance that has been made in the last few years.

*District Medical Hospitals.*—In 1921 the first medical out-station was opened at Tuasivi, Savai'i, and in April, 1924, a second one was opened at Aleipata, Upolu. These out-stations, which consist of a residence, a dispensary, and three *fales* for patients, are each under the control of a European medical practitioner, assisted by a dresser, who acts also as interpreter, and two trained Samoan nurses. Figs. 10, 11, and 12 show the new station at Aleipata.

*Dispensaries.*—Until a year ago the only attempt made to reach the Natives beyond reach of the hospitals at Apia and Tuasivi was by means of infrequent *malagas*, or journeys, by medical officers. Before that time the work of attending to the medical wants of the Natives was carried out by the various missionary societies, to whom great credit must be given for the time and money they spent. By the beginning of 1923 sufficient nurses had been trained to allow of some being sent out to districts, and during the year four trained Samoan nurses have been allotted to different mission stations. This number will be increased as trained nurses become available.

Figure 14 shows the extent to which medical assistance is available to the Samoans at the present time.

#### REPORT OF THE RESIDENT MEDICAL OFFICER ON THE CASES TREATED AT THE APIA HOSPITAL, 1923-24.

The outstanding feature of the year has been the introduction of a medical-tax for the Samoan population, in place of a system of payment for treatment received. In consequence of this change I am forwarding the annual returns for the year 1922-23 to compare with those of the present year.

On the whole, the figures of the two years are very similar, the main increase in the number of admissions to hospital having been due to the dysentery epidemic, on which a separate report is forwarded.

It will be noted that during the last few months of the year the major surgical operations showed a tendency to increase, and were considerably in excess of those of the previous year. The reason for this excess is difficult to find, but probably it was due to more than one cause—the most important being the collection of the medical-tax.

The greatest increase in the work at the hospital has taken place in the out-patient department, especially in the number of dressings for open sores and the number of N.A.B. injections that have been given for yaws in its various stages. It is disappointing to note that the majority of the cases do not return for their full course of injections, but this will probably improve as more instruction is given on the disease.

Gastro-intestinal disorders still form the largest group of admissions to the hospital, and are the most important because of the great infantile mortality which they produce. Probably a large proportion of the deaths that have been recorded as due to broncho-pneumonia were secondary to an original gastro-enteritis. Nearly all our pneumonia deaths were in young children, and were so rapidly fatal that there was little chance of obtaining much clinical evidence; no post-mortem examinations were made, due to the reluctance of the Samoan to submit to such examination, so that the accuracy of the diagnosis in these cases may well be doubted.

Filariasis will not be mentioned in this report, except to state that this infection is believed to play an important part in producing the large number of deep muscular abscesses that are so frequently seen in the Samoan population, and also plays some part in producing the hydroceles and elephantoid scrota which form a large part of our operation cases. In the records of operations, hydroceles are those cases where this is the most noticeable condition present, whereas elephantoid scrota are cases in which the elephantoid tissues predominate, although hydroceles may be, and in fact usually are, present.

The number of patients treated in the Chinese wards shows a considerable decrease on those of the last year. This is due to the fact that now only serious operation cases and infectious diseases receive treatment, together with a few cases from the district surrounding the hospital—the majority of the minor cases being treated at the Sogi Hospital.

JOHN S. ARMSTRONG,  
Resident Medical Officer.

#### APIA HOSPITAL.—ATTENDANCE, OPERATIONS, ETC., FOR THE YEAR 1923-24.

|                                                                                                                                                           |    |    |    |    |    |    |    |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|---------|
| General attendance (includes out-patient attendance, out-patient dressings, N.A.B. injections for yaws, and out-patient injections for elephantoid fever) |    |    |    |    |    |    |    | 37,279  |
| Out-patient attendance (Europeans and Samoans)                                                                                                            |    |    |    |    |    |    |    | 10,777  |
| Out-patient dressings (Europeans and Samoans)                                                                                                             |    |    |    |    |    |    |    | 12,546  |
| N.A.B. injections (Europeans and Samoans)—                                                                                                                |    |    |    |    |    |    |    |         |
| First injections                                                                                                                                          | .. | .. | .. | .. | .. | .. | .. | 7,744   |
| Second injections                                                                                                                                         | .. | .. | .. | .. | .. | .. | .. | 4,093   |
| Third injections                                                                                                                                          | .. | .. | .. | .. | .. | .. | .. | 1,202   |
|                                                                                                                                                           |    |    |    |    |    |    |    | —13,039 |
| European in-patients                                                                                                                                      |    |    |    |    |    |    |    | 184     |
| Samoan in-patients                                                                                                                                        |    |    |    |    |    |    |    | 662     |
| Chinese and Melanesian in-patients                                                                                                                        |    |    |    |    |    |    |    | 166     |
| Chinese and Melanesian out-patients                                                                                                                       |    |    |    |    |    |    |    | 118     |
| Operations—                                                                                                                                               |    |    |    |    |    |    |    |         |
| Major                                                                                                                                                     | .. | .. | .. | .. | .. | .. | .. | 225     |
| Minor                                                                                                                                                     | .. | .. | .. | .. | .. | .. | .. | 270     |
|                                                                                                                                                           |    |    |    |    |    |    |    | —495    |

## APIA HOSPITAL.—CLASSIFICATION OF ADMISSIONS TO THE EUROPEAN WARDS, 1923-24.

|                               | April. | May. | June. | July. | August. | September. | October. | November. | December. | January,<br>1924. | February. | March. | Total. | Deaths. |
|-------------------------------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|-------------------|-----------|--------|--------|---------|
| <i>Alimentary System.</i>     |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Diarrhoea ..                  | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | ..        | ..     | ..     | 1       |
| Duodenal ulcer ..             | ..     | ..   | ..    | 1     | ..      | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Colitis ..                    | ..     | ..   | ..    | ..    | ..      | ..         | 1        | ..        | 1         | ..                | ..        | ..     | 2      | ..      |
| Gastritis ..                  | ..     | ..   | ..    | ..    | ..      | 1          | ..       | ..        | ..        | 1                 | ..        | ..     | 2      | ..      |
| Gastro-enteritis ..           | 1      | ..   | ..    | ..    | 1       | ..         | ..       | ..        | ..        | ..                | 1         | 1      | 4      | ..      |
| Ileus ..                      | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | 1         | 1                 | ..        | ..     | 3      | ..      |
| Parotid tumour ..             | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Poisoning ..                  | ..     | ..   | ..    | ..    | ..      | 1          | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| <i>Respiratory System.</i>    |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Bronchitis ..                 | ..     | ..   | ..    | ..    | ..      | 1          | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Phthisis ..                   | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | 1                 | ..        | ..     | 2      | ..      |
| Pneumonia ..                  | ..     | ..   | ..    | ..    | ..      | 1          | ..       | ..        | ..        | ..                | 1         | ..     | 2      | ..      |
| Tonsils and adenoids ..       | ..     | ..   | ..    | ..    | ..      | 1          | ..       | ..        | ..        | ..                | ..        | 1      | 2*     | ..      |
| <i>Circulatory System.</i>    |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Adenitis ..                   | ..     | 3    | 2     | ..    | 1       | ..         | ..       | ..        | 1         | ..                | ..        | ..     | 7      | ..      |
| Cardiac ..                    | ..     | ..   | ..    | ..    | ..      | ..         | 2        | ..        | ..        | ..                | ..        | ..     | 2      | ..      |
| Lymphangitis ..               | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | 1         | ..     | 1      | ..      |
| <i>Genito-urinary System.</i> |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Abortion ..                   | ..     | ..   | ..    | ..    | ..      | 1          | 3        | ..        | ..        | ..                | ..        | 1      | 5      | ..      |
| Albuminurist                  | ..     | ..   | ..    | ..    | ..      | ..         | ..       | 2         | ..        | ..                | ..        | ..     | 2      | ..      |
| Circumcision ..               | ..     | ..   | ..    | ..    | ..      | ..         | 1        | ..        | ..        | ..                | 1         | ..     | 2      | ..      |
| Confinement ..                | 1      | 1    | 1     | 2     | ..      | ..         | 1        | 1         | ..        | 4                 | 1         | 2      | 14     | ..      |
| Hydrocele ..                  | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | 1                 | ..        | ..     | 1      | ..      |
| Nephritis ..                  | 1      | 2    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 3      | ..      |
| Oorchitis ..                  | ..     | ..   | ..    | ..    | ..      | ..         | 1        | 1         | ..        | ..                | ..        | ..     | 2      | ..      |
| Puerperal fever ..            | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | 1         | 1      | 2†     | ..      |
| Pyelitis ..                   | ..     | ..   | ..    | ..    | ..      | ..         | 2        | ..        | ..        | ..                | ..        | ..     | 2§     | ..      |
| Retention of urine ..         | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | 1                 | ..        | 1      | 2      | ..      |
| Retroversion of uterus ..     | ..     | ..   | ..    | ..    | 1       | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Tabes mesenterica ..          | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | 1         | ..     | 1      | ..      |
| <i>Skin.</i>                  |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Burns ..                      | ..     | 1    | ..    | ..    | ..      | 1          | ..       | ..        | ..        | 1                 | ..        | ..     | 3      | 1       |
| Excision of scar ..           | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | 1         | ..     | 1      | ..      |
| Ulcers ..                     | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | 3                 | 1         | 2      | 7      | 1¶      |
| <i>Supporting Structures.</i> |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Abscess ..                    | ..     | ..   | 1     | ..    | ..      | ..         | 1        | 3         | ..        | ..                | ..        | 2      | 7      | ..      |
| Fractures ..                  | ..     | ..   | ..    | ..    | ..      | 1          | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Injuries and cuts ..          | ..     | 1    | ..    | 1     | ..      | ..         | 1        | ..        | ..        | 1                 | ..        | ..     | 4      | ..      |
| <i>Nervous System.</i>        |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Epilepsy ..                   | ..     | ..   | ..    | ..    | ..      | ..         | 1        | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Neurasthenia ..               | ..     | ..   | ..    | ..    | 1       | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| <i>Special-sense Organs.</i>  |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Conjunctivitis ..             | ..     | ..   | ..    | ..    | ..      | ..         | 1        | ..        | ..        | ..                | 1         | 1      | 3      | ..      |
| Injury to eye ..              | ..     | ..   | ..    | ..    | ..      | ..         | ..       | ..        | ..        | 1                 | ..        | ..     | 1      | ..      |
| <i>Infectious Disease.</i>    |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Dysentery (bacillary) ..      | 5      | 14   | 25    | 12    | 3       | 2          | 1        | 1         | 3         | 1                 | ..        | ..     | 67     | 3**     |
| Influenza ..                  | ..     | 1    | 1     | ..    | ..      | ..         | 1        | ..        | ..        | ..                | ..        | ..     | 3      | ..      |
| Rheumatic fever ..            | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| Enteric fever ..              | ..     | 1    | 1     | 1     | ..      | ..         | ..       | ..        | 1         | ..                | ..        | ..     | 4      | ..      |
| Elephantoid fever ..          | ..     | 1    | ..    | ..    | ..      | ..         | ..       | ..        | ..        | ..                | ..        | ..     | 1      | ..      |
| <i>Parasites.</i>             |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Ascariasis ..                 | 3      | ..   | ..    | ..    | 1       | ..         | ..       | ..        | ..        | ..                | ..        | 2      | 6      | ..      |
| <i>General.</i>               |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| P.U.O. and no notes ..        | ..     | ..   | ..    | ..    | 1††     | ..         | 1        | ..        | ..        | ..                | ..        | ..     | 2      | ..      |
| <i>Tumours.</i>               |        |      |       |       |         |            |          |           |           |                   |           |        |        |         |
| Carcinomata ..                | ..     | ..   | ..    | ..    | ..      | ..         | ..       | 1         | 1         | ..                | ..        | ..     | 2      | ..      |
| Totals ..                     | 11     | 31   | 31    | 17    | 9       | 10         | 16       | 7         | 11        | 17                | 10        | 14     | 184    | 5       |

\* Operations on adults.  
 § Both B.C.C. infections.  
 spread and proved fatal.  
 no notes made.

† Associated with pregnancy.

¶ Extensive burns of limbs and face and body.

† Both cases suffering from puerperal sepsis before admission.  
 ¶ Large carbuncle of neck twice excised, but gradually

\*\* All in young children under three years of age.

†† Case was taken home same day;

## APIA HOSPITAL.—CLASSIFIED ADMISSIONS TO THE SAMOAN WARDS, 1923-24.

|                                    | 1923.  |      |       |       |      |       |      |      |      |      | 1924. |        |    | Total. | Deaths. |
|------------------------------------|--------|------|-------|-------|------|-------|------|------|------|------|-------|--------|----|--------|---------|
|                                    | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb.  | March. |    |        |         |
| Alimentary System.                 |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Ascites .. ..                      | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | 1      | ..      |
| Colic .. ..                        | ..     | ..   | 1     | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 3  | ..     | ..      |
| Colitis .. ..                      | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1  | ..     | ..      |
| Constipation .. ..                 | 1      | 1    | ..    | 1     | 2    | 1     | 1    | ..   | 1    | 1    | ..    | 1      | 10 | ..     | ..      |
| Diarrhoea .. ..                    | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | 1      | 3  | ..     | ..      |
| Gastro-enteritis .. ..             | 3      | 4    | 5     | 7     | 5    | 2     | 6    | 5    | 1    | 4    | 2     | 6      | 50 | 6      | ..      |
| Gingivitis .. ..                   | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 2  | ..     | ..      |
| Hare lip .. ..                     | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | 1    | ..    | ..     | 2  | ..     | ..      |
| Hernia .. ..                       | ..     | 1    | 1     | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 3  | ..     | ..      |
| Hepatitis .. ..                    | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Hisschsprung's disease .. ..       | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | 1      | ..      |
| Marasmus .. ..                     | ..     | 1    | 2     | 1     | ..   | ..    | 1    | 1    | ..   | 1    | 1     | 1      | 9  | ..     | ..      |
| Obstruction .. ..                  | ..     | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 1  | 1      | ..      |
| Peritonitis .. ..                  | ..     | 2    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2  | 1*     | ..      |
| Respiratory System.                |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Asthma .. ..                       | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Bronchiectasis .. ..               | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Croup .. ..                        | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Bronchitis .. ..                   | 1      | 1    | ..    | ..    | 1    | 1     | ..   | 3    | 1    | 1    | 1     | 1      | 11 | ..     | ..      |
| Phthisis .. ..                     | 3      | 2    | ..    | ..    | ..   | 2     | 1    | ..   | ..   | 1    | 2     | ..     | 11 | ..     | ..      |
| Pleurisy .. ..                     | ..     | 1    | ..    | ..    | 1    | ..    | ..   | 1    | 2    | ..   | 1     | 1      | 7  | ..     | ..      |
| Pneumonia .. ..                    | 1      | 1    | 7     | 2     | 3    | 5     | 16   | 9    | 7    | 6    | 9     | 7      | 73 | 11†    | ..      |
| Trachitis .. ..                    | 1      | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | 1     | ..     | 3  | ..     | ..      |
| Circulatory System.                |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Adenitis .. ..                     | 1      | 4    | ..    | 1     | ..   | ..    | ..   | 1    | ..   | ..   | ..    | 3      | 10 | ..     | ..      |
| Anæmia .. ..                       | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Cardiac .. ..                      | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | ..     | 1  | ..     | ..      |
| Chyluria .. ..                     | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | ..     | 1  | ..     | ..      |
| Lymphangitis .. ..                 | ..     | ..   | 2     | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | 1      | 4  | ..     | ..      |
| Genito-urinary System.             |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Abortion .. ..                     | 1      | ..   | 1     | ..    | ..   | ..    | ..   | 1    | ..   | 1    | ..    | ..     | 4  | ..     | ..      |
| Balanitis .. ..                    | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | .. | ..     | ..      |
| Circumcision .. ..                 | ..     | ..   | ..    | ..    | 1    | 1     | ..   | ..   | ..   | 1    | 2     | ..     | 5  | ..     | ..      |
| Confinement .. ..                  | ..     | ..   | ..    | ..    | ..   | ..    | ..   | 2    | 2    | ..   | ..    | ..     | 4  | ..     | ..      |
| Cystitis .. ..                     | ..     | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | 2    | ..    | ..     | 3  | ..     | ..      |
| Hydrocele radical cure .. ..       | 1      | 2    | 2     | 2     | 3    | 2     | 1    | 3    | 4    | 1    | 1     | ..     | 22 | ..     | ..      |
| Hyperemesis gravidarum .. ..       | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Menorrhagia .. ..                  | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1  | ..     | ..      |
| Nephritis .. ..                    | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Ovarian cyst .. ..                 | ..     | ..   | ..    | ..    | 1    | ..    | ..   | 2    | ..   | ..   | 1     | ..     | 4  | ..     | ..      |
| Prolapse of uterus .. ..           | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Pyelitis .. ..                     | ..     | ..   | 2     | ..    | ..   | ..    | 1    | ..   | 2    | ..   | ..    | ..     | 5  | ..     | ..      |
| Subinvolution .. ..                | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | .. | ..     | ..      |
| Vræmia .. ..                       | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | .. | ..     | ..      |
| Skin and Subcutaneous Tissues.     |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Cuts, wounds, &c. .. ..            | ..     | ..   | 1     | ..    | ..   | 3     | ..   | 6    | 2    | 3    | 1     | 3      | 19 | ..     | ..      |
| Burns .. ..                        | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | 2     | ..     | 3  | ..     | ..      |
| Dermatitis .. ..                   | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | 1      | 3  | ..     | ..      |
| Elephantoid fever .. ..            | 3      | 3    | ..    | ..    | ..   | ..    | 1    | ..   | 1    | 3    | ..    | 3      | 14 | ..     | ..      |
| Elephantoid scrotum .. ..          | 1      | ..   | 3     | ..    | ..   | ..    | 3    | 2    | 6    | 2    | 7     | 5      | 29 | ..     | ..      |
| Elephantoid tissue (general) .. .. | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Ulcer .. ..                        | 2      | ..   | 1     | 1     | ..   | ..    | 1    | ..   | ..   | ..   | ..    | 1      | 6  | ..     | ..      |
| Cellulitis .. ..                   | 2      | 3    | ..    | 2     | 3    | 1     | 1    | ..   | ..   | ..   | 1     | 1      | 14 | ..     | ..      |
| Nervous System.                    |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Concussion .. ..                   | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | .. | ..     | ..      |
| Hemiplegia .. ..                   | ..     | ..   | ..    | ..    | 2    | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 3  | ..     | ..      |
| Neuralgia .. ..                    | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | 1     | ..     | 2  | ..     | ..      |
| Supporting Structures.             |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Abscess .. ..                      | 9      | 2    | 2     | 4     | 10   | 8     | 6    | 8    | 4    | 8    | 6     | 7      | 74 | 3†     | ..      |
| Bone necrosis .. ..                | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1  | ..     | ..      |
| Fractures .. ..                    | ..     | 1    | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | 1      | 3  | ..     | ..      |
| Ganglion .. ..                     | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Injuries, sprains, &c. .. ..       | 2      | 2    | 1     | 2     | 1    | 1     | 1    | ..   | 2    | 3    | 3     | 2      | 20 | ..     | ..      |
| Rheumatism .. ..                   | ..     | ..   | 1     | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | 1      | 3  | ..     | ..      |
| Talepes equino varus .. ..         | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Acute Infections.                  |        |      |       |       |      |       |      |      |      |      |       |        |    |        |         |
| Chicken-pox .. ..                  | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1  | ..     | ..      |
| Dysentery (baccillary) .. ..       | 5      | 23   | 32    | 23    | 8    | 4     | 1    | 2    | 1    | ..   | ..    | ..     | 99 | 3      | ..      |
| Enteric fever .. ..                | 2      | 2    | ..    | 2     | ..   | ..    | 2    | ..   | 5    | ..   | 1     | 2      | 16 | ..     | ..      |
| Influenza .. ..                    | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 2  | ..     | ..      |
| Malaria .. ..                      | ..     | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Measles .. ..                      | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1  | ..     | ..      |
| P.U.O. .. ..                       | ..     | ..   | ..    | ..    | 3    | 3     | 1    | ..   | ..   | ..   | ..    | 1      | 8  | ..     | ..      |
| Puerperal fever .. ..              | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | ..    | 2      | 4  | ..     | ..      |
| Rheumatic fever .. ..              | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1  | ..     | ..      |
| Septicæmia and pyæmia .. ..        | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | 1    | ..    | ..     | 2  | ..     | ..      |
| Tetanus .. ..                      | 1      | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | 1     | ..     | 3  | 2      | ..      |
| Yaws .. ..                         | 2      | 1    | ..    | ..    | 1    | 2     | ..   | ..   | ..   | ..   | 1     | ..     | 7  | ..     | ..      |

CLASSIFIED ADMISSION TO THE SAMOAN WARDS, 1923-24—*continued*.

| —                            | 1923.  |      |       |       |      |       |      |      |      |      | 1924. |        |     | Total. | Deaths. |
|------------------------------|--------|------|-------|-------|------|-------|------|------|------|------|-------|--------|-----|--------|---------|
|                              | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb.  | March. |     |        |         |
| <i>Special-sense Organs.</i> |        |      |       |       |      |       |      |      |      |      |       |        |     |        |         |
| Blipharitis .. ..            | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1   | ..     |         |
| Conjunctivitis .. ..         | 2      | 2    | 5     | ..    | 1    | ..    | 1    | ..   | 1    | ..   | 1     | ..     | 13  | ..     |         |
| Corneal ulcer .. ..          | ..     | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..    | 1      | 2   | ..     |         |
| Nasal polypi .. ..           | ..     | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..    | ..     | 1   | ..     |         |
| Panaphthalmitis .. ..        | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1   | ..     |         |
| Staphyloma .. ..             | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 2   | ..     |         |
| <i>Parasites.</i>            |        |      |       |       |      |       |      |      |      |      |       |        |     |        |         |
| Ascariasis .. ..             | ..     | ..   | ..    | ..    | ..   | 1     | 1    | ..   | 1    | ..   | 1     | ..     | 4   | ..     |         |
| Hookworm .. ..               | 1      | ..   | 1     | ..    | 2    | 1     | 1    | ..   | ..   | ..   | ..    | 1      | 7   | ..     |         |
| <i>General.</i>              |        |      |       |       |      |       |      |      |      |      |       |        |     |        |         |
| Observation cases ..         | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1   | ..     |         |
| Poisoning drugs .. ..        | ..     | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1   | ..     |         |
| Poisoning food .. ..         | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 3    | 1    | ..    | ..     | 4   | ..     |         |
| Tumours .. ..                | ..     | ..   | ..    | ..    | 2    | ..    | 1    | 1    | 1    | ..   | 2     | ..     | 7   | ..     |         |
| Unclassified .. ..           | ..     | 1    | 1     | 1     | ..   | 2     | 3    | 1    | 2    | ..   | ..    | ..     | 11  | ..     |         |
| Monthly totals ..            | 50     | 64   | 79    | 52    | 55   | 41    | 57   | 51   | 57   | 43   | 53    | 60     | 662 | 29     |         |

\* Tubercular peritonitis.

† Practically all in children under three.

‡ Abscess of thyroid and two deep illiac.

## APIA HOSPITAL.—INDENTURED-LABOURERS WARDS: MEDICAL RECORDS, 1923-24.

*Chinese In-patients under Treatment during the Hospital Year 1923-24.*

|                                        | Remaining in Hospital on 31/3/23. | Admissions during 1923-24. |      |       |       |      |       |      |      |      |      |       |        | Total. | Deaths. |
|----------------------------------------|-----------------------------------|----------------------------|------|-------|-------|------|-------|------|------|------|------|-------|--------|--------|---------|
|                                        |                                   | 1923.                      |      |       |       |      |       |      |      |      |      | 1924. |        |        |         |
|                                        |                                   | April.                     | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb.  | March. |        |         |
| <i>Alimentary System.</i>              |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Ankylstomiasis ..                      | 1                                 | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Constipation ..                        | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | ..    | ..     | 1      | ..      |
| Diarrhoea ..                           | ..                                | 1                          | ..   | 1     | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 3      | ..      |
| Dysentery ..                           | 2                                 | 3                          | 5    | 5     | 8     | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 24     | ..      |
| Enteric fever ..                       | ..                                | ..                         | ..   | 4     | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 5      | ..      |
| Gastritis ..                           | ..                                | ..                         | ..   | ..    | 1     | ..   | ..    | ..   | 1    | ..   | ..   | ..    | ..     | 2      | ..      |
| Hepatitis ..                           | ..                                | ..                         | ..   | ..    | 1     | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..     | 2      | ..      |
| Jaundice ..                            | ..                                | ..                         | ..   | 1     | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2      | ..      |
| Stomatitis ..                          | ..                                | ..                         | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| <i>Respiratory System.</i>             |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Asthma ..                              | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1      | ..      |
| Bronchitis ..                          | ..                                | ..                         | 1    | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 2      | ..      |
| Hæmoptysis ..                          | ..                                | ..                         | ..   | ..    | 1     | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 2      | ..      |
| Laryngitis ..                          | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Phthisis ..                            | 1                                 | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | ..    | ..     | 2      | ..      |
| <i>Vascular System.</i>                |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Cardiac ..                             | ..                                | ..                         | ..   | 1     | ..    | 1    | 1     | ..   | ..   | ..   | ..   | 1     | ..     | 4      | ..      |
| Lymphangitis ..                        | ..                                | ..                         | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| <i>Genito-urinary System.</i>          |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Balanitis ..                           | 1                                 | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Cystitis ..                            | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..    | ..     | 1      | ..      |
| Hæmaturia ..                           | ..                                | ..                         | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Hydrocele ..                           | ..                                | ..                         | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Retention of urine ..                  | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 2      | ..      |
| <i>Nervous System.</i>                 |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Concussion ..                          | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Headache ..                            | ..                                | ..                         | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| <i>Skin and Supporting Structures.</i> |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Abscess ..                             | 1                                 | ..                         | ..   | ..    | 1     | ..   | ..    | ..   | ..   | 1    | 1    | ..    | ..     | 4      | 1       |
| Acute dermatitis ..                    | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1      | ..      |
| Carbuncles ..                          | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Cellulitis ..                          | ..                                | ..                         | 2    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | 1      | 4      | ..      |
| Fractures ..                           | 1                                 | ..                         | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | 1    | ..    | ..     | 3      | ..      |
| Pemphigens ..                          | ..                                | ..                         | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Septic sores ..                        | ..                                | 1                          | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | 3    | ..    | 9      | 14     | ..      |
| Wounds, cuts ..                        | ..                                | ..                         | 1    | 2     | ..    | 2    | 2     | 3    | ..   | 2    | 1    | 2     | 2      | 17     | 1       |
| <i>Special Senses.</i>                 |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Conjunctivitis ..                      | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | 2      | 3      | ..      |
| <i>General Infections.</i>             |                                   |                            |      |       |       |      |       |      |      |      |      |       |        |        |         |
| Beriberi ..                            | 6                                 | ..                         | 4    | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 11     | ..      |
| Influenza and fever ..                 | 3                                 | 1                          | ..   | ..    | ..    | 2    | 1     | ..   | ..   | ..   | ..   | ..    | 1      | 8      | ..      |
| Leprosy ..                             | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | 1    | ..   | 1    | ..   | ..    | ..     | 2      | ..      |
| Malaria ..                             | 1                                 | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      | ..      |
| Rheumatism ..                          | ..                                | ..                         | ..   | ..    | 1     | 1    | ..    | ..   | 1    | 2    | ..   | ..    | ..     | 5      | ..      |
| Yaws ..                                | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1      | ..      |
| Poisoning ..                           | ..                                | ..                         | 1    | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2      | ..      |
| Malingering ..                         | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | ..     | 1      | ..      |
| Totals ..                              | 17                                | 9                          | 14   | 16    | 18    | 9    | 7     | 8    | 3    | 9    | 8    | 5     | 18     | 141    | 3       |

*Melanesian Labourers admitted to Hospital in Year 1923-24.*

| Disease.          | Number of Cases. | Disease.             | Number of Cases. |
|-------------------|------------------|----------------------|------------------|
| Abscesses .. .. . | 9                | Injury .. .. .       | 2                |
| Dysentery .. .. . | 5                | Paraphimosis .. .. . | 2                |
| Fractures .. .. . | 1                | Pneumonia .. .. .    | 5*               |
| Gonorrhœa .. .. . | 1                | Totals .. .. .       | 25               |

\* One death—died the night of admission.

The totals of patients receiving treatment were as follows :—

|                                                   |    |    |    |     |
|---------------------------------------------------|----|----|----|-----|
| Chinese remaining in hospital on 31st March, 1923 | .. | .. | .. | 17  |
| Chinese admissions during 1923-24                 | .. | .. | .. | 124 |
| Melanesians remaining in hospital                 | .. | .. | .. | 0   |
| Melanesian admissions during 1923-24              | .. | .. | .. | 25  |
| Total                                             | .. | .. | .. | 166 |

Three Chinese and one Melanesian died in the wards during the year.

## APIA HOSPITAL.—SURGICAL OPERATIONS PERFORMED UNDER GENERAL ANÆSTHESIA DURING YEAR 1923-24.

| Surgical Operations.                                      | 1923.  |      |       |       |      |       |      |      |      |      | 1924. |      |     | Total. |
|-----------------------------------------------------------|--------|------|-------|-------|------|-------|------|------|------|------|-------|------|-----|--------|
|                                                           | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb.  | Mar. |     |        |
| On skin and cellular tissues—                             |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Abscess .. .. .                                           | 6      | 7    | 5     | 5     | 12   | 7     | 6    | 11   | 10   | 15   | 6     | 4    | 94  |        |
| Cellulitis .. .. .                                        | 1      | 1    | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..   | 3   |        |
| Foreign bodies .. .. .                                    | ..     | ..   | 1     | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..    | ..   | 2   |        |
| Hare lip .. .. .                                          | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 2    | 1    | ..    | ..   | 3   |        |
| Plastic .. .. .                                           | ..     | ..   | ..    | ..    | 1    | 1     | ..   | 2    | 1    | 3    | 1     | 1    | 10  |        |
| Sebaceous cysts .. .. .                                   | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | 1    | 2   |        |
| Sinuses .. .. .                                           | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..   | 2   |        |
| Wounds, sutured .. .. .                                   | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 2    | 2   |        |
| On joints—                                                |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Arthrotomy .. .. .                                        | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Ganglion .. .. .                                          | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | 1    | 1   |        |
| Tendon sutures .. .. .                                    | ..     | ..   | ..    | 1     | ..   | 1     | ..   | ..   | ..   | ..   | 1     | ..   | 3   |        |
| On bones—                                                 |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Amputations .. .. .                                       | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | 1    | ..   | 1     | ..   | 3   |        |
| Fractures .. .. .                                         | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Sequestrotomy .. .. .                                     | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | 1    | 1    | ..    | ..   | 3   |        |
| On the eye—                                               |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Evisceration .. .. .                                      | ..     | 1    | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1    | 3   |        |
| Paracentesis oculi .. .. .                                | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1    | 1   |        |
| On ear, nose, and throat—                                 |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Antrum drainage .. .. .                                   | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Dental extractions .. .. .                                | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Tonsils and adenoids .. .. .                              | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | 1    | 2   |        |
| On the abdomen—                                           |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Appendicectomy .. .. .                                    | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Laparotomy .. .. .                                        | ..     | ..   | ..    | 1     | ..   | ..    | ..   | 1    | 1    | ..   | 1     | ..   | 4   |        |
| Radical cure hernia .. .. .                               | ..     | 1    | 1     | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..   | 3   |        |
| Penetration wounds .. .. .                                | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| On male organs—                                           |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Castration .. .. .                                        | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Circumcision .. .. .                                      | ..     | ..   | 1     | ..    | 1    | ..    | 1    | ..   | ..   | 1    | 3     | ..   | 7   |        |
| Hydrocele radical cure .. .. .                            | 1      | 2    | 2     | 1     | 2    | 1     | 1    | 1    | 2    | 1    | ..    | ..   | 14  |        |
| Prostatectomy .. .. .                                     | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1    | 1   |        |
| Vasectomy .. .. .                                         | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| On female organs—                                         |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Curettagé .. .. .                                         | ..     | 1    | ..    | ..    | 1    | 2     | ..   | 1    | 1    | 1    | ..    | 1    | 8   |        |
| Difficult labour .. .. .                                  | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..   | 1   |        |
| Ovarian cyst .. .. .                                      | ..     | ..   | ..    | ..    | ..   | 1     | ..   | 1    | ..   | ..   | ..    | ..   | 2   |        |
| Ruptured ectopic .. .. .                                  | ..     | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| On tumours—                                               |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Branchial cyst .. .. .                                    | ..     | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Carcinoma in breast .. .. .                               | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..   | 1   |        |
| Lipomata .. .. .                                          | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Dermoid cyst (ovarian) .. .. .                            | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..   | 1   |        |
| Parotid tumour .. .. .                                    | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Lymphatic system—                                         |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Amputation of elephantoid serotum .. .. .                 | ..     | ..   | 2     | ..    | 1    | ..    | 2    | 2    | 6    | 2    | 7     | 4    | 26  |        |
| Amputation of elephantoid tissue .. .. .                  | ..     | ..   | 1     | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..    | ..   | 2   |        |
| Excision of glands .. .. .                                | 1      | 1    | 2     | ..    | ..   | ..    | ..   | 1    | 1    | ..   | ..    | 1    | 7   |        |
| Chest—                                                    |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Empyema .. .. .                                           | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Deformities—                                              |        |      |       |       |      |       |      |      |      |      |       |      |     |        |
| Talipes equino varus .. .. .                              | ..     | 1    | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..   | 1   |        |
| Total .. .. .                                             | 10     | 17   | 16    | 10    | 24   | 20    | 12   | 22   | 31   | 25   | 21    | 17   | 225 |        |
| Minor surgical operations, usually under local anæsthesia | 17     | 21   | 25    | 16    | 17   | 31    | 14   | 19   | 18   | 34   | 19    | 39   | 270 |        |

## CLINICAL DIVISION.—ATTENDANCE, OPERATIONS, ETC., FOR THE YEAR 1922-23.

| <i>Apia Hospital.</i>                 |       |                             |       | <i>Tuasivi Hospital.</i> |  |  |  |
|---------------------------------------|-------|-----------------------------|-------|--------------------------|--|--|--|
| General attendance .. .. .            | 5,093 | Attendance .. .. .          | 1,509 |                          |  |  |  |
| European in-patients .. .. .          | 196   | Samoan in-patients .. .. .  | 231   |                          |  |  |  |
| Samoan in-patients .. .. .            | 569   | Samoan out-patients .. .. . | 922   |                          |  |  |  |
| Chinese in-patients—                  |       | Operations .. .. .          | 45    |                          |  |  |  |
| Apia Hospital, 385; C. E. Hospital,   |       |                             |       |                          |  |  |  |
| 184 .. .. .                           | 569   |                             |       |                          |  |  |  |
| Chinese out-patients—                 |       |                             |       |                          |  |  |  |
| Apia Hospital, 3,379; C. E. Hospital, |       |                             |       |                          |  |  |  |
| 1,125 .. .. .                         | 4,504 |                             |       |                          |  |  |  |
| Operations* .. .. .                   | 144   |                             |       |                          |  |  |  |

\* Under the heading of "Operations" at the Apia Hospital are included under major operations, requiring a general anæsthetic. The records of minor operations are incomplete, but would average about 25 per month.

## APIA HOSPITAL.—CLASSIFIED TABLE OF ADMISSIONS FOR THE YEAR 1922-23.

|                                               | 1922.  |      |       |       |      |       |      |      |      |      | 1923. |        |        |  |
|-----------------------------------------------|--------|------|-------|-------|------|-------|------|------|------|------|-------|--------|--------|--|
|                                               | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb.  | March. | Total. |  |
| <i>Alimentary System—</i>                     |        |      |       |       |      |       |      |      |      |      |       |        |        |  |
| Gastro-enteritis ..                           | 9      | 4    | 4     | 3     | 8    | 5     | 3    | 1    | 11   | 10   | 12    | 3      | 73     |  |
| Marasmus ..                                   | 1      | 1    | 1     | ..    | ..   | 1     | 2    | ..   | 2    | 1    | 1     | ..     | 10     |  |
| Catarrhal jaundice ..                         | ..     | ..   | ..    | ..    | ..   | ..    | 1    | 1    | ..   | ..   | ..    | ..     | 2      |  |
| Hepatitis ..                                  | ..     | ..   | 2     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2      |  |
| Intussusception ..                            | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1*     |  |
| Intestinal obstruction                        | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      |  |
| Hernia, inguinal ..                           | 1      | ..   | ..    | ..    | ..   | 1     | ..   | ..   | 1    | ..   | ..    | ..     | 3†     |  |
| Imperforate anus ..                           | ..     | ..   | 1     | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2‡     |  |
| Cleft palate ..                               | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1      |  |
| Ascites ..                                    | 1      | 1    | ..    | ..    | 1    | 1     | ..   | ..   | ..   | ..   | ..    | ..     | 4§     |  |
| <i>Respiratory System—</i>                    |        |      |       |       |      |       |      |      |      |      |       |        |        |  |
| Lobar pneumonia ..                            | 1      | 3    | 7     | 11    | 3    | 1     | ..   | 6    | 3    | 4    | 7     | 1      | 47     |  |
| Bronchitis and<br>Broncho - pneumo-<br>nia .. | 2      | ..   | 1     | 1     | ..   | ..    | 2    | 1    | 4    | 17   | 11    | 4      | 43     |  |
| Pleurisy ..                                   | ..     | 1    | ..    | 1     | 1    | 1     | ..   | ..   | ..   | 1    | 2     | 1      | 8      |  |
| Phthisis ..                                   | ..     | ..   | 2     | 2     | 3    | 1     | ..   | 3    | 2    | 1    | ..    | ..     | 14     |  |
| Asthma ..                                     | ..     | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | 1    | ..    | ..     | 2      |  |
| Empyema ..                                    | ..     | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1      |  |
| Adenoids ..                                   | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1      |  |
| Circulatory system ..                         | ..     | 1    | 1     | ..    | ..   | ..    | 1    | 1    | ..   | ..   | ..    | ..     | 4¶     |  |

\* Adult, three days' duration; resection of bowel; died. † One case strangulated; three day's duration; resection; died.  
‡ One case showed transposition of the viscera. § One case operated on for T.B; others probably T.B. || All of the dry type.  
¶ Two cases of endocarditis, two doubtful; died soon after admission.

## CAUSES OF DEATHS OCCURRING IN THE EUROPEAN AND SAMOAN HOSPITALS DURING THE YEAR 1922-23.

| Disease.                                | Deaths. | Remarks.                                                                                                                                                                                                                                           |
|-----------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cancer of stomach .. .. .               | 1       | European.                                                                                                                                                                                                                                          |
| Uræmia .. .. .                          | 1       | European.                                                                                                                                                                                                                                          |
| Placenta prævia .. .. .                 | 1       | Half-caste Samoan; delivered at home; admitted in a critical condition; died of sepsis.                                                                                                                                                            |
| Cardiac .. .. .                         | 1       | European: arterio-sclerosis and chronic nephritis.                                                                                                                                                                                                 |
| Fractured skull .. .. .                 | 1       | Half-caste male: admitted unconscious; died same day.                                                                                                                                                                                              |
| Gastro-enteritis .. .. .                | 1       | Half-caste child; died day of admission.                                                                                                                                                                                                           |
| Bacillary dysentery and lobar pneumonia | 1       | European child: developed lobar pneumonia when convalescing from dysentery.                                                                                                                                                                        |
| <b>SAMOAN HOSPITAL.</b>                 |         |                                                                                                                                                                                                                                                    |
| Bacillary dysentery .. .. .             | 2       |                                                                                                                                                                                                                                                    |
| Gastro-enteritis .. .. .                | 5       |                                                                                                                                                                                                                                                    |
| Marasmus .. .. .                        | 1       |                                                                                                                                                                                                                                                    |
| Tetanus .. .. .                         | 2       |                                                                                                                                                                                                                                                    |
| Ovarian cyst .. .. .                    | 1       | Died from post-operative shock.                                                                                                                                                                                                                    |
| Strangulated hernia .. .. .             | 1       | Three days' duration; resection of bowel; artificial anus.                                                                                                                                                                                         |
| Intussusception .. .. .                 | 1       | Three days' duration; resection of bowel; end-to-end anastomosis.                                                                                                                                                                                  |
| Imperforate anus .. .. .                | 2       |                                                                                                                                                                                                                                                    |
| Uræmia .. .. .                          | 1       | Female; admitted in comatose condition.                                                                                                                                                                                                            |
| Phthisis pulmonalis .. .. .             | 1       |                                                                                                                                                                                                                                                    |
| Encephalitis lethargica .. .. .         | 1       |                                                                                                                                                                                                                                                    |
| Arthritis, knee .. .. .                 | 1       | Secondary hæmorrhage; amputation; death from post-operative shock.                                                                                                                                                                                 |
| Amputation of arm .. .. .               | 1       | Compound-fracture dislocation; one week; forearm gangrenous; death from shock and sepsis.                                                                                                                                                          |
| No diagnosis .. .. .                    | 6       | Admitted in a moribund condition. In some instances there was evidence that Native medicine had been given. In at least one case this was admitted. The drug used appears to have caused rapid heart-failure, death ensuing in about twelve hours. |

|                                 | 1922.  |      |       |       |      |       |      |      |      |      | 1923. |        |     | Total. |
|---------------------------------|--------|------|-------|-------|------|-------|------|------|------|------|-------|--------|-----|--------|
|                                 | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb.  | March. |     |        |
| Anæmia .. .. .                  | ..     | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..    | ..     | 1   |        |
| <i>Genito-urinary System.</i>   |        |      |       |       |      |       |      |      |      |      |       |        |     |        |
| Pyelitis .. .. .                | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..    | ..     | 1   |        |
| Cystitis .. .. .                | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 2      | 3   |        |
| Balanitis .. .. .               | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1     | ..     | 2   |        |
| Hydrocele .. .. .               | ..     | 1    | ..    | 1     | 1    | 1     | ..   | ..   | 1    | 1    | 1     | ..     | 7   |        |
| Ovarian cyst .. .. .            | ..     | ..   | ..    | ..    | ..   | 1     | 1    | ..   | ..   | ..   | ..    | ..     | 2   |        |
| Subinvolution .. .. .           | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | 1      | 1   |        |
| Puerperal fever .. .. .         | ..     | 1    | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | 1     | ..     | 3   |        |
| Miscarriage .. .. .             | ..     | 1    | 1     | 1     | ..   | ..    | ..   | 1    | ..   | 1    | ..    | ..     | 5   |        |
| Confinement .. .. .             | ..     | 1    | ..    | ..    | ..   | 1     | ..   | 1    | ..   | ..   | 1     | ..     | 4   |        |
| <i>Lymphatic System.</i>        |        |      |       |       |      |       |      |      |      |      |       |        |     |        |
| Filariasis .. .. .              | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | ..  |        |
| Mumu* .. .. .                   | 2      | ..   | ..    | 1     | 1    | 4     | ..   | 1    | 2    | ..   | 1     | ..     | 12* |        |
| Elephantiasis .. .. .           | 1      | 5    | 2     | 1     | 2    | 1     | ..   | 1    | 1    | 1    | 4     | 1      | 20  |        |
| Abscess .. .. .                 | ..     | 2    | 1     | 2     | 2    | 3     | 5    | 3    | 2    | 5    | 3     | 9      | 37† |        |
| Adenitis .. .. .                | ..     | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1   |        |
| <i>Special Senses.</i>          |        |      |       |       |      |       |      |      |      |      |       |        |     |        |
| Conjunctivitis .. .. .          | ..     | 2    | 1     | 2     | ..   | ..    | ..   | 1    | ..   | ..   | 1     | 3      | 10  |        |
| Otitis media .. .. .            | ..     | ..   | ..    | 1     | ..   | ..    | ..   | ..   | 2    | 1    | ..    | ..     | 4   |        |
| Mastoiditis .. .. .             | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1‡  |        |
| Hemiplegia .. .. .              | ..     | ..   | ..    | 1     | 1    | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2§  |        |
| Acute infections .. .. .        | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | ..  |        |
| Typhoid fever .. .. .           | ..     | 2    | 2     | ..    | 1    | ..    | ..   | ..   | ..   | 2    | 1     | 1      | 9   |        |
| Bacillary dysentery .. .. .     | ..     | ..   | ..    | ..    | ..   | ..    | ..   | 5    | 3    | 9    | 2     | 7      | 26  |        |
| Influenza .. .. .               | 3      | ..   | ..    | ..    | 3    | 2     | ..   | ..   | 2    | ..   | 1     | 1      | 12  |        |
| Mumps .. .. .                   | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 2     | ..     | 2   |        |
| Measles .. .. .                 | ..     | ..   | ..    | ..    | ..   | ..    | 5    | ..   | ..   | ..   | ..    | ..     | 5   |        |
| Chorea .. .. .                  | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1   |        |
| Encephalitis lethargica .. .. . | 1      | 1    | ..    | 1     | 1    | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 5   |        |
| Tetanus .. .. .                 | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 2    | ..    | ..     | 2   |        |
| <i>General.</i>                 |        |      |       |       |      |       |      |      |      |      |       |        |     |        |
| Periostitis .. .. .             | ..     | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1   |        |
| Arthritis .. .. .               | ..     | 1    | 1     | ..    | ..   | 1     | 2    | ..   | ..   | 2    | ..    | 1      | 8   |        |
| Ganglion (knee) .. .. .         | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | 1     | ..     | 2   |        |
| Rheumatism .. .. .              | ..     | ..   | ..    | ..    | 2    | ..    | 1    | ..   | 2    | ..   | 1     | ..     | 6   |        |
| Nelminthiasis .. .. .           | 7      | 6    | 7     | 5     | 7    | 2     | 3    | 1    | 3    | 6    | 6     | 3      | 57  |        |
| Septic sores .. .. .            | 6      | 4    | 4     | 2     | ..   | 1     | 1    | 2    | 1    | ..   | 3     | 2      | 26  |        |
| Goitre .. .. .                  | ..     | ..   | 2     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2   |        |
| <i>Accidents.</i>               |        |      |       |       |      |       |      |      |      |      |       |        |     |        |
| Concussion .. .. .              | 1      | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 1   |        |
| Cuts, &c. . . . .               | 1      | 2    | 1     | 2     | 3    | 1     | 2    | 3    | 2    | 1    | ..    | ..     | 18  |        |
| Burns .. .. .                   | 1      | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..    | ..     | 2   |        |
| Gunshot wounds .. .. .          | ..     | ..   | ..    | ..    | ..   | ..    | 1    | ..   | 1    | ..   | ..    | ..     | 2   |        |
| Fractures .. .. .               | ..     | 1    | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 2   |        |
| Poisoning .. .. .               | 1      | ..   | ..    | ..    | ..   | ..    | 1    | ..   | ..   | ..   | ..    | ..     | 2   |        |
| Alcoholism, acute .. .. .       | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | ..    | ..     | 1   |        |
| Leprosy .. .. .                 | ..     | 2    | 1     | 4     | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 7¶  |        |
| Unclassified .. .. .            | ..     | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..    | ..     | 36  |        |

\* Local name for elephantoid fever. † Included here because most are filarial in origin.  
 male, 66 years: sudden onset; arteriosclerosis. One male, 48 years: gradual onset; etiology.

‡ Following measles. § One  
 ¶ Half-caste Chinese-Samoan youth.

‡ Concentrated at the hospital whilst awaiting transfer to Fiji; transferred August, 1922.

## APIA HOSPITAL.—INDENTURED-LABOURERS WARDS: MEDICAL RECORDS, 1922-23.

## Chinese In-patients under Treatment during the Hospital Year 1922-23.

|                               | Remaining in Hospital on 31/3/22. | Admissions during 1922-23. |      |       |       |      |       |      |      |      |      |      |        |     | Total. |
|-------------------------------|-----------------------------------|----------------------------|------|-------|-------|------|-------|------|------|------|------|------|--------|-----|--------|
|                               |                                   | April.                     | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March. |     |        |
| <i>Alimentary System.</i>     |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Ankylstomiasis .. ..          | 1                                 | 8                          | 10   | 5     | 3     | 1    | 1     | 3    | ..   | ..   | 2    | ..   | ..     | 34  |        |
| Cholelithiasis .. ..          | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Colic .. ..                   | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..   | ..     | 1   |        |
| Constipation .. ..            | ..                                | ..                         | 1    | 1     | 1     | 2    | 2     | ..   | ..   | ..   | ..   | ..   | ..     | 7   |        |
| Dental caries .. ..           | ..                                | ..                         | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Diarrhoea .. ..               | ..                                | 3                          | ..   | ..    | 2     | ..   | 6     | 1    | 3    | ..   | 1    | ..   | ..     | 15  |        |
| Dysentery .. ..               | ..                                | ..                         | ..   | 1     | ..    | ..   | 2     | 1    | ..   | 2    | 3    | 2    | 3      | 14  |        |
| Enteric fever .. ..           | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | 1    | 1    | ..     | 2   |        |
| Gastritis .. ..               | 1                                 | ..                         | ..   | ..    | 1     | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 2   |        |
| Jaundice .. ..                | ..                                | ..                         | 1    | ..    | ..    | ..   | 2     | ..   | 1    | ..   | ..   | 1    | ..     | 5   |        |
| <i>Respiratory System.</i>    |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Asthma .. ..                  | ..                                | 1                          | 1    | ..    | 1     | 1    | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 4   |        |
| Bronchitis .. ..              | ..                                | 2                          | ..   | 1     | ..    | ..   | 2     | ..   | 1    | ..   | 1    | ..   | ..     | 7   |        |
| Broncho-pneumonia .. ..       | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | 1    | ..     | 1   |        |
| Larangitis .. ..              | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | ..  |        |
| Pharangitis and coryza .. ..  | ..                                | ..                         | ..   | ..    | 4     | ..   | 1     | 2    | 1    | ..   | 1    | ..   | ..     | 10  |        |
| Phthisis .. ..                | 1                                 | ..                         | ..   | ..    | 1     | 1    | ..    | ..   | 1    | ..   | ..   | ..   | 1      | 5   |        |
| Pleurisy .. ..                | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..   | ..     | 1   |        |
| <i>Vascular System.</i>       |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Anæmia .. ..                  | 1                                 | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Cardiac .. ..                 | 1                                 | 1                          | 1    | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..   | ..     | 4   |        |
| Lymphadenitis .. ..           | 1                                 | ..                         | ..   | ..    | 2     | ..   | ..    | 1    | ..   | ..   | ..   | ..   | ..     | 4   |        |
| Lymphangitis .. ..            | ..                                | 1                          | 1    | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 3   |        |
| <i>Genito-urinary System.</i> |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Balanitis .. ..               | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | 1      | 2   |        |
| Cystitis .. ..                | 1                                 | ..                         | ..   | 1     | 1     | ..   | 2     | ..   | ..   | ..   | ..   | 1    | ..     | 6   |        |
| Epidimytis .. ..              | ..                                | ..                         | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Gonorrhoea .. ..              | ..                                | 1                          | 4    | 1     | 1     | 1    | ..    | ..   | ..   | 1    | ..   | ..   | ..     | 9   |        |
| Nephritis .. ..               | ..                                | ..                         | ..   | ..    | ..    | ..   | 1     | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| <i>Nervous System.</i>        |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Concussion .. ..              | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | 2    | ..   | ..   | ..   | ..   | ..     | 3   |        |
| Mental .. ..                  | 1                                 | ..                         | ..   | ..    | ..    | 1    | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 2   |        |
| Headache .. ..                | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Herpes zoster .. ..           | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| <i>Eyes.</i>                  |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Conjunctivitis .. ..          | 1                                 | 2                          | ..   | ..    | ..    | ..   | 1     | ..   | 1    | ..   | 2    | 1    | ..     | 8   |        |
| <i>Skin.</i>                  |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Abscess .. ..                 | ..                                | 6                          | 4    | 3     | 2     | ..   | ..    | ..   | ..   | 1    | ..   | 2    | ..     | 18  |        |
| Acute erythema .. ..          | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | ..   | ..   | ..     | 1   |        |
| Contusions .. ..              | ..                                | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Cuts .. ..                    | 1                                 | ..                         | ..   | 4     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 5   |        |
| Dermatitis .. ..              | 2                                 | 1                          | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 3   |        |
| Erythema nodosum .. ..        | 1                                 | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1   |        |
| Scabies .. ..                 | ..                                | ..                         | ..   | 1     | 2     | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 3   |        |
| Septic sores .. ..            | 10                                | 15                         | 11   | 6     | 7     | 5    | 5     | 2    | ..   | 2    | 2    | ..   | ..     | 65  |        |
| <i>General List.</i>          |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Arthritis .. ..               | 2                                 | ..                         | ..   | ..    | ..    | 1    | ..    | 1    | ..   | 1    | ..   | ..   | ..     | 5   |        |
| Beriberi .. ..                | 26                                | 4                          | 4    | 4     | 7     | 7    | 3     | 3    | 5    | 3    | 1    | 5    | ..     | 72  |        |
| Fever .. ..                   | ..                                | 1                          | 4    | 3     | ..    | 3    | ..    | 2    | ..   | 2    | 1    | 2    | 1      | 19  |        |
| Filariasis .. ..              | ..                                | 1                          | ..   | ..    | ..    | 1    | ..    | ..   | 1    | ..   | ..   | ..   | ..     | 3   |        |
| Hernia .. ..                  | ..                                | ..                         | ..   | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 1*  |        |
| Influenza .. ..               | 1                                 | 6                          | 1    | ..    | 3     | 2    | ..    | ..   | ..   | 1    | 1    | 2    | ..     | 17  |        |
| Leprosy .. ..                 | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | 1    | ..   | ..   | ..     | 1   |        |
| Malaria .. ..                 | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | 1    | ..   | 1    | ..   | ..     | 2   |        |
| Yaws .. ..                    | 1                                 | 1                          | 1    | 1     | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | ..     | 4   |        |
| Injuries to—                  |                                   |                            |      |       |       |      |       |      |      |      |      |      |        |     |        |
| Body .. ..                    | ..                                | 1                          | 2    | 2     | 1     | ..   | 1     | ..   | ..   | 3    | ..   | 1    | ..     | 11  |        |
| Arms .. ..                    | 2                                 | ..                         | ..   | ..    | 2     | 3    | ..    | 1    | 1    | ..   | 1    | ..   | ..     | 10  |        |
| Legs .. ..                    | 1                                 | ..                         | ..   | 2     | 1     | ..   | ..    | 1    | 1    | 1    | 1    | ..   | 1      | 9   |        |
| Fractures .. ..               | ..                                | ..                         | ..   | ..    | ..    | ..   | ..    | ..   | ..   | ..   | ..   | ..   | 1      | 1   |        |
| Monthly totals .. ..          | 55                                | 61                         | 46   | 40    | 43    | 29   | 30    | 20   | 20   | 18   | 19   | 19   | 8      | 408 |        |
| Died .. ..                    | ..                                | 1                          | ..   | ..    | 1     | ..   | 1     | ..   | ..   | ..   | ..   | ..   | ..     | 3   |        |

\* One case operated on developed beriberi.

Total patients treated: Chinese, 408. Died, 3.

*Black-boy Labourers admitted to Hospital in Year 1922-23.*

| Disease.                 | Number of Cases. | Disease.          | Number of Cases. |
|--------------------------|------------------|-------------------|------------------|
| Abscesses .. .. .        | 3                | Gonorrhœa .. .. . | 1                |
| Bronchitis .. .. .       | 2                | Injury .. .. .    | 2                |
| Burns .. .. .            | 1                | Pneumonia .. .. . | 5                |
| Colitis .. .. .          | 3                | Synovitis .. .. . | 1                |
| Dysentery (Bac.) .. .. . | 10               | Yaws .. .. .      | 1                |
| Fever .. .. .            | 3                |                   |                  |
|                          |                  | Total .. .. .     | 32               |

All in the last six months.

The totals of the patients receiving treatment were as follows :—

|                                                   |    |    |    |     |
|---------------------------------------------------|----|----|----|-----|
| Chinese remaining in hospital on 31st March, 1922 | .. | .. | .. | 55  |
| Chinese admissions during 1922-23                 | .. | .. | .. | 353 |
| Black-boys remaining in hospital                  | .. | .. | .. | 0   |
| Black-boy admissions during 1922-23               | .. | .. | .. | 32  |
| Total                                             | .. | .. | .. | 440 |

Three Chinese died in the wards, two from beriberi and one from cardiac disease; one of the beriberi cases died directly after admission, and the other was complicated by chronic nephritis.

## REPORT OF THE DYSENTERY CASES ADMITTED TO THE APIA HOSPITAL DURING THE EPIDEMIC OF 1923.

*History.*—A few cases of dysentery were admitted to the hospital during the last three months of 1922 and the first four months of 1923, but it was not till May, 1923, that the numbers had increased to such an extent that it became necessary to make special arrangements for dealing with them. At the end of May the isolation area *fales* were inadequate to accommodate the number of Samoan cases, so the *fales* adjacent to these were used.

The surgical activities of the hospital were restricted, except in the case of emergency, because of the risk of infection being conveyed to a convalescing patient, and also to decrease the number of patients in the hospital.

The admission-rate reached its maximum in June, and then steadily declined, as the following table will show :—

## DYSENTERY ADMISSIONS.

|                     | 1922. |      |      | 1923. |      |        |        |      |       |       |      |       |      |      |      |
|---------------------|-------|------|------|-------|------|--------|--------|------|-------|-------|------|-------|------|------|------|
|                     | Oct.  | Nov. | Dec. | Jan.  | Feb. | March. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
| Europeans .. .. .   | ..    | 5    | 3    | 9     | 2    | 7      | 5      | 14   | 25    | 12    | 3    | 2     | 1    | 1    | 3    |
| Samoans .. .. .     | ..    | ..   | ..   | ..    | ..   | ..     | 5      | 23   | 32    | 23    | 8    | 4     | 2    | 1    | ..   |
| Chinese .. .. .     | 1     | ..   | 2    | 3     | 2    | 3      | 3      | 5    | 5     | 8     | ..   | ..    | ..   | ..   | 1    |
| Melanesians .. .. . | 1     | ..   | 2    | 3     | 2    | 2      | ..     | 1    | 4     | ..    | ..   | ..    | ..   | ..   | ..   |
| Totals .. .. .      | 2     | 5    | 7    | 15    | 6    | 12     | 13     | 43   | 66    | 43    | 11   | 6     | 3    | 2    | 4    |

No cases of dysentery have been admitted to the Samoan wards for the first three months of 1924.

*Etiology.*—It became evident in April, 1923, that the sporadic dysentery cases that had been admitted to hospital during the last few months were still occurring, and would probably lead to an epidemic at the beginning of the dry season. The pathological records of the *fæces* of all the cases that had been examined showed the infection was probably bacterial, as no protozoan had been constantly found and the cell-contents were bacillary in type.

At the end of May bacterial agglutinations were started, and by the middle of June they showed that the epidemic was caused by the bacillus of shiga, as is shown in the accompanying report (Appendix A.)

Agglutinations were continued throughout the epidemic, and confirmed the original report, as is shown in the following monthly table :—

## DYSTENTERY AGGLUTINATIONS.

|                   | June.       |                | July.       |                | August.     |                | September.  |                | October.    |                | November.   |                |
|-------------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
|                   | Cases exam. | Pos. B. Shiga. | Cases exam. | Pos. B. Shiga. | Cases exam. | Pos. B. Shiga. | Cases exam. | Pos. B. Shiga. | Cases exam. | Pos. B. Shiga. | Cases exam. | Pos. B. Shiga. |
| Europeans .. .. . | 6           | 6              | 5           | 4*             | 4           | 4              | 1           | 1              | ..          | ..             | ..          | ..             |
| Samoans .. .. .   | 7           | 6              | 4           | 4              | 2           | 2              | 1           | 1              | 1           | 1              | 3           | 3              |
| Chinese .. .. .   | 9           | 6              | 4           | 3              | 2           | 2*             | ..          | ..             | ..          | ..             | ..          | ..             |
| Totals            | 22          | 18             | 13          | 11             | 8           | 8              | 2           | 2              | 1           | 1              | 3           | 3              |

\* One case included in each of these groups had a slightly higher agglutination to B. flexner than to B. shiga, but this was probably just a marked group agglutination, as no cases were seen of B. flexner agglutination without marked B. shiga agglutination.

December nil.

NOTE.—The threatened typhoid epidemic mentioned in Appendix A rapidly died out; only six suspected enteric cases were agglutinated during the remainder of 1923, with the result that three agglutinated B. typhosus and two B. paratyphosus "B," one being negative.

*Treatment.*—The first cases admitted to the hospital were treated by various methods, but later the arrival of steadily increasing numbers made it almost imperative to use some standard treatment throughout the hospital. Sodium sulphate was selected as being the drug that had given the most satisfactory results, and a system of treatment and dieting, as shown in Appendices B and C, was started in the Samoan and European wards.

The instructions were issued in English and Samoan to the Samoan wards, so that they could easily be explained to the relatives of the sick: this in a great measure overcame the difficulty that had been experienced in preventing relatives overfeeding the patients.

A few selected cases were treated with anti-dysenteric serum, but the numbers were too small to give a reliable indication as to the value of this method of treatment.

*Results.*—The results of the treatment were on the whole good, only six deaths occurring in the hospital during the year. Of these, four were in children under two years of age, three being Europeans and one a Samoan. The other two cases were: one a mental case, the infection being contracted at the gaol—she was too excitable to rest or receive efficient treatment. The second case was that of a Samoan girl who died within a few hours of admission.

Altogether 195 cases of dysentery were treated at the hospital, with six deaths; but a few of the Samoan patients were taken out by their relatives before the treatment was completed, and consequently the results are not known.

#### APPENDIX A.

A PRELIMINARY REPORT ON THE AGGLUTINATION REACTION OF THE SERA OF PATIENTS SUFFERING FROM DYSENTERY AND ENTERIC FEVER DURING THE PRESENT EPIDEMIC IN WESTERN SAMOA.

THESE agglutinations were all done with the blood serum of the patients against stock bacillary emulsions from the Commonwealth Quarantine Service Laboratories of Australia, and the method used was the "Garrow's Agglutinationmeter."

In all twenty-seven patients were examined, of whom twenty-two were clinically dysentery cases and five enteric fever, with the following results:—

##### DYSENTERY CASES.

| —                 | Cases examined. | Pos. B. Shiga. | Highest Dil. | Pos. B. Flex. | Negative. |
|-------------------|-----------------|----------------|--------------|---------------|-----------|
| European .. ..    | 3               | 3              | 1 in 320     | Nil           | 0         |
| Half-caste .. ..  | 3               | 3              | 1 in 160     | Nil           | 0         |
| Samoans .. ..     | 7               | 6              | 1 in 80      | Nil           | 1         |
| Melanesians .. .. | 3               | 1              | 1 in 80      | Nil           | 1         |
| Chinese .. ..     | 6               | 5              | 1 in 160     | Nil           | 2         |
| Totals .. ..      | 22              | 18             | ..           | ..            | 4         |

##### Enteric Fever Cases.

| —                | Cases examined. | Pos. "T." | Highest Dil. | Pos. Para. "A." | Pos. Para. "B." |
|------------------|-----------------|-----------|--------------|-----------------|-----------------|
| Europeans .. ..  | 1               | 1         | 1 in 680     | Nil             | Nil             |
| Half-caste .. .. | 1               | 1         | 1 in 320     | Nil             | Nil             |
| Chinese .. ..    | 3               | 3         | 1 in 640     | Nil             | Nil             |
| Totals .. ..     | 5               | 5         | ..           | ..              | ..              |

Amongst the European dysentery cases one agglutinated slightly to B. flexner in a dilution of 1 in 160, but the same case agglutinated to B. shiga in a dilution of 1 in 320, so that the case is probably one of shiga infection with a marked group agglutination.

One of the Chinese cases agglutinated at a dilution of 1 in 20 to B. flexner on the fourteenth day of the disease, but by the first day the agglutination to B. shiga had risen to 1 in 80, while B. flexner only slightly agglutinated at 1 in 40, showing that the infection was B. shiga.

The two negative results from the Melanesians were probably due to using too great a dilution of the serum (1 in 20 being the lowest dilution used at that time), and possibly to a greater delay in the production of agglutinins in the Melanesian race.

A post-mortem examination of a case of dysentery in a Melanesian whose blood was not examined showed the typical lesions of a bacillary dysentery.

The one negative result amongst the Chinese cases was a severe case of dysentery which had the blood taken on the sixth day of the disease, so that probably the agglutinins will develop later. In all the other cases the serum was taken on the twelfth to the sixteenth day—mostly on the twelfth day; and a positive result was recorded when the agglutination to *B. shiga* was 1 in 20 or over, and any agglutination to *B. flexner* that might be present was less than that to *B. shiga*.

*Enteric Cases.*—All the enteric cases showed an agglutination in at least a 1 in 320 dilution of the serum to *B. typhosus*, except one Chinese case which was done on the eighth day and only agglutinated up to a dilution of 1 in 160, but this case showed no group agglutination at all; the others all agglutinated slightly to *B. paratyphosus* "A," either 1 in 20 or 1 in 40, but not to *B. paratyphosus* "B" at all.

*Conclusion.*—I think that the present epidemic of dysentery is entirely caused by the bacillus of shiga, and that the enteric fever cases are caused by the bacillus typhosus.

JOHN S. ARMSTRONG, M.B., Ch.M., D.T.M. and H.

24th June, 1923.

## APPENDIX B.

### TREATMENT OF BACILLARY DYSENTERY, SAMOAN HOSPITAL.

ON admission: *Ol. Ricini*, 1 oz.; proportionate doses for children. *Mist. Sod. Sulph.\**: Two-hourly for forty-eight hours; four-hourly for forty-eight hours; T.I.D. until the stools become *fæcal*.

Stop all medicines between 10 p.m. and 6 a.m.

For the relief of pain: hot applications to the abdomen; hot saline irrigation of the colon.

For the relief of tenesmus: starch enema after the irrigation.

\* The dose was 1 drachm in  $\frac{1}{2}$  oz. of water flavoured with 10 minims of *Syrup Aurantii* for an adult.

#### *Diet.*

No. 1: For the first twenty-four hours give albumen-water and barley-water.

No. 2: Add coconut-milk, the water in which mummy-apples have been boiled, tea, vaisalo, water arrowroot, water sago.

No. 3: Add boiled rice, milk and water, arrowroot biscuits, chicken-soup, eggs.

No. 4: Add chicken, bread.

No. 5: Ordinary, excluding the coarser vegetables.

## APPENDIX C.

### TREATMENT OF DYSENTERY, EUROPEAN HOSPITAL.

ON admission: *Ol. Ricini*, unless patient has had this before admission. *Mist. Sod. Sulph.\**: Every two hours for forty-eight hours; Every four hours for forty-eight hours; T.I.D. before the stools become *fæcal*.

For the relief of pain: Hot applications to the abdomen; colonic irrigation with hot saline.

For the relief of tenesmus: Starch enema after the irrigation.

\* The dose for an adult was 1 drachm in  $\frac{1}{2}$  oz. of water flavoured with *Syrup Aurantii* — minims 10.

#### *Diet.*

No. 1: Albumen-water, barley-water for twenty-four hours; also sugar of milk.

No. 2: Add coconut-milk, tea, Brand's essence, jelly, water arrowroot, chicken soup (clear).

No. 3: Add milk-puddings, milk foods, poached egg, or pounded fish.

No. 4: Add chicken, toast, biscuit.

No. 5: Add potatoes and gravy, bread and butter.

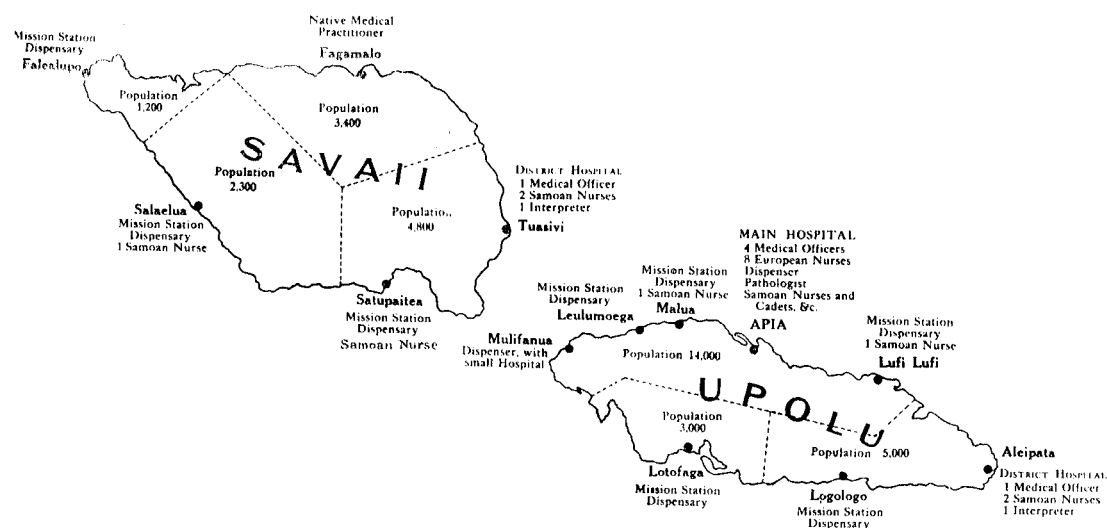
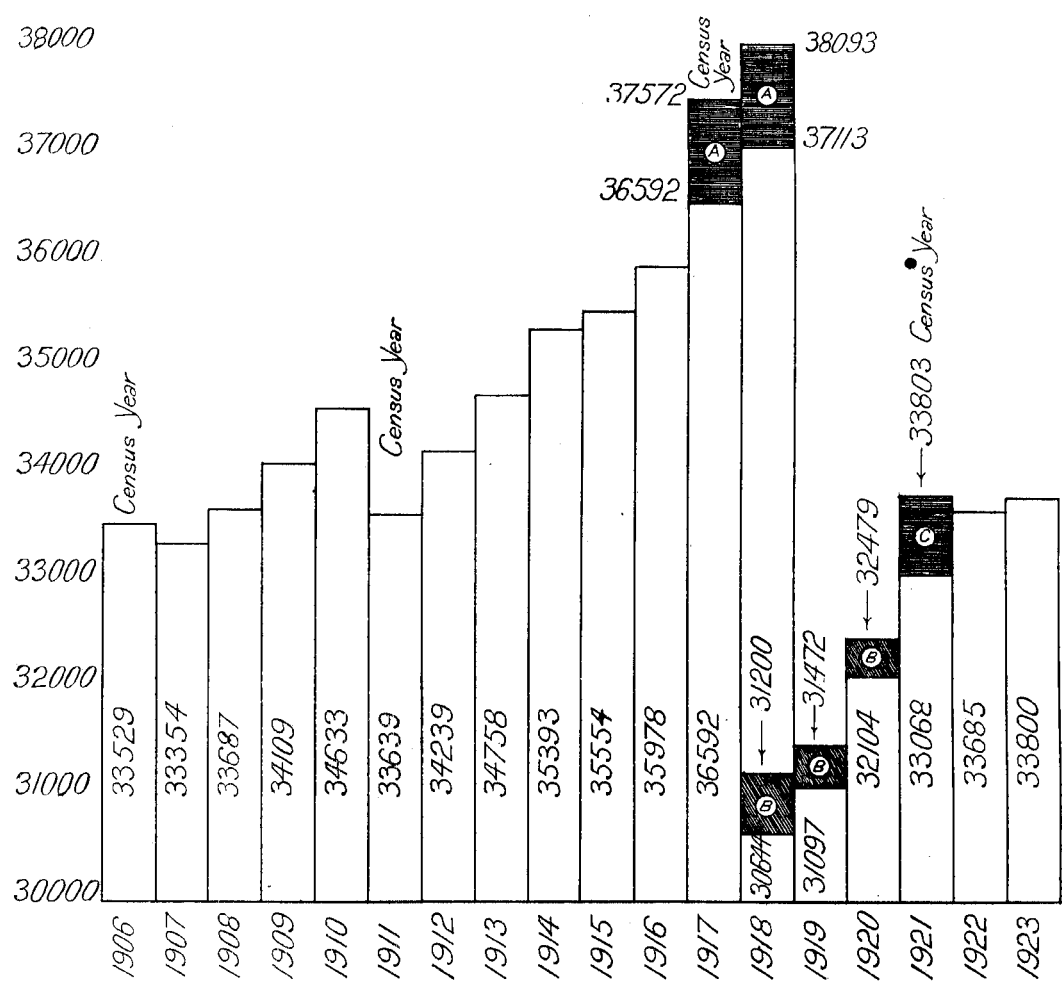


FIG. 14.—Map of Samoa, showing positions of out-stations and dispensaries. Topography of the country is the deciding factor in the delimitation of districts. In Savaii lava-fields divide the island into three sections. In Upolu, mountains limit the areas. In the most populous area shown, that round Apia, it is possible to travel by motor-car from the boundary near Lufilufi to that beyond Mulifanua. Elsewhere in the islands travelling has to be done on foot, on horseback, or by boat.



A = Probable overestimate of population at 1917 Census.  
B = Underestimate of population as shewn by working back from 1921 Census.  
C = Overestimate of population at 1921 Census, discovered by careful re-checking of the returns.

FIG. 15.—Graph showing Native population of Western Samoa, 1906–23.

— Scales 1/2 in. = 1 foot —

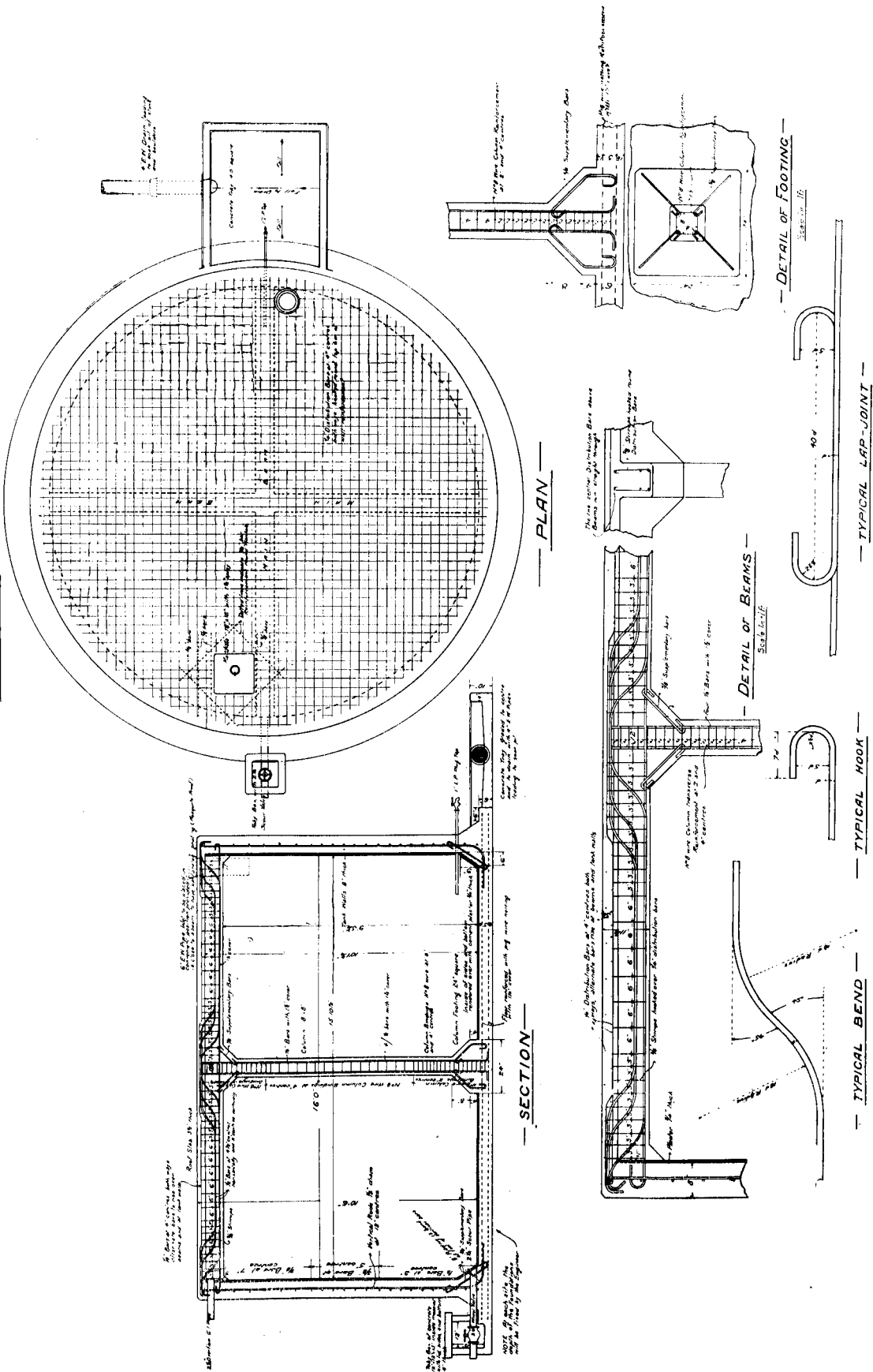


Fig. 16.—Reinforced concrete tank (12,000 gallons capacity).

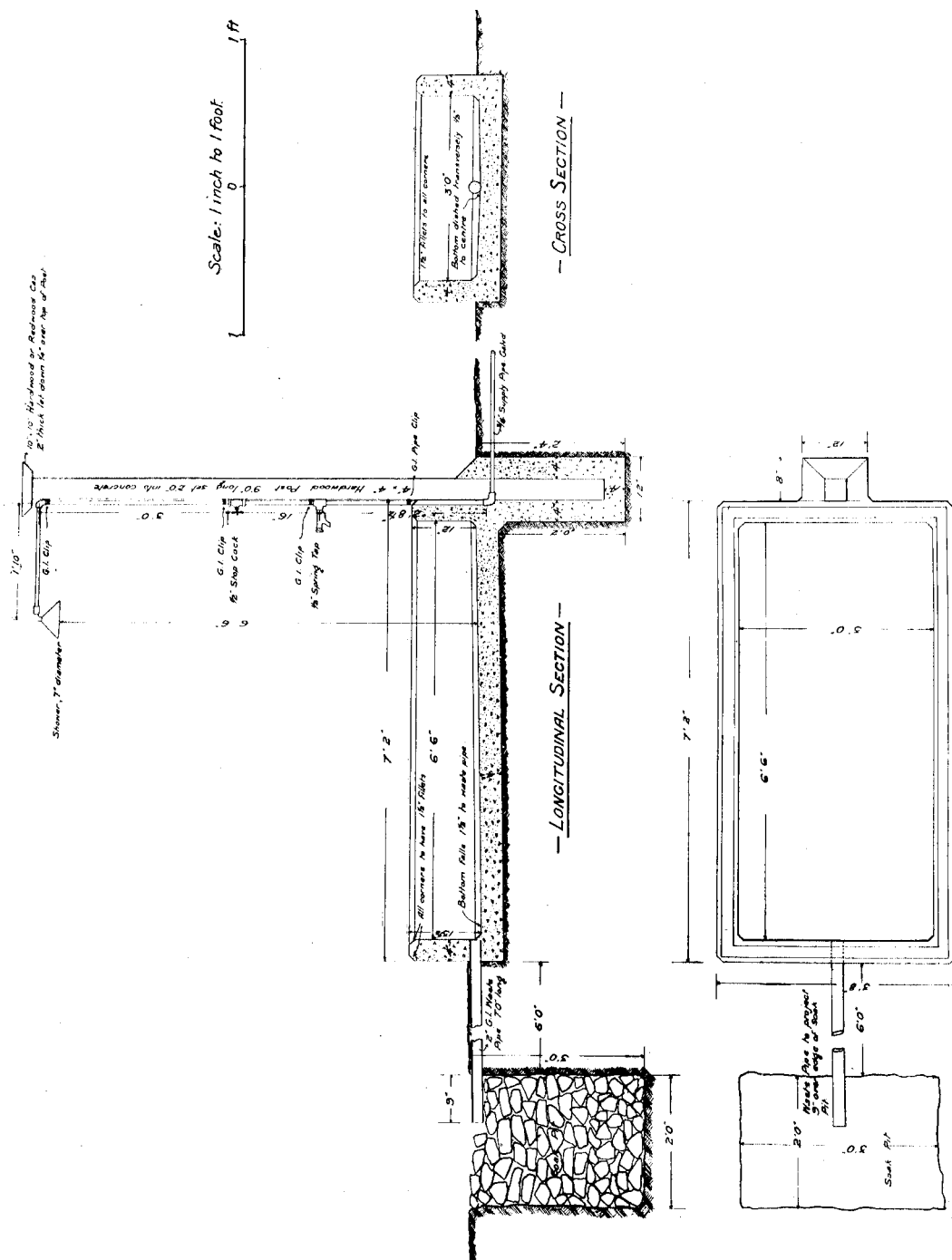


Fig. 17.—Standard concrete bath and shower for Native villages with reticulation water-supplies.

# Krankenhaus-Anlage in Samoa.

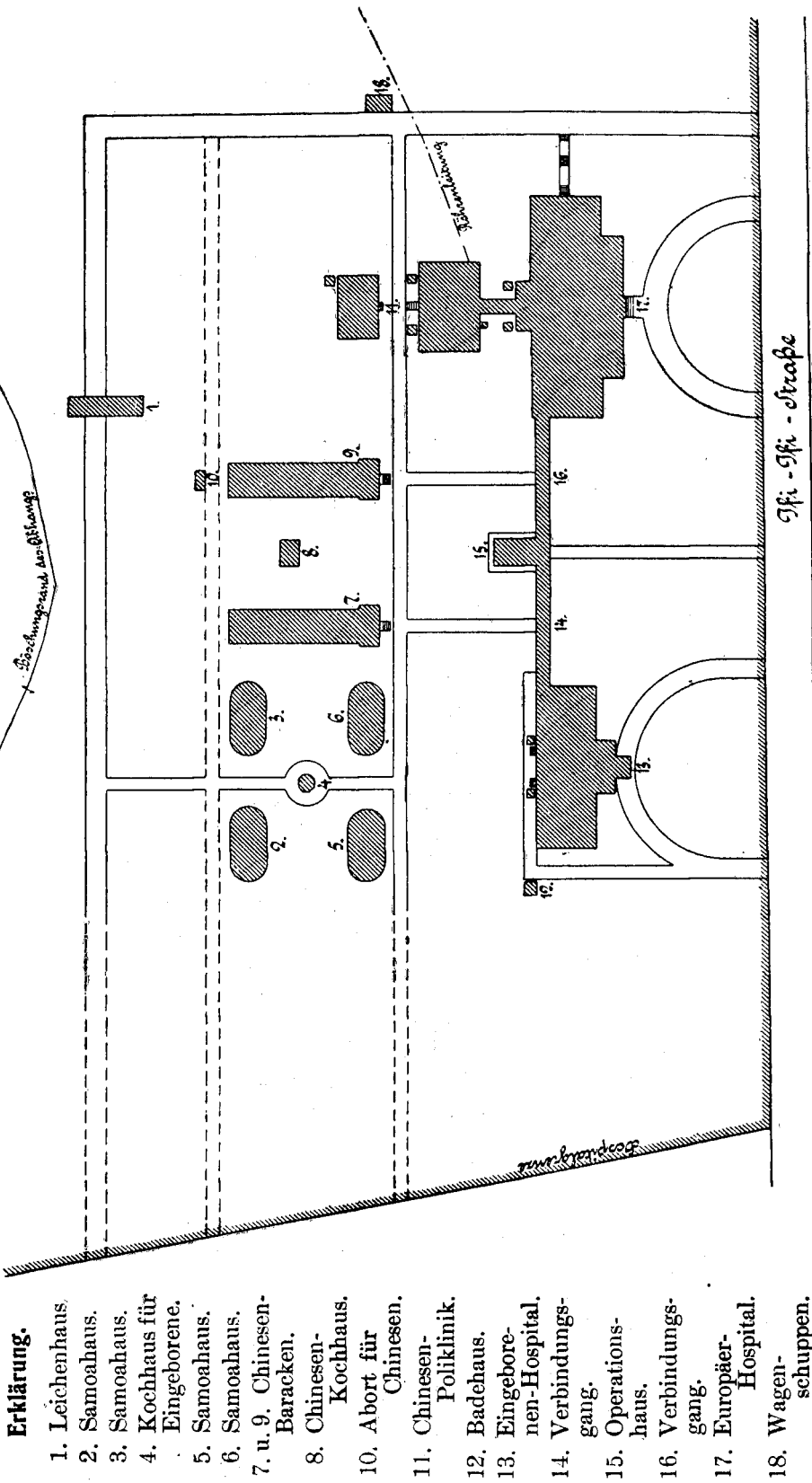


Fig. 18.—Apia Hospital in 1907. In 1914 the hospital was as shown, with the exception of *fale* (Samoahaus) No. 3, which had disappeared, and *fale* No. 6, which had been replaced by a half-Samoan half-European building. For advance made since that date see Fig. 19.

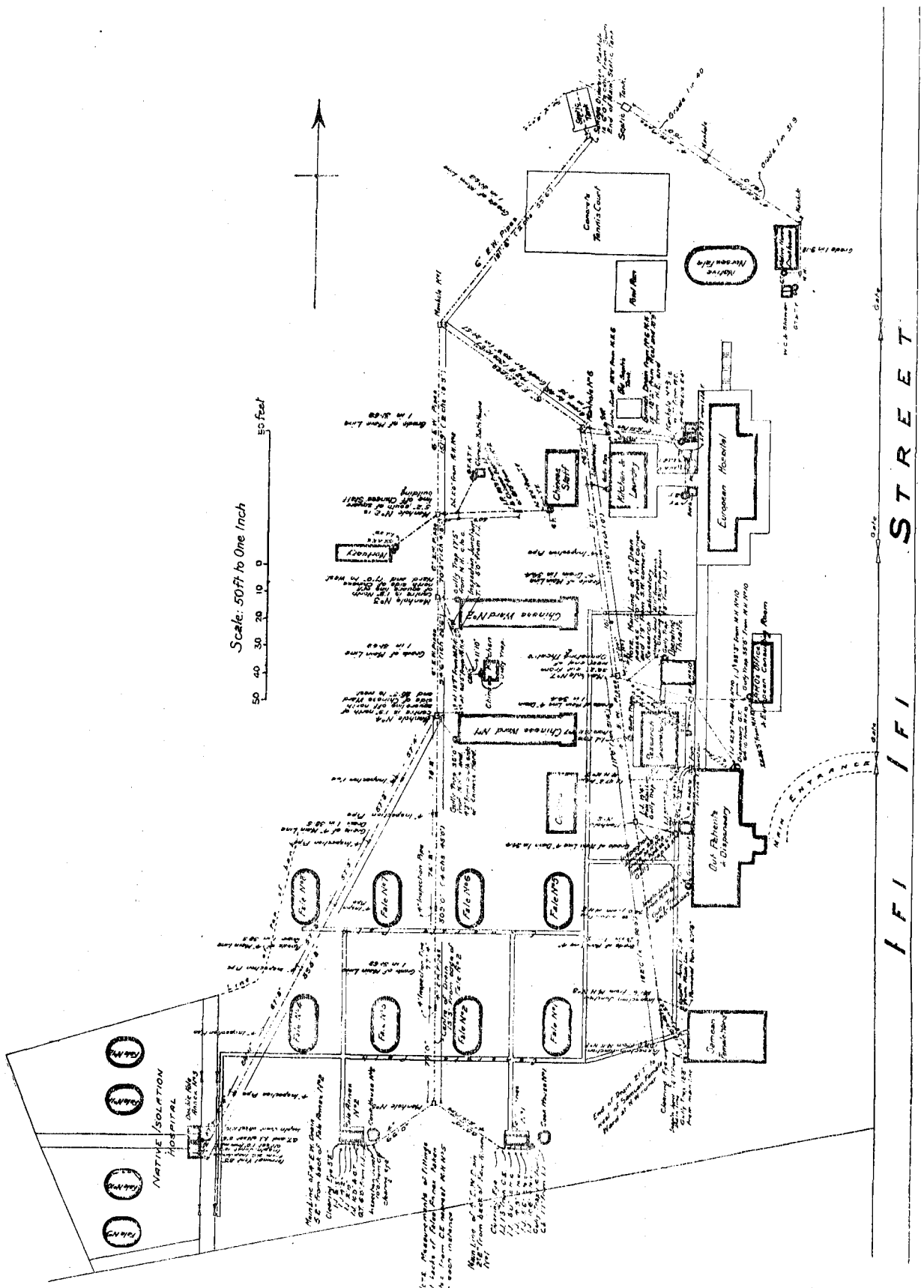


FIG. 19.—Apia Hospital, 1923: plan showing drainage connections.

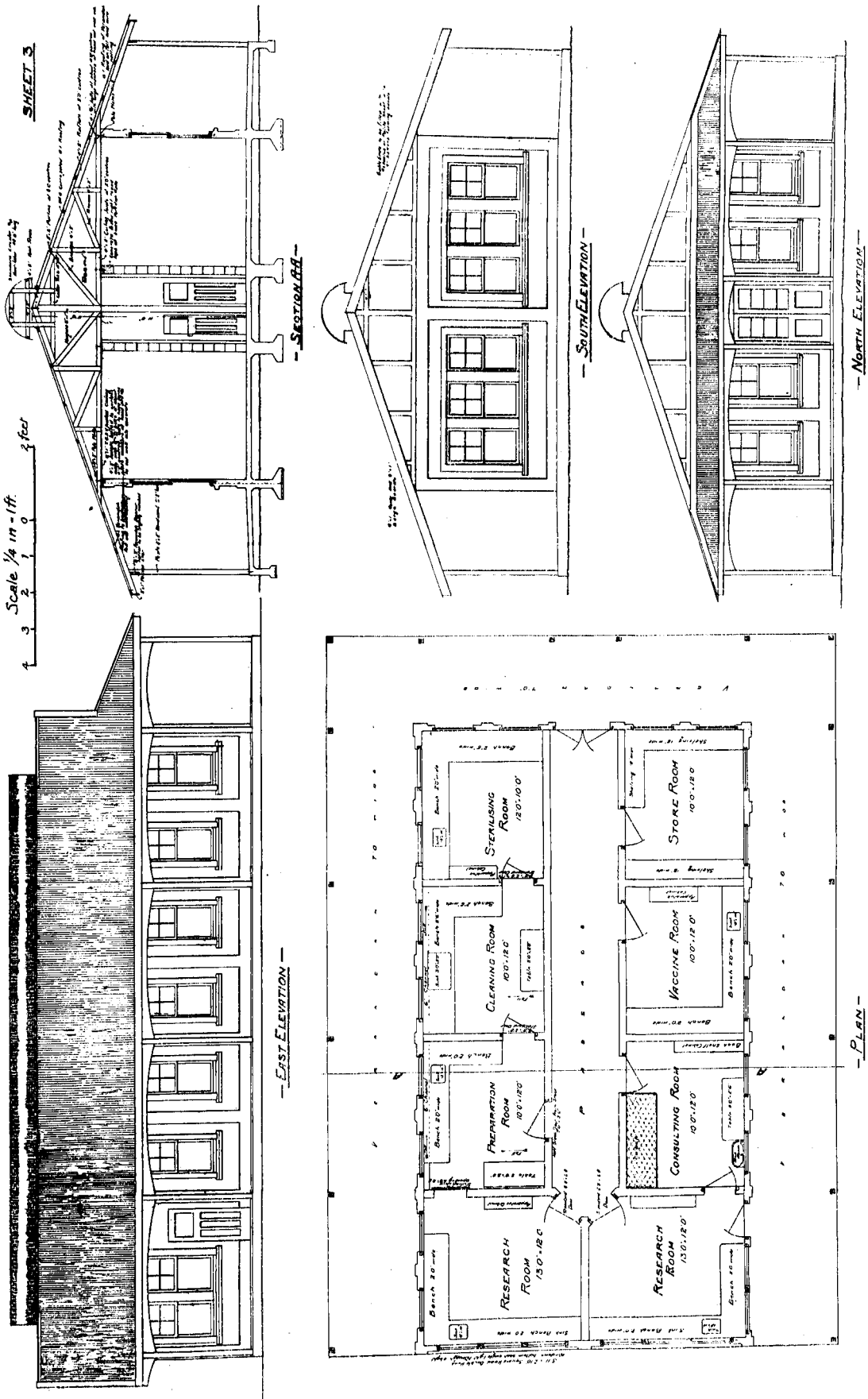


Fig. 20.—Apia Hospital: laboratory, built 1921. This laboratory is at present being used by the London School of Tropical Medicine Research Expedition, under Dr. P. A. Buxton.

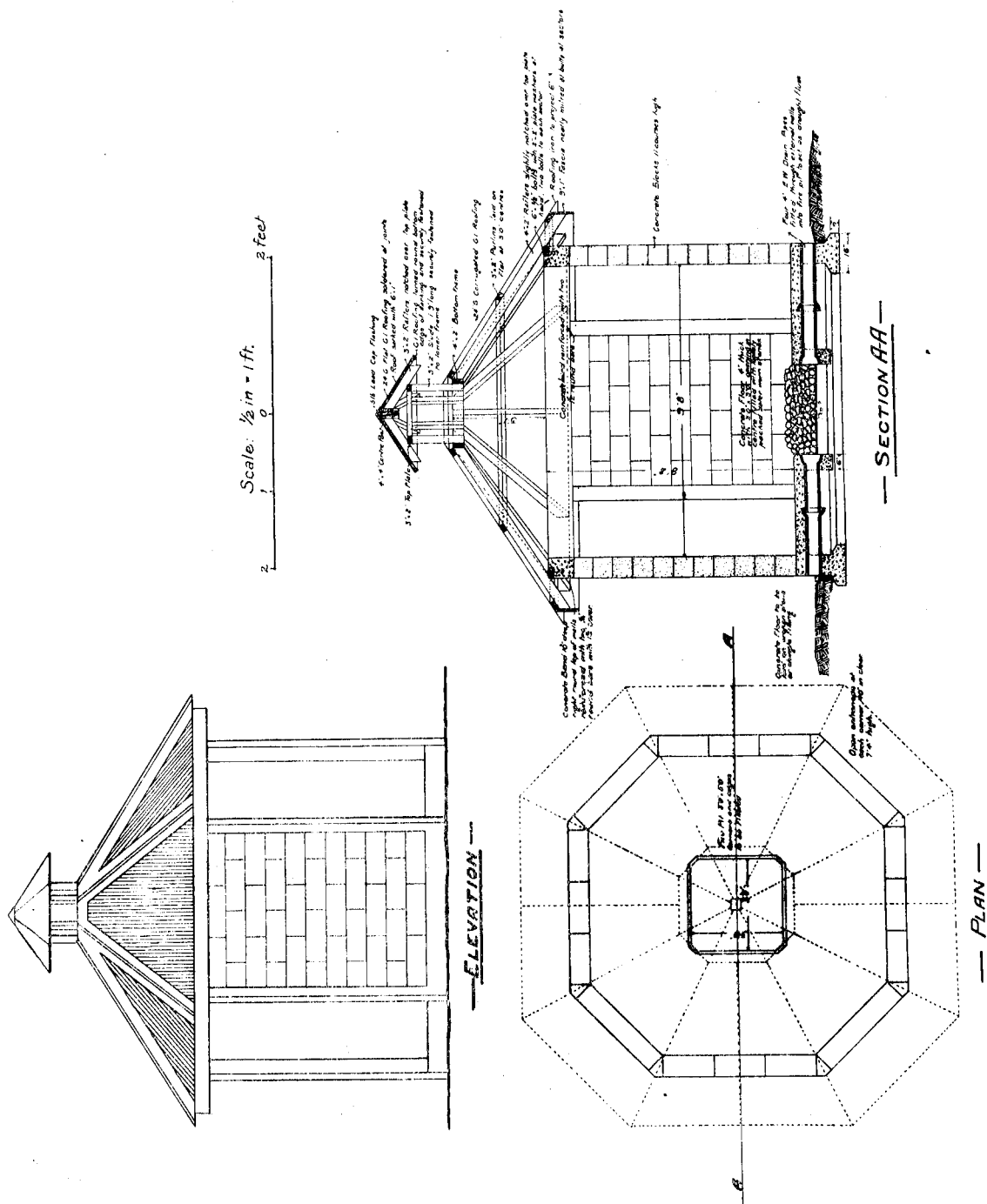


FIG. 21.—Plan of cookhouse for Samoans, Apia Hospital. The feeding of in-patients is a duty of their friends. Each in-patient is permitted to have one friend as attendant. Others bring the food, and the attendant, under medical supervision, cooks it for the patient. The cookhouse is so constructed that all foods can be cooked in Native fashion. Storage of food in the cookhouse is not permitted.

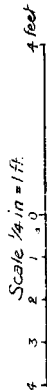


Fig. 22.—Although the Natives know very little or nothing of methods of sanitation, the amount of trouble caused by blockage of drains, or rough handling of cisterns, has been much less than was anticipated. (See also Fig. 9.)

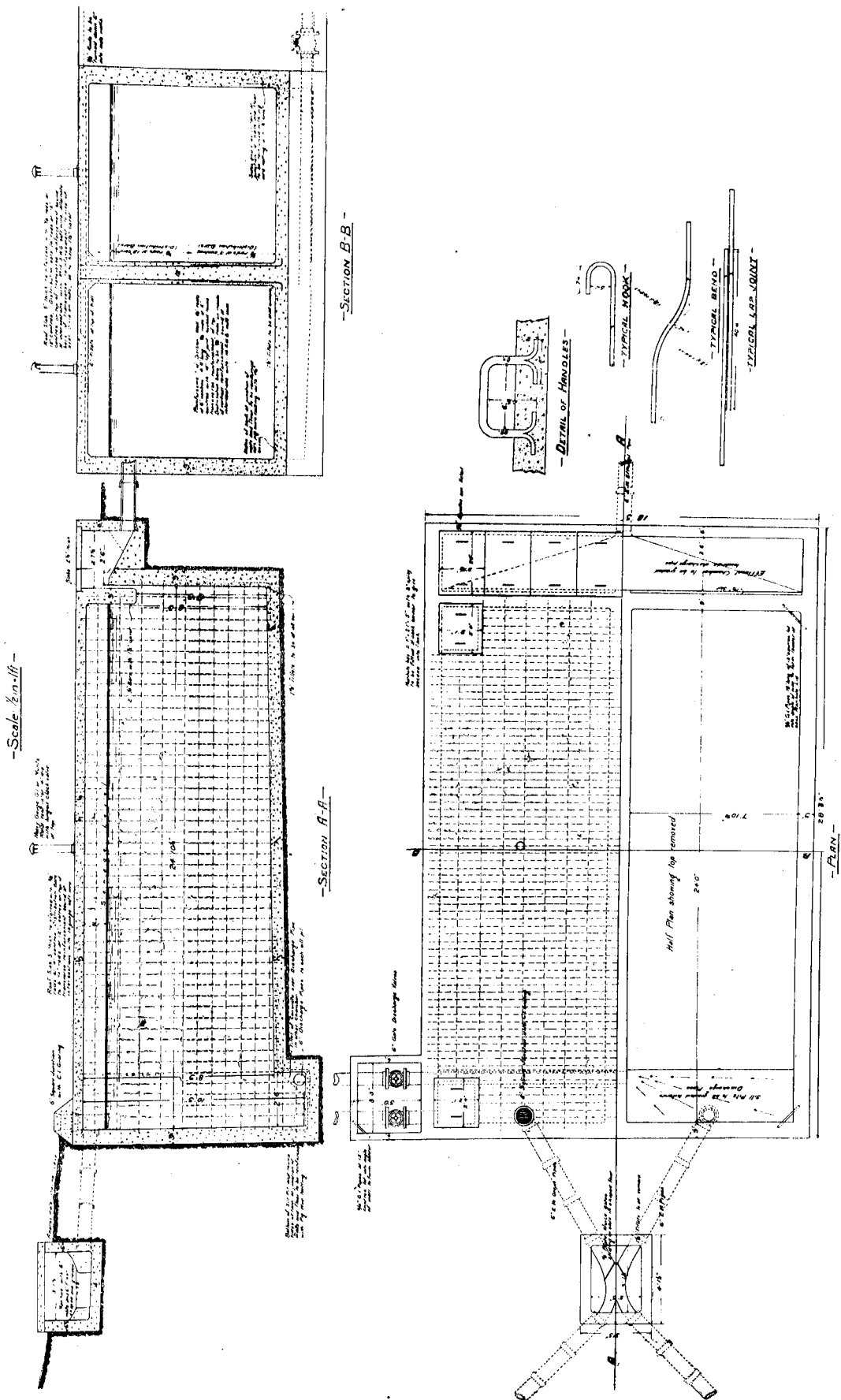


FIG. 23.—Hospital, Apia : proposed septic tank.



