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GOLD COAST COLONY.

REPORT

ON THE

Medical Department

FOR THE YEAR

1932-33.

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Printed by the Government Printer at the Government Printing Office, Accra. To be purchased from the Government Printing Office (Publication Branch), Accra, Gold Coast Colony, and from the Crown Agents for the Colonies, 4 Millbank, London, S.W.1.

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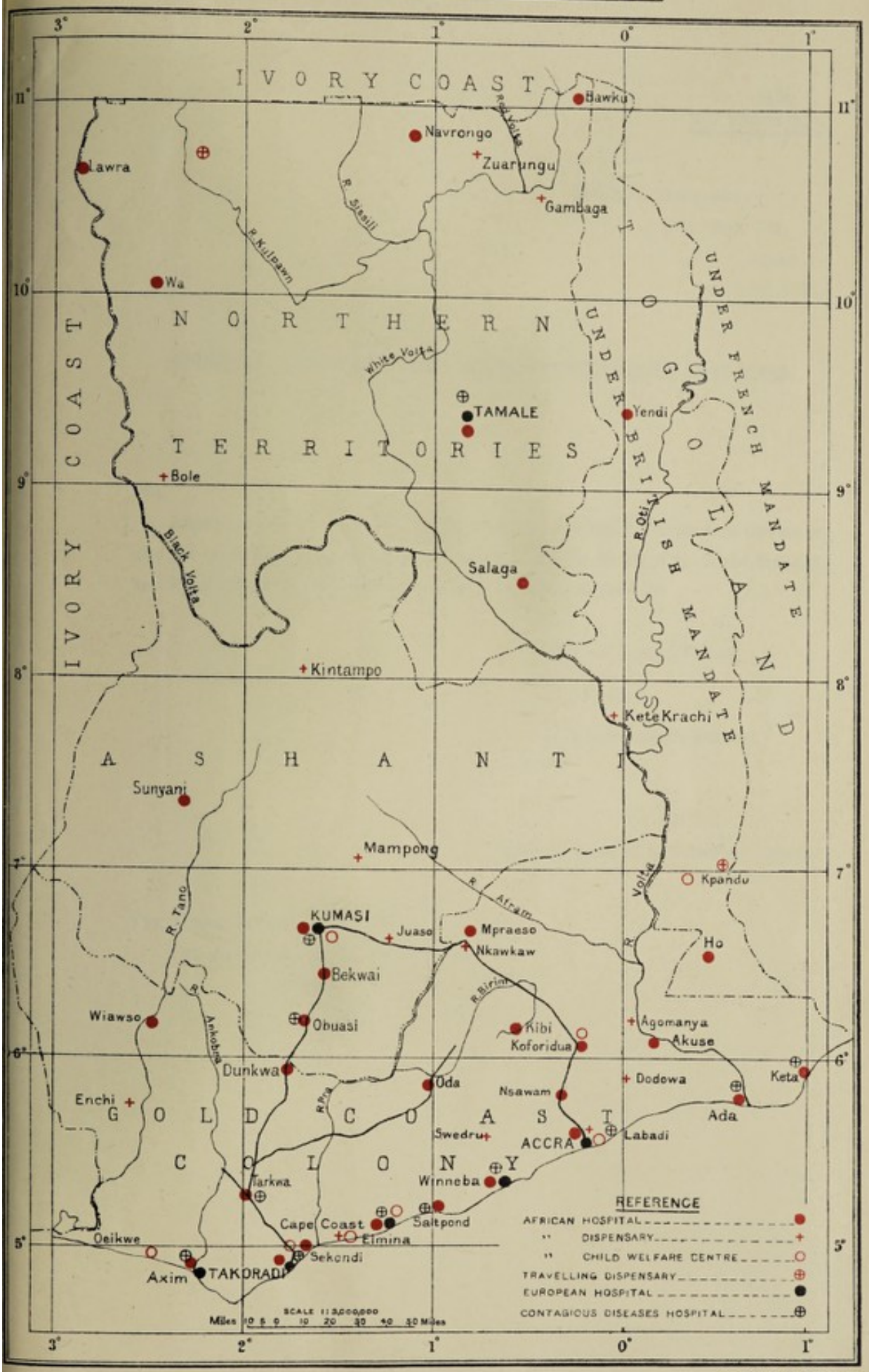
THE GOLD COAST MEDICAL FACILITIES MAP.



SURVEY H. Q. ACCRA, 1933.

1150
No. 190/32/114.

MEDICAL DEPARTMENT,
P.O. BOX 138,
ACCRA,
1st *April*, 1933.

ANNUAL MEDICAL AND HEALTH REPORT, 1932–1933.

SIR,

I have the honour to submit for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State the Medical and Health Report of the Gold Coast Colony for the year 1932–33.

I have the honour to be,

SIR,

Your obedient Servant,

D. DUFF,
Director, Medical and Sanitary Service.

THE HONOURABLE
THE ACTING COLONIAL SECRETARY,
ACCRA.

CONTENTS.

SUMMARY OF FEATURES.

RETURNS.

APPENDICES.

MAPS, DIAGRAMS, ETC.

SHORT SUMMARY OF THE PRINCIPAL FEATURES OF THE REPORT.

1. The total number of patients dealt with by the Medical Branch during the year was 206,870 being an increase of 4.37 per cent on the previous year. The strain on the staff of Medical Officers has further increased.

2. The European Community enjoyed better health. The death rate had noticeably dropped, having come to .27 per cent of the total number resident from .78 per cent, a low record. The percentage of sick to the average number resident, was about the same as before in the case of European Officials, and somewhat higher for African Officials, *see* pages 10 and 13.

3. The health of African Officials was not so good as in the past two years. There was more sickness and the Invaliding Rate had nearly doubled, *see* page 13.

4. Fortunately there were no epidemics, although a rapid increase which has taken place in the number of cases of Sleeping Sickness seen in the Northern Territories and Ashanti, is causing anxiety. The incidence per 10,000 of all cases treated has rapidly increased from 6.56 in 1929–30 to 33.11 in 1932–33. The chief focus is in Southern Mamprussi in the Northern area of British Mandated Togoland. Steps have been taken to deal with the problem, *see* page 6.

5. There was no epidemic of Yellow Fever. Three cases amongst Africans were reported with two deaths.

6. The percentage of yaws cases of all cases treated by the Medical Branch, showed an increase, *see* page 9.

7. The Travelling Dispensary functioned in the Northern Section of the Ho district of British Mandated Togoland, and was much appreciated, *see* page 40.

8. Malaria, as always, was one of the chief causes of sickness and ill-health. The percentage of all cases treated remains about the same year after year, and the percentage of days lost to the total days lost, remains steadily at about 20 per cent, *see* page 10.

9. The case incidence of Blackwater Fever was noteworthy. There were only five cases amongst Europeans and no deaths. This is probably the lowest figure on record, *see* page 6.

10. The number of cases of Enteric which, in the previous year, had dropped to 35, rose again to 75 during the period, *see* page 7.

11. The incidence of Tuberculosis varies little from year to year. It is difficult to be sure whether it is increasing or not. The close association between the gold mining industry and a high rate for Tuberculosis is exemplified in the mining areas of the Gold Coast, *see* page 8.

12. Preventive measures against Malaria by filling lowlying swampy areas and draining by means of earth gutters fed by herring-bone collaterals, were extended in many areas, *see* page 15.

13. Owing to shortage of staff it is more difficult to maintain the former standard of mosquito control. This may bring its penalty, *see* page 17.

14. The general standard of sanitation has suffered a set back owing to shortage of money.

15. Tuberculosis retained its position as second on the list of fatal diseases, *see* page 22.

16. Sporadic cases of Anthrax occurred throughout the country. There is no tendency for the disease to spread, *see* page 24.

17. Most deaths occurred during the first three months of the Calendar year. The duration and intensity of the Harmattan is the important seasonal factor, *see* page 26.

18. Domiciliary visiting was steadily carried out by Women Medical Officers and Health Visitors attached to Welfare Centres, and by the Red Cross Sisters, attached to the Clinics at Cape Coast and Sekondi, *see* page 30.

19. The number of deaths from starvation (31) was double that of the previous year (15), *see* page 32.

20. The Gold Coast League for Maternal and Child Welfare Section of the Gold Coast Branch of the British Red Cross Society, carried out useful work among the mothers and children, both by domiciliary visits, and at the various weighing clinics. Mothers in the advanced centres are more and more coming to appreciate the value of the weighing clinics. An encouraging sign, *see* page 36.

21. During the past year the Gold Coast Branch of the British Red Cross Society was formed, links have been organised in various areas and most useful spade work accomplished, *see* page 35.

22. The Training School for Sanitary Inspectors in Accra has almost ceased to exist owing to curtailment of staff, *see* page 35.

23. Port Health work was carried on successfully particularly at Takoradi, and to a less degree at Accra, Keta, Winneba, Saltpond, etc. No port was declared infected during the year, *see* page 36.

24. The figures returned by the Infant Welfare Clinics unavoidably showed a decrease, *see* page 36.

25. The Isolation Block at the Gold Coast Hospital was converted into a children's ward and was most popular with the children, *see* page 38.

26. The Nurse-Dispensers' scheme proceeded, although seriously curtailed owing to lack of funds, *see* page 38. An outline of the scheme will be found at Appendix 7, page 94.

27. The Maternity Hospital, Accra, continued its excellent work. The numbers again showed an increase, creating a new record. A separate septic block has been planned, page 36. At Appendix 4, page 84, will be found the Annual Report of the Woman Medical Officer in charge.

28. The new African Hospital at Navrongo began work and was greatly appreciated. A valuable outpost amongst a primitive section of the people has thus been established, *see* page 39.

29. Medical work undertaken by the Missions is recorded on page 40.

30. A note on the Lunatic Asylum appears on page 41.

31. A Report on the Leper Settlement at Ho will be seen on page 87.

D. DUFF,
Director of Medical and Sanitary Service.

Annual Medical and Health Report for the Year 1932-33.

I.—ADMINISTRATION.—MEDICAL, HEALTH AND LABORATORY BRANCHES.

Table I on page 53 shows the actual staff of the Medical, Health and Laboratory branches of the Medical Department.

(*a*) MEDICAL BRANCH.

European Staff.

Promotions :—

Dr. John R. Forde, Senior Medical Officer ; Mr. Arthur Buckner, Radiographer; Miss Maud G. Le Bas, Matron, Gold Coast.

Appointments :—

Dr. J. A. K. Fitzgerald, Medical Officer ; Dr. E. R. Gauld, Medical Officer ; Mr. E. A. Barham, Assistant Radiographer ; Miss H. A. Cain, Nursing Sister ; Miss Irene J. Inness, Nursing Sister ; Miss Hilda M. Barr, Nursing Sister ; Miss Ann Sparrow, Nursing Sister.

Transfers :—

Dr. J. H. Owen-Flood, Medical Officer of Health, from Health Branch to Medical Branch as Medical Officer ; Dr. E. S. E. Mack, Medical Officer, to Nigeria as Senior Medical Officer ; Miss C. E. Robinson, Nursing Sister, to Nigeria as Senior Nursing Sister ; Miss M. M. E. Broderick, Nursing Sister, to Nigeria ; Miss V. E. Kirby, Nursing Sister, to Nigeria.

Retirements :—

Dr. H. W. Gush, Surgical Specialist ; Dr. W. I. Martyn-Clarke, Senior Medical Officer ; Dr. M. de Bono, Medical Officer ; Dr. E. L. Sanders, Medical Officer ; Dr. J. Caplan, Medical Tutor ; Dr. M. M. McDowall, Woman Medical Officer ; Mr. George McLardie, Radiographer (invalided) ; Mr. Robert Simmons, Analytical Chemist ; Miss E. D. Higham, Nursing Sister ; Miss Sarah Bentley, Nursing Sister ; Miss T. Grant, Nursing Sister.

African Staff.

Promotions :—

Second Division Dispensers :—Messrs. E. W. L. Addy, E. E. Akuetteh, J. A. W. Cudjoe, R. J. Cummings, J. C. Kumi, Clement A. Quartey, E. T. Q. Vanderpuye, W. O. T. Annan, R. S. Barnor, George Condua, W. T. Okine, R. O. Quarcoopome.

First Division Nurse :—J. Y. Kumah.

Second Division Nurses :—Messrs. B. I. Arthur, James Brobby, C. J. K. Boateng, D. K. Anim, Horatio A. Bainton, Alfred A. Quartey, E. B. Quinton Cofie, D. M. Timpo, V. O. Codjoe, N. T. Nartey, J. Asmah, A. W. Osei, J. W. Formson, Misses Susuana Boafo, Christiana Magnusen, Amy S. Bentil, Martha C. Quaynor, Emily A. Kotei, Naomi O. Okine.

Appointments :—

Thirty-nine Nurses-in-Training.

Two Mental Nurses.

Midwives-in-Training :—Harriett Adelaide Ernestina Bruce, Leonora Lomoley Lomotey, Clara Kai Affuah Robertson.

Retirements :—

Messrs. E. C. Attuquaye, Dispenser-in-Training ; Peter Osei Tutu, Dispenser-in-Training ; Sampson Labbi, 1st Division Nurse ; T. S. Obeney, 2nd Division Nurse ; J. J. K. Otoo, 2nd Division Nurse ; E. K. Quartey, 2nd Division Nurse ; J. D. Appiah, 2nd Division Nurse ; Misses Diana Mills, 2nd Division Nurse ; Beatrice F. Anobi, 2nd Division Nurse.

Twenty Nurses-in-Training.

Two Mental Nurses.

(*b*) HEALTH BRANCH.

European Staff.

Promotions :—

Dr. D. Lennox, Senior Health Officer; Mr. P. P. Horn, Chief Sanitary Superintendent.

Appointments :—

Dr. K. C. MacKenzie, Temporary Acting Medical Officer of Health.

Other changes in the staff during the year :—

Dr. H. C. E. Quin, Senior Health Officer, and Mr. H. T. Lucas, Senior Superintending Sanitary Inspector, retired on pension. Drs. H. V. R. Miller, J. H. Pottinger, T. V. Fitzpatrick, S. P. Wilson, R. Stuart and J. N. Leitch, Medical Officers of Health, were retrenched.

Misses E. M. Stratton, I. M. M. Aitken and F. A. Adam, Women Medical Officers, were retrenched.

Dr. J. H. Owen-Flood was re-transferred to the Medical Branch.

African Staff.

Appointments :—

One Sanitary Inspector-in-Training.

Two Midwives.

Four Nurses-in-Training.

Promotions :—

Mr. F. R. Connor Nartey, First Division Sanitary Inspector.

Other changes in the staff during the year :—

Mr. J. Fianu, Mr. E. H. Nortey, 1st Division Sanitary Inspectors, and Mr. H. V. Gouch, 2nd Division Sanitary Inspector, retired on pension.

One Second Division Sanitary Inspector was invalided out of the Service.

One Second Division Dispenser, and two Second Division Clerks, were retrenched.

One Second Division Sanitary Inspector, was dismissed.

Two Midwives, and four Nurses-in-Training, resigned their appointments.

(*a*) LABORATORY BRANCH.

Retirement :—

Mr. F. Leeson, Laboratory Superintendent.

ORDINANCES AFFECTING THE PUBLIC HEALTH.

1. The following are the more important additions or amendments to public health legislation in the Gold Coast and its Dependencies during the year :—

(*a*) Orders in Council under the Mosquitoes Ordinance applying its provisions to various areas and places in the Eastern and Central Provinces—villages on the Accra–Nsawam, Accra–Dodowa and Aburi–Dodowa Roads to Abokobi, Sra, Odome, Ekwamkrom, Asamkrom, etc.

(*b*) Orders under the Vaccination Ordinance making vaccination compulsory in the Western and Eastern Dagomba Districts. An important Order, No. 8 of 1932, modified the existing methods of vaccination.

(*c*) Regulations under the Towns Ordinance licensing bakeries at Sekondi, and declaring the town boundaries of Winneba. The provisions of the Towns Ordinance were applied to Akwatia, Ada, Otrokpe and Totimeh.

(*d*) An Order under the Diseases of Animals Ordinance declared Akuse infected with rabies.

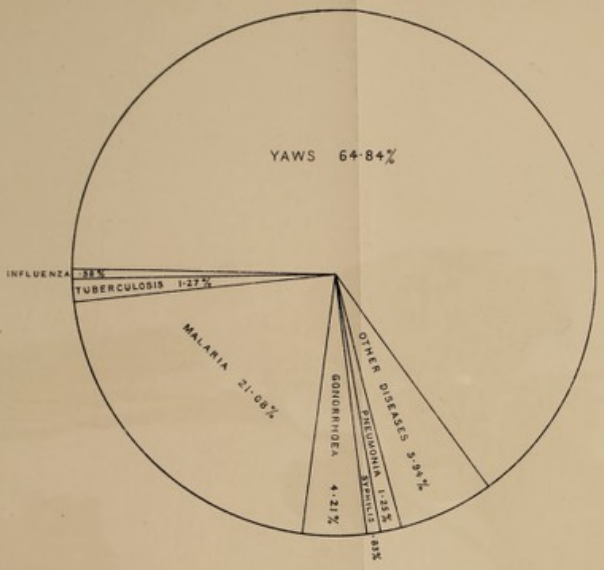
(*e*) Takoradi was declared a Registration Area under the Births, Deaths and Burials Ordinance.

FINANCE.

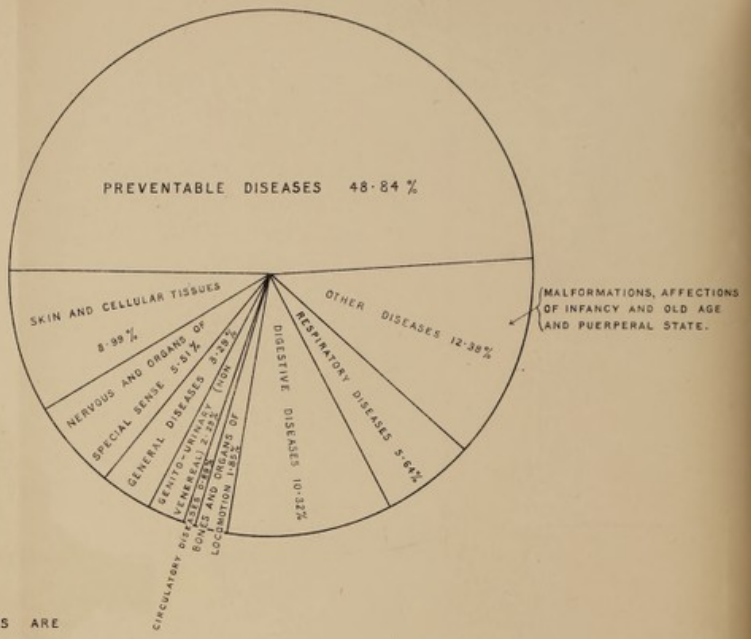
2. The total revenue earned by the Medical Department (all branches) during the financial year 1932–33, amounted to £39,068 as compared with £34,658 in 1931–32.

3. The total Ordinary (i.e. Recurrent) Expenditure for the Colony was £2,647,486.

INFECTIVE DISEASES TOTAL INCIDENCE 96,480.

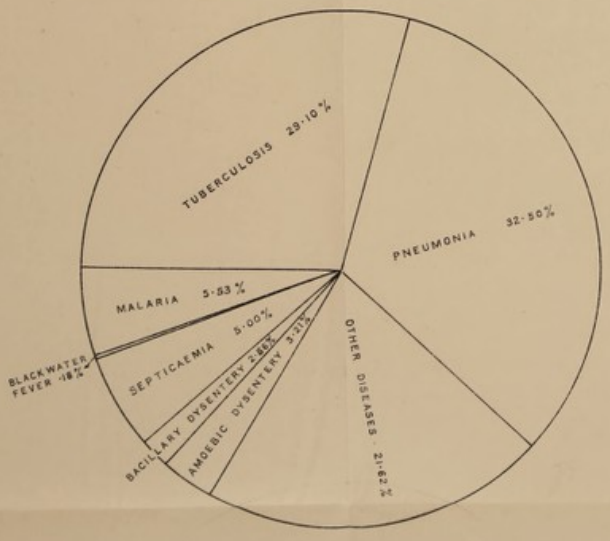


GENERAL SYSTEMIC AND PREVENTABLE DISEASES TOTAL INCIDENCE 240056.

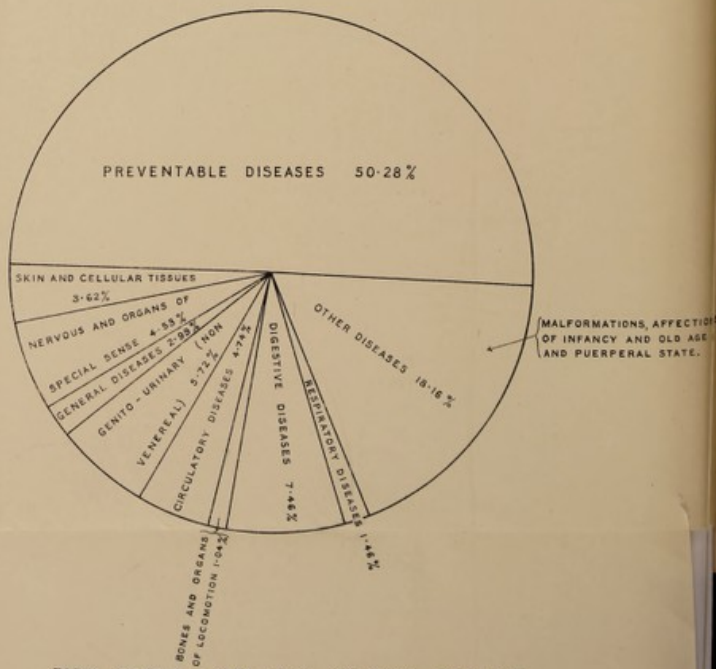


PREVENTABLE DISEASES ARE

(1) INFECTIOUS DISEASES
(2) INTOXICATION AND POISONS
(3) SCABIES AND TINEAE
(4) HELMINTHS
(5) AFFECTIONS PRODUCED BY EXTERNAL CAUSES.



TOTAL DEATHS = 560 = ·58% OF TOTAL INCIDENCE.



TOTAL DEATHS = 1434 = ·59% OF TOTAL INCIDENCE.

SURVEY H.Q. ACCRA, 1933.

4. The total Ordinary (i.e. Recurrent) Expenditure for Medical Services (all branches) was £285,110 as compared with £320,144 in 1931–32. This figure is exclusive of the cost of buildings, e.g. hospitals, dispensaries, etc., and other public health works such as water supplies, town improvements, etc.

5. The ratio of the Ordinary Expenditure on Medical Services, to the Total Expenditure of the Colony, was 10.76 per cent as compared with a ratio of 11.85 per cent last year. The 1.1 per cent difference represents a large sum lost.

6. A detailed Financial Statement for the year appears at Table II of the Returns.

7. The following table shows the Ordinary (Recurrent) Expenditure under the Heads Medical, Health and Research over five years, as compared with the total Ordinary (Recurrent) Expenditure for the Colony :—

Branch.	1928–29 (Actual).	1929–30 (Actual).	1930–31 (Actual).	1931–32 (Actual).	1932–33 (Actual).	1933–34 (Estimated).
	£	£	£	£	£	£
Medical	173,147	190,083	195,450	166,572	155,248	159,959
Health	119,427	151,123	154,986	139,083	121,714	121,530
Research	14,230	17,088	18,647	14,489	8,148	7,025
Total	306,804	358,294	369,083	320,144	285,110	288,514
Total (Colony)	2,553,423	2,692,012	2,872,385	2,700,469	2,647,486	2,508,652
Percentage of total to Colony Total	12%	13.3%	12.84%	11.85%	10.76%	11.5%

II.—PUBLIC HEALTH.

(*a*) General Remarks.

8. The following table shows the most noteworthy contrasts in the returns of diseases treated by the Medical branch during the years 1930–31, 1931–32, and 1932–33 :—

Diseases.	1930–31.		1931–32.		1932–33.	
Small-pox	25		3		5	
Varicella (chicken-pox)	211		534		516	
Dysentery :—						
(*a*) Amœbic	735		717		701	
(*b*) Bacillary	313	1,273	183	1,143	143	1,078
(*c*) Undefined or due to other causes ...	225		243		234	
Enteric Group :—						
(*a*) Typhoid fever	55		23		62	
(*b*) Para-typhoid A	6		3		6	
(*c*) Para-typhoid B	3	71	3	35	3	75
(*d*) Para-typhoid C	—		1		—	
(*e*) Type not defined	7		5		4	
Influenza	396		1,257		566	
Malaria :—						
(*a*) Tertian	1,946		1,610		693	
(*b*) Quartan	53		40		47	
(*c*) Æstivo-autumnal	9,366	12,930	7,396	10,484	8,584	11,327
(*d*) Cachexia	334		215		145	
(*e*) Blackwater	18		28		13	
(*f*) Unclassified	1,213		1,195		1,845	
Measles	303		310		133	
Pneumonia :—						
(*a*) Broncho-pneumonia	305		798		236	
(*b*) Lobar pneumonia	682	1,199	524	1,456	532	886
(*c*) Unclassified	212		134		118	
Trypanosomiasis (sleeping sickness)	224		250		685	
Whooping cough	517		374		346	
Alcoholism	22		11		14	
Yellow fever	2		26		4	
Tuberculosis :—						
(*a*) Pulmonary and laryngeal	916	1,149	962	1,180	968	1,158
(*b*) Other forms	233		218		190	
Plague :—						
(*a*) Bubonic	—		—		—	
(*b*) Pneumonic	—		—		—	
(*c*) Septicæmic	—		—		—	
(*d*) Undefined	—		—		—	
Ankylostomiasis	184		179		299	

COMPARATIVE FIGURES FOR FIVE YEARS, 1928–29, 1929–30, 1930–31, 1931–32, 1932–33, FOR ALL PATIENTS TREATED IN HOSPITALS AND DISPENSARIES OF THE MEDICAL BRANCH INCLUDING ASYLUM FIGURES FOR 1932–33.)

Year.	Remaining in hospital.	Total cases treated (in and out-patient).	Deaths.	Remaining in hospital.	Percentage of deaths to total patients treated.
1928–29 ...	601	177,594	1,009	678	.57
1929–30 ...	678	184,424	1,156	849	.63
1930–31 ...	786	213,708	1,176	816	.55
1931–32 ...	816	198,205	1,186	811	.59
1932–33 ...	811	206,870	1,210	1,220	.58

HEALTH OF THE GENERAL EUROPEAN COMMUNITY.

9. The general health of the European community was satisfactory. Compared with previous years there was a clear improvement, which will be evident from a reference to the Vital Statistics No. 9 table on page 12.

10. The death rate amongst the officials was low, being only .1 per cent of the total number resident. The invaliding rate remained about the same as in previous years.

11. There were no epidemics during the year to affect the general health and, although the percentage of sick to the average number resident was about the same as in previous years for officials and non-officials, yet disease did not take a heavy toll of lives; for example, blackwater fever accounted for not a single death, while in former years the average mortality rate worked out at between 20 per cent and 30 per cent.

HEALTH OF THE GENERAL AFRICAN COMMUNITY.

12. The health of the general African community has not been unsatisfactory, although African officials did not appear to enjoy as good health as in previous years. There was more sickness amongst this class. The invaliding rate rose from 0.60 per cent last year to 1.10 per cent and a small increase occurred in the death rate.

13. The poorer labouring classes in the towns especially suffered much on account of general unemployment due to the financial depression. This fact has undoubtedly had an adverse influence on their health.

14. Although the cases treated in the hospitals and dispensaries of the Medical branch show an increase on last year's figure, they show a fall when compared with the 1930–31 figures. This fall does not indicate that there is less sickness; it is due chiefly to two factors, viz., the greatly depleted medical staff who are physically unable to deal with the numbers of cases coming forward, and the inability of the majority of the people to travel owing to lack of money. Moreover, in certain areas where stations have been closed down, greater distances must be covered by patients seeking treatment.

15. Generally speaking, medical services although contracted have maintained a high standard of efficiency. The following table gives the numbers of patients seen during the past eight years with the percentage increase or decrease, as the case may be, on the previous year:—

Year.	Total cases treated in hospitals and dispensaries by Medical branch alone.	Percentage increase or decrease on previous year.
1925–26	97,910	—
1926–27	105,300	+ 7.5
1927–28	133,069	+26.42
1928–29	177,594	+32.65
1929–30	184,424	+ 3.84
1930–31	213,708	+15.88
1931–32	198,205	— 7.25
1932–33	206,870	+ 4.37

16. It will be seen that there is a definite increase in the numbers as compared with last year, and this increase is due to more patients having been seen by the Medical branch ; the Health branch figures show a decrease.

17. The following table shows the actual numbers of medical officers of the West African Medical Staff below the rank of Senior Medical Officer during the past four years, and as authorized for the year 1933–34. The authorized establishments appear in brackets.

	1929–30	1930–31	1931–32	1932–33	1933–34
Medical officers	42 (46)	39 (42)	33 (33)	35 (35)	(35)
Medical Tutor ... ... (Nurse-Dispenser scheme)	—	—	1 (1)	— (Post abolished) one M.O. added to staff of M.O.s.	—
Leprosy Officer (Local Secretary, British Empire Leprosy Relief Association).	1 (1)	1 (1)	1 (1)	— (One M.O. added to staff of M.O.s.)	—
Alienist Officer*	1 (1)	1 (1)	1 (1)	1 (1)	(1)
Total ...	44 (48)	41 (44)	36 (36)	36 (36)	(36)

**Note.*—This officer's functions were formerly performed by an ordinary Medical officer.

18. The increase in Medical branch work threw an added strain on the depleted staff of medical officers. A definitely increased sick rate occurred amongst them, probably in consequence.

19. There were no reliefs for those who fell ill, and continuity of work in various stations was often interrupted.

20. Medical officers have ceased to be stationed at Wioso, Kete Krachi, Kintampo and Mpraeso. Two travelling dispensaries have ceased to function and Bekwai is often closed.

I.—GENERAL DISEASES.

21. A return of diseases and deaths is shown in Table V, page 63 to 72.

Malignant diseases.—One hundred and twenty-six malignant tumours were seen as compared with 100 in 1931–32.

Deficiency diseases were not very noticeable. What was believed to be a deficiency disease amongst prisoners and which appeared regularly in former years was absent during 1932–33, due most probably to a change effected in the diets.

II.—COMMUNICABLE DISEASES.

(1) Mosquito or Insect-borne.

Malaria.

22. Malaria continues its toll on the health and lives of all classes. It is one of the chief causes of infantile mortality, and of sickness and invaliding amongst Europeans. The incidence does not vary much from year to year, and the percentage of all cases treated remained between 5 per cent and 6 per cent. A valuable practical note by Dr. C. D. Williams, Woman Medical Officer, on the treatment of malaria in children appears at Appendix 9.

23. The following Table, which should be read in conjunction with Table 3 on page 10, shows the percentage of all cases treated over a period of five years :—

	1928–29	1929–30	1930–31	1931–32	1932–33
Total treated	10,002	10,562	12,930	10,484	11,327
Percentage of all cases treated	5.63	5.73	6.05	5.29	5.48

Blackwater Fever.

24. During the year under review the incidence and case mortality of Blackwater amongst Europeans were noteworthy, being probably the lowest recorded. Only five cases occurred amongst 2,959 Europeans resident, and there were no deaths.

25. The following table allows a comparison to be made with the figures of previous years :—

Period.	Percentage of cases in Europeans to total European residents.	Percentage of deaths to cases.
Five year period 1917–21 ...	.89	35.3
Five year period 1923–28 ...	.47	23.7
1928–29	.16	16.6
1929–30	.40	13.33
1930–31	.42	13.33
1931–32	.62	21.05
1932–33	.17	0.0

26. The following table showing the incidence of and deaths from Blackwater fever in each race for the past three years is of interest :—

	1930–31		1931–32		1932–33	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Europeans	15	2	19	4	5	0
Syrians	1	0	3	1	3	1
Indians	0	0	0	0	0	0
Africans	2	2	6	3	5	0

Trypanosomiasis.

27. During the past year there has been a rapid increase in the number of trypanosomiasis cases reported and treated, the incidence per 10,000 of all cases treated having risen from 6.56 in 1929–30 to 33.11. Last year the figure was 12.61.

Year.	Cases.	Deaths.	Incidence per 10,000 of all cases treated.	Percentage of deaths to cases.
1927–28	59	4	4.43	6.78
1928–29	94	18	5.29	19.14
1929–30	121	23	6.56	19.00
1930–31	224	16	10.47	7.14
1931–32	250	28	12.61	11.2
1932–33	685	45	33.11	6.57

28. It might be considered that this is not an alarming rate, but it may be a definite warning that the disease has spread. On the other hand, the increase may be due to better diagnosis with consequential better treatment leading in its turn to increased attendances.

29. It would appear to be concentrated chiefly in a few areas, the most important being the Nakpanduri-Bende area of Northern Togoland close to the French frontier and east of Gambaga in the Northern Territories. Another area in which cases appear to be increasing is the Sunyani district in Ashanti.

30. The French are anxious at the increase in their territory and have organised treatment centres on a large scale in order to deal with the problem.

31. At the invitation of the French, who desired to co-operate, the Medical Officer, Bawku, visited their treatment centres at Mango and Pagouda.

32. It was decided that we should co-operate in a treatment campaign as far as our limited funds would permit. At the same time it was considered wise to intensify bush clearing in affected areas in order to reduce fly. It is believed that by a combination of these two lines of attack good results will be achieved.

33. The Political Administration is assisting in the work, and the following measures are receiving special attention :—

(*a*) The clearing and keeping clear of a 50 yard belt round villages, to be extended ultimately to 100 yards.

(*a*) The clearing and keeping clear similarly of
(i) The principal water holes of the villages.
(ii) The principal fords ; and

(*c*) The keeping of cattle in kraals outside of, instead of in the middle of the villages.

34. All medical officers are supplied with as much Bayer 205 and Tryparsamide as funds will allow.

Yellow Fever.

35. There has been no epidemic of yellow fever during the year. Three cases in Africans were reported, one from Tamale and two from Sekondi. The Sekondi cases both died.

2.—Infectious Diseases.

Smallpox.

36. There were five cases of smallpox reported and no deaths.

Dysentery.

37. There were 1,078 cases recorded as compared with 1,143 for last year. There were 36 deaths, giving a case mortality of 3.3 per cent.

38. The following table gives the case incidence and case mortality over the last five years.

Year.	Case incidence.	Case mortality.
	Per cent.	Per cent.
1928–29	.92	2.9
1929–30	.84	2.4
1930–31	.54	3.1
1931–32	.57	3.5
1932–33	.52	3.3

Enteric Group.

39. The numbers in this group have risen to 75 as compared with 35 in the previous year. It was decided to circularize all Europeans every six months informing them of the value of anti-typhoid inoculation.

Pneumonia.

40. There was a reduction in the number of cases of pneumonia, but the case mortality increased from 10 per cent to 16 per cent which is above the average for the last five years. There is no assignable reason for the increased mortality figure.

Year.	Case incidence.	Case mortality.
	Per cent.	Per cent
1928–29	.87	11.3
1929–30	1.47	6.1
1930–31	.56	12.01
1931–32	.73	10.09
1932–33	.43	16.25

Tuberculosis.

41. The incidence of tuberculosis remains fairly constant and for the last five years there has been very little variation in the incidence reported.

42. The following table shows the number of cases seen and the case incidence over a number of years :—

Year.	Number of cases.	Case incidence per cent of all cases treated.
1923–24	411	.53
1924–25	414	.50
1925–26	571	.58
1926–27	698	.66
1927–28	910	.68
1928–29	1,151	.65
1929–30	1,175	.64
1930–31	1,149	.54
1931–32	1,180	.59
1932–33	1,158	.56

43. This disease is centred chiefly in the mining areas in the Colony. At present death registration is confined to about 30 towns, and a true figure for the Colony cannot be returned. There is no evidence of an increased incidence in the manifest disease.

44. At Appendix 3 is a very interesting note by the Medical Officer, Saltpond, on the incidence of tuberculosis among the African community.

45. He employed the intra-cutaneous tuberculin test of Mantour ; just over a thousand persons were tested, and the results indicate that tuberculisation is widespread.

Venereal Diseases.

46. Cases treated during the year are shown below together with those of the previous four years.

	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.
Gonorrhoea	4,809	4,110	4,059	3,270	3,833
Syphilis	3,434	1,553	1,018	621	768
Chancroid	419	431	235	318	200

47. The following table shows the percentage of gonorrhoea, syphilis, and yaws of the total of all diseases treated by the Medical branch over a period of five years. The numbers for gonorrhoea and syphilis show a slight increase on last year's figures.

	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.
Gonorrhoea	2.85	2.24	1.90	1.64	1.85
Syphilis	1.58	.86	.47	.31	.37
Yaws	24.68	22.82	26.54	26.37	27.18
All other diseases	70.89	74.18	71.09	71.68	70.60

Leprosy.

48. At Appendix 5 is a short report on the Leper Settlement at Ho.

49. No new buildings were erected during the year. The existing buildings are in fairly good repair and are sufficient for the needs of the inmates.

50. The Mission of the White Fathers at Navrongo maintains a small settlement there and useful work is accomplished.

51. The old difficulty of maintaining regular treatment in stations outside the Ho and Accra Leper Settlements still exists. Medical officers from various centres throughout the Colony report that they are unable to persuade lepers to continue treatment for any length of time.

52. Numbers of cases were reported from various places such as Bawku, Lawra, and Sunyani.

53. The Medical Officer, Lawra, reported that the disease was prevalent throughout his district and caused much disfigurement but few cases came forward for treatment.

54. As pointed out in previous reports the problem of leprosy is bound up with the general problem of raising the whole standard of living of the tribes chiefly affected. Expenditure on it is limited by its relative importance to other more pressing problems and the Colony's financial resources.

Ascaris.

55. Ascariasis continues to cause much sickness especially amongst children. The figure appearing in the present report is a definite increase on last year.

56. The number reported does not give a true indication of the prevalence of this infection. In most cases it is discovered when the patient consults the doctor for some other complaint.

Dracontiasis.

57. One thousand three hundred and thirty two cases of guinea worm were seen during the year, but the figure does not give a true indication of its prevalence, as many patients prefer to apply their own mode of treatment and only report to a doctor when large ulcers are formed.

Yaws.

58. For the last four years there has been a tendency for Yaws figures to increase.

59. In 1929 yaws claimed 22.82 per cent of all cases treated by the Medical branch, and for the period under review the percentage stood at 27.18. It is difficult to explain this increase. It is not due to an intensive yaws campaign in any district ; the increase is general throughout the Colony.

60. In the Northern Territories the percentage of yaws of all cases treated is as high as 58. The percentage is always high in the remoter rural areas.

61. During the past two years B.S.T. injection has been the main method of treatment. The advantage of B.S.T. is its cheapness which is particularly appreciated during the present financial depression. Most medical officers are agreed that this drug, although valuable, does not effect a permanent cure, and that there are many relapses after treatment. This would explain to some extent the increase in numbers treated. The relief, often dramatic, from pressing symptoms is also bound to be a factor in increased attendances.

Ulcers.

62. There was again a reduction in the figures for ulcers throughout the Colony.

Rabies.

63. There was no case of human rabies reported during the year, but anti-rabic vaccine has been used freely on persons bitten by mad dogs. Regular supplies are received from England at frequent intervals in order that fresh vaccine may always be available.

64. A small outbreak of canine rabies was reported from Akuse, but no humans were infected.

(5) VITAL STATISTICS.

General European Population.

1.—Table shewing actual number of residents.

	1930–31.	1931–32.	1932–33.
(i) Government officials	1,313	1,076	941
(ii) Employees of trading firms	1,519	1,365	1,310
(iii) Employees of Mining Companies ...	453	371	450
(iv) Missionaries	223	235	258
Total	3,508	3,047	2,959

Compared with the previous year there was a decrease of 135 Government officials and a decrease of 47 non-officials.

A.—EUROPEAN OFFICIALS.

2.—Table shewing sick, invaliding and death rates for past three years.

	1930–31.	1931–32.	1932–33.
Total number of officials resident	1,313	1,076	941
Average number resident	936	819	639
Total number on the sick list	799	752	529
Total number of days on sick list	7,961	6,755	5,183
Average daily number on sick list	21.81	18.45	14.2
Percentage of sick to average number resident ...	2.32	2.25	2.22
Average number of days on sick list for each patient	9.96	8.98	9.79
Average sick time to each resident	8.50	8.25	8.11
Total number invalided	49	58	36
Percentage of invalidings to total residents	3.73	5.39	3.83
Percentage of invalidings to average number resident	5.22	7.08	5.63
Total deaths	3	7	1
Percentage of deaths to total residents	0.22	0.65	.10
Percentage of deaths to average number of residents	0.32	0.85	.15
Number of cases of sickness contracted away from residence	Not available	Not available	Not available.

3.—Table shewing total days sick with special reference to malaria.

Year.	Average No. resident.	Total sick days.	Total days on sick list for malaria.	Total days on sick list for other diseases.	Percentage of days lost through malaria to total days lost.	No. of days lost through malaria for the year per 100 residents.
1924–25 ...	680	8,614	1,746	6,868	20.26	256
1925–26 ...	761	6,108	1,547	4,561	25.32	203
1926–27 ...	783	6,847	1,204	5,643	17.58	153
1927–28 ...	835	7,023	1,530	5,493	21.81	183
1928–29 ...	881	7,177	1,661	5,516	23.14	188
1929–30 ...	972	7,795	1,920	5,875	24.63	197
1930–31 ...	936	7,961	1,610	6,351	20.22	172
1931–32 ...	819	6,755	1,381	5,374	20.44	168
1932–33 ...	639	5,183	1,056	4,127	20.37	165

Separate records of Invalidings and Deaths have been kept for Class "A" and Class "B" officials, and the table is given below.

4.—Table contrasting invaliding rates of "A" and "B" officials.*

	Class "A."				Class "B."			
Year.	Average number resident.	Invaliding.	Rate per 1,000.	Rate per cent.	Average number resident.	Invaliding.	Rate per 1,000.	Rate per cent.
1930–31 ...	653	36	55.13	5.51	283	13	45.93	4.59
1931–32 ...	598	32	53.51	5.35	221	26	117.64	11.76
1932–33 ...	471	27	57.32	5.73	168	9	53.57	5.36

5.—Table analysing invalidings by residental service and leave conditions.

Serving under.	Under 6 months.	6 but under 9	9 but under 12	12 but under 15	15 but under 18	18 months and over.	Total.
Old Leave Regulation	—	1	—	—	—	—	1
New Leave Regulation	5	4	12	6	7	1	35

6.—Table contrasting the death rates of "A" and "B" officials.*

	Class "A."				Class "B."			
Year.	Average number resident.	Deaths.	Death rate per 1,000.	Death rate per cent.	Average number resident.	Deaths.	Death rate per 1,000.	Death rate per cent.
1930–31 ...	653	3	4.59	.46	283	—	—	—
1931–32 ...	598	2	3.34	.33	221	5	22.62	2.26
1932–33 ...	471	—	—	—	168	1	5.95	.59

*This classification no longer exists but is retained here for convenience of description. Class "A" refers to officers whose salary or the maximum of whose scale of salary is not less than £600 per annum Class "B" includes all other officers.

7.—Table shewing invaliding and death rates over ten year period based on the average number resident.

Year.	Average number resident.	Total invalided.	Percentage invalided.	Total died.	Percentage died.
1923–24	689	32	4.65	10	1.45
1924–25	680	58	8.52	7	1.02
1925–26	761	59	7.75	8	1.05
1926–27	783	49	6.26	3	.38
1927–28	835	39	4.67	6	.71
1928–29	881	50	5.67	4	.45
1929–30	972	49	5.04	5	.51
1930–31	936	49	5.22	3	.32
1931–32	819	58	7.08	7	.85
1932–33	639	36	5.63	1	.15
Average for the period ...	799.5	47.9	6.05	5.4	.69

Causes of **Invalidings** of European officials during the period 1932–33.

Psycho-neurosis	5	Visceroptosis	1
Blackwater fever	2	Tumour	2
Debility	6	Pes Planus	1
Gout	1	Wounds	3
Asthma	1	Dementia paranoides ...	1
Hepatitis	1	Nephritis	2
Alcoholism	1	Yellow fever	1 (onset in previous year).
Pyrexia (unknown origin) ...	1	Fracture	1
Arterio-sclerosis	1	Duodenal ulcer	1
Influenza	1	Trypanosomiasis ...	1
Empyema	1	Osteoarthritis	1

Total 36.

Of the 36 officials invalided none was military.

Causes of **Deaths** of European officials during the period 1932–33.

Cardiac Syncope 1

B.—EUROPEAN NON-OFFICIALS.

8.—Table shewing invaliding and death rates for the past three years.

(*N.B.*—Wives of officials appear under Merchants, Females).

1930–31.		Number.	Deaths.	Invalided.	Death rate per cent.	Invaliding rate per cent.
Merchants	Males	1,139	9	17	.79	1.49
	Females	380	1	4	.26	1.05
Mining Companies	Males	438	5	7	1.14	1.59
	Females	15	—	—	—	—
Missionaries	Males	135	—	6	—	4.44
	Females	88	—	—	—	—
Totals		2,195	15	34	.68	1.54
1931–32.						
Merchants	Males	935	12	13	1.28	1.39
	Females	430	2	6	.46	1.39
Mining Companies	Males	357	3	12	.84	3.35
	Females	14	—	—	—	—
Missionaries	Males	142	1	7	.70	4.92
	Females	92	—	5	—	5.37
Totals		1,971	18	43	.91	2.13
1932–33.						
Merchants	Males	903	3	14	.33	1.55
	Females	407	—	3	—	.74
Mining Companies	Males	428	3	9	.70	2.10
	Females	22	—	—	—	—
Missionaries	Males	155	1	7	.64	4.51
	Females	103	2	2	1.94	1.94
Totals		2,018	9	35	.45	1.73

9.—Table shewing invaliding and death rates over ten year period based on total number resident and contrasting with officials.

	Non-Officials.			Officials.		
Year.	Total number resident.	Percentage Invalided.	Percentage died.	Total number resident.	Percentage Invalided.	Percentage died.
1923–24 ...	2,049	2.68	.68	994	3.21	1.00
1924–25 ...	2,020	3.26	.59	846	6.85	.82
1925–26 ...	2,110	3.12	.66	994	5.93	.80
1926–27 ...	2,435	2.66	.94	1,046	4.68	.28
1927–28 ...	2,375	2.02	.88	1,202	3.24	.49
1928–29 ...	2,328	1.33	.94	1,280	3.90	.31
1929–30 ...	2,370	2.11	.80	1,323	3.70	.37
1930–31 ...	2,195	1.54	.68	1,313	3.73	.22
1931–32 ...	1,971	2.13	.91	1,076	5.39	.65
1932–33 ...	2,018	1.73	.45	941	3.83	.10
Average for the period ...	2,187.1	2.25	.75	1,101.5	4.45	.50

Causes of **Invalidings** of Non-Officials during the Period 1932–33.

Malaria	5	Blackwater fever	2
Debility	2	Psychoneurosis	4
Pregnancy	2	Gastritis	1
Pulmonary tuberculosis	3	Chronic bronchitis	2
Septicæmia	1	Silicosis	1
Pyelitis	1	Renal calculus	1
Fracture	1	Appendicitis	1
Duodenal ulcer	2	Boils	1
Diabetes	1	Periostitis	1
Conjunctivitis	1	Eczema	1
Typhoid	1		

Total 35

CAUSES OF **Deaths** OF NON-OFFICIALS DURING THE PERIOD 1932–33.

Malaria	1	Broncho-pneumonia	1
Duodenal ulcer	1	Septicæmia	1
Peritonitis	1	Typhoid	1
Dysentery	1	Cardiac syncope	1
Cancer	1		

Total 9.

C.—AFRICAN OFFICIALS.

10. TABLE SHEWING SICK, INVALIDING AND DEATH RATES FOR THE PAST THREE YEARS.

	1930–21.	1931–32.	1932–33.
Total number of officials resident	4,775	4,994	3,386
Average number resident	4,451.02	4,576.4	3,095.5
Total number on sick list	1,175	1,316	1,045
Total number of days on sick list	12,691	14,190	12,199
Average daily number on sick list	32.03	33.77	33.42
Percentage of sick to average number resident	0.72	0.84	1.08
Average number of days on sick list for each patient ...	10.80	10.78	11.67
Average sick time to each resident	2.85	3.10	3.94
Total number invalided	37	30	34
Percentage of invalidings to total residents	0.77	0.60	1.00
Percentage of invalidings to average number resident ...	0.83	0.65	1.10
Total deaths	11	16	12
Percentage of deaths to total residents	0.23	0.32	.35
Percentage of deaths to average number resident	0.25	0.34	.39
Number of cases of sickness contracted away from residence	Not available	Not available	Not available

CAUSES OF **Invalidings** OF AFRICAN OFFICIALS DURING THE PERIOD 1932–33.

Chronic nephritis	1	Cardiac incompetence	3
Senility	2	Psychoneurosis	3
Chronic bronchitis	1	Cranial syphilis	4
Chronic arthritis	2	Primary optic atrophy	1
Pulmonary tuberculosis	4	Arterio-sclerosis	1
Delusional insanity	1	Malignant tumour	2
Perineal fistula	2	Pleurisy	1
Hemiplegia	1	Tuberculosis (generalised) ...	3
Debility	2		

Total 34.

CAUSES OF **Deaths** OF AFRICAN OFFICIALS DURING THE PERIOD 1932–33.

Pneumonia	4	Violent death	1
Typhoid	2	Poisoning by corrosive sublimate	1
Amœbic dysentery	1	General peritonitis	1
Perforated duodenal ulcer ...	1	Cellulitis	1

Total 12.

D.—GENERAL AFRICAN POPULATION.

65. The population at the 1931 Census was 3,160,386, a remarkable increase of 37.5 per cent on the figure for 1921.

66. It is impossible to calculate the birthrate for the Colony as a whole owing to the fact that registration only extends to some 30 of the principal towns.

67. For the purpose of comparison with previous years, particulars are given in the following table of births, deaths and the infant mortality rate at six of the principal and most populous centres in the Colony and Ashanti.

68. During the year 1932, births and deaths registered in the Colony and Ashanti numbered 9,376 and 5,905 compared with 8,239 and 5,972 respectively for 1931.

11. Table showing Births, Deaths and the Infant Mortality Rate at Six Principal Towns.

Station.	1928.			1929.			1930.			1931.			1932.		
	Births.	Deaths.	Infant mortality rate.	Births.	Deaths.	Infant mortality rate.	Births.	Deaths.	Infant mortality rate.	Births.	Deaths.	Infant mortality rate.	Births.	Deaths.	Infant mortality rate.
Accra	1,919	1,309	150	2,576	1,293	135	2,599	1,250	112	2,901	1,299	95	2,576	1,282	1 7
Kumasi...	584	554	113	742	642	125	774	727	124	952	805	120	96	658	115
Cape Coast	255	363	121	460	311	63	552	317	61	489	319	85	480	359	83
Sekondi	207	314	77	253	279	110	289	291	114	242	236	95	400	209	42*
Koforidua	420	205	90	513	253	124	345	402	208	365	289	153	450	272	95
Tarkwa	43	118	209	71	123	112	65	144	200	44	179	340	91	192	208
Total	3,428	2,863	—	4,615	2,901	—	4,624	3,131	—	4,993	3,127	—	4,958	2,972	—

*This figure is unreliable.

III.—HYGIENE AND SANITATION.

A.—General Review of Work done and Progress made.

I.—PREVENTIVE MEASURES.

(i) *Mosquito and Insect-borne Diseases.*

(a) Malaria.

69. Malaria remains the most general and most extensive problem to be faced by the Health branch. It is the largest pre-disposing factor of mortality and morbidity among the young, the chief cause of labour inefficiency and "lost-time," and complicates a large percentage of pathological processes from birth to old age.

70. Anopheles gambiæ is the chief transmitting factor. The extensive breeding-grounds open to this very adaptable mosquito, both in the coastal and rural areas, readily accounts for the immensity of the problem. If Anopheles gambiæ favours the more exposed water collections, its able ally Anopheles funestus prevails over the more sheltered areas. Indiscriminate clearing of heavy "bush," sheltered in turn by forest trees in very swampy areas is to be guarded against. It is not easy to demonstrate anopheline larvæ in swampy areas heavily shut-in by thick "bush" and forest. When such swampiness extends beyond its normal limit, as the result of heavy rain, and reaches lightly shaded areas and areas of open grassland, the story is a different one. Great care is, therefore, exercised in not opening out a larger area than can effectively be dealt with by canalisation, "herringboning," the provision of contour drains, etc. Not enough stress, it is thought, has been laid in the past on sub-soil methods of drainage in the Gold Coast.

71. During the period under review very little permanent drainage has been accomplished, but rarely has so much been done in many localities by way of filling low-lying land liable to swamp, or by drainage by means of earth-gutters fed by "herringbone" collaterals. Good work has been done in Accra, Kumasi, Sekondi, Axim, Koforidua, Nsawam, Cape Coast, Tamale and elsewhere.

72. Koforidua and Nsawam can be taken as typically malarious stations. During the rains extensive low-lying areas become swamps. Owing to the "banking-up" of the streams this swamp-water cannot run off. In addition spill-water from the natural waterways escapes, and further increases the swampiness. The lines of natural drainage lack fall. Surface drainage of the higher areas is no cure, as it only runs more water into areas from which there is no possible outlet. The former of the two above-mentioned stations is in the forest-belt. The other is situated where forest and coastal plain meet.

73. Tamale is representative of a malarious station situated in open rolling country. The facilities for anopheline breeding in the wide shallow valleys in its vicinity during the rains can hardly be surpassed. These valleys have little natural fall. They do not radiate from the higher ground on which the town is built, but tend to run concentrically. If drainage were attempted, the work would have to be extended for miles before any amelioration of the mosquito menace in the town itself could possibly result.

74. Anti-malarial measures undertaken during the year may be summarised briefly as follows:—

(1) The filling of low-lying swamp land, borrow-pits, water holes, etc., when of limited extent, and when filling material is available.

Incombustible refuse is often used for the purpose, e.g. flattened tins and smashed bottles, old motor parts, etc., covered with a well rammed top dressing of earth.

(2) Areas allowing for sufficient fall have been drained by the cutting of earth-drains fed by "herringbone" collaterals, which may either be "open" or "sub-soil."

(3) The treatment of standing-water, in areas impossible to drain or fill, by means of anti-malarial oil or Paris green and incinerator ash mixture.

(4) Suitable collections of water have, in some instances been stocked with larvæ-eating top-minnows.

(5) The clearing of grass and bush in the vicinity of houses.

(6) Propaganda in its widest terms, with special reference to personal protection by nets, boots, etc., and the prophylactic taking of quinine.

(7) The treatment, i.e. sterilisation as far as possible of the blood of cases of malaria in hospitals, dispensaries and infant clinics.

75. The splenic rates in children examined at five important centres are as follows :—

TABLE I.

	Percentage with enlarged spleens.
Accra	15.8
Takoradi	24.7
Sekondi	22.5
Cape Coast	20.5
Koforidua	27.1

76. The mosquito-proofing of bungalows, if personal care can be assured, is a most valuable method of prevention. The lack of sufficient interest on the part of the bungalow occupier and the low standard of domestic service are two great drawbacks. Mosquito-proofing of bungalows which have not been designed with this object in view is often a most difficult and expensive undertaking. Particulars of quarters mosquito-proofed either completely or partially are given below :—

TABLE II.

Province	Total Permanent Quarters.	Total Temporary Quarters.	Total "Bush" Quarters.	Numbe partly protected	Number completely protected.
Accra	254	4	—	22	—
Eastern	91	2	—	3	—
Central	51	13	3	—	—
Western	112	10	5	10	14
Ashanti	152	—	2	3	—
Northern Territories	42	22	1	24	—
	702	51	11	62	14

(*b*) Yellow Fever.

77. During the year 1932–33 three cases of yellow fever were reported. The first case occurred early in the year in Tamale the principal town in the Northern Territories. This case recovered. Towards the end of the year two cases occurred in the Western Province of the Colony ; one in Sekondi, and the other in a village about 14 miles west of that town. These two cases proved fatal.

78. The incidence of yellow fever from 1921 to 1932 is given in Table III, below :—

TABLE III.

Year.	Cases.	Deaths.	Percentage mortality.
1921	4	4	100.0
1922	10	8	80.0
1923	19	16	84.2
1924	8	6	75.0
1925	7	4	57.1
1926	65	18	27.7
1927	107	40	37.4
1928	2	2	100.0
1929	—	—	—
1930	2	1	50 0
1931	17	12	70.6
1932	4	—	—

79 Previously town areas where the breeding of domestic mosquitoes was well controlled were viewed with a certain amount of equanimity. Odd cases of yellow fever were possible and did occur, but the possibility of epidemic spread of the disease was not anticipated. Owing to recently acquired knowledge the position appears more disquieting and the question may be asked—" can proved laboratory ' carriers ' of yellow fever transmit the disease under natural conditions " ? The natural carrier is Aedes aegypti. If culex thalassius, among others, is also such the problem becomes more grave. Culex thalassius is probably as common as any other culicine mosquito in Accra throughout the year.

80. The average village (and the majority are of necessity uninspected with regard to the breeding of domestic mosquitoes), will show a larval index of anything between 20 per cent and 100 per cent. Control needs to be extended. Round most town boundaries is a ring of villages not under the Towns Ordinances nor under the Mosquitoes' Ordinance. In these little if anything can at present be done. The larval index of many of these is known to approach 100 per cent. They may be only a few feet outside the town boundary. It would be well if all villages lying within a zone of, say, three miles round the boundaries of the larger centres were under the Mosquitoes' Ordinance. The existing law under which mosquito control is carried out would appear to require some revision. It is cumbersome from the practical point of prevention and uncertain when invoked. The part played by yellow fever in the past history of the Gold Coast may be lost sight of by the community. No large epidemic has occurred since 1927. The outbreak at Tamale in 1931 occurred away from the large industrial centres. Occasional cases which appear from time to time do not keep the menace steadily before the public eye. Anti-mosquito activities on the part of the Health Branch gradually become more and more irksome to the public, less general assistance is forthcoming, until another outbreak with its attendant dislocation of trade and limitation of movement brings the problem once more to the forefront.

81. The racial incidence and case mortality of the cases which occurred during 1932–33 are to be found in Table IV.

TABLE IV.

	Colony.			Ashanti.			Northern Territories.		
	Cases.	Deaths.	Mortality.	Cases.	Deaths.	Mortality.	Cases.	Deaths.	Mortality.
			Per cent.			Per cent.			Per cent.
African.									
Males ...	1	1	100	—	—	—	1	—	—
Females ...	1	1	100	—	—	—	—	—	—
Total	2	2	100	—	—	—	1	—	—

82. No cases occurred among Europeans or Syrians during the year.

83. Preventive measures undertaken against yellow fever may be briefly summarised as follows :—

(1) Well organised and supervised unremitting, house-to-house inspections in areas where such close control is practicable. In suspected endemic rural areas as careful a watch as possible has been kept on the smaller towns and villages. Owing to staff shortage control of the smaller centres and wide rural areas has been a matter of much difficulty. In the larger centres also it has become increasingly difficult to insure a weekly inspection of all premises. This desideratum which yielded a reliable larval index of the town or area represents now, in some instances, an index based on a smaller number of inspections only and not necessarily representing a full survey of the particular place.

(2) The encouragement of European susceptibles to live in residential areas reserved particularly for them. The artificial immunisation of all European officials and traders against yellow fever will probably be possible in the future but even this measure will not eliminate the necessity for well controlled residential areas. It is encouraging to note the increasing number of European trading firms which are taking up bungalows in the various residential areas for their staff.

(3) Much valuable information has been obtained from a survey directed by the West African (Rockefeller) Yellow Fever Commission, of endemic areas in Ashanti and the Northern Territories during the year.

(4) Particulars of the total results of house-to-house inspections by officers of the Health Branch throughout the Colony during the year are as shown in Table V.

TABLE V.

Number of inspections.	*Number of premises with larvæ.*	*Larval index.*
1,621,080	9,828	0.61

(*c*) FILARIASIS.

84. Filariasis in the Gold Coast is not a disease of great importance. Most stations report occasional cases, but nowhere is it a matter of moment. No special preventive measures are indicated.

(*d*) DENGUE.

85. Dengue, although sporadic cases occur now and again, has so far shown no tendency to assume epidemic proportions. Its chief claim to interest is the difficulty at times of its differential diagnosis from mild yellow fever. No special measures of control were adopted other than those already described in connection with the control of Aedes ægypti.

(*c*) TRYPANOSOMIASIS.

86. During 1932–33 a total of 48 deaths from trypanosomiasis were registered or 0.84 per centum of the total number of deaths registered. From the above figures neither the incidence nor the severity of the type of the disease would appear to render it a problem of urgent importance. But registration is not universal, and more cases are being seen annually by medical officers.

87. Certain districts in Ashanti and the Northern Territories to the north and the south of the Black Volta show a comparatively high rate of incidence, say, 3 per centum. And in certain limited areas a case incidence as high as 10 per centum has been recorded.

88. With the evidence at our disposal trypanosomiasis is a problem which at present does not demand a very large diversion of sorely needed and often inadequate funds, from more pressing items affecting the public health elsewhere. It is, however, one which cannot be disregarded. The Medical branch section of this report strikes a warning note.

89. Preventive measures consist of clearing round much used fords and watering-points, round townships, villages and residential areas. The previous standard of a 50 yards clearing has been shown by Saunders and Morris (1932) to be insufficient, and these workers advocate a clearing of not less than 100 yards. The majority of the cases reported were from Ashanti and the Northern Territories. Ashanti returned a total of 190 cases seen. Of this total 98 were diagnosed in Kumasi all of which were imported cases.

90. The Acting Senior Health Officer, Ashanti, remarks :—

> " Medical Officers appear to be diagnosing cases earlier than heretofore—such signs as mild paralysis of the facial muscles and cases of scabies, showing an alteration of habits, e.g. abstinence from regular washing, being regarded as suspicious."

91. Much yet remains to be done in anti-tse-tse clearing, particularly in the Northern Territories and Northern Togoland. Such clearing if progress is to be made must be done by the people themselves. Treatment alone, when possible, of all proved cases, is a method of proved value but it must be supplemented by clearings if results are to be lasting.

92. No area exists where removal of the population has yet had to be considered, but there is evidence that natural movements of population have, here and there, been influenced by the disease in the comparatively recent past.

2.—*Epidemic Diseases.*

(*a*) Plague.

93. No case of plague was reported during 1932–33. The menace, however, is real. Endemic plague exists in neighbouring administrations in the vicinity of our ports. At Takoradi ships come alongside the quay; the problem is therefore different from what existed formerly when all ports were open roadsteads and ships lay far-out.

94. Some 75,384 rats were caught and destroyed at ports and inland centres. A due proportion of the rats caught at the ports were subjected to bacteriological examination. During the year no plague-positive rat was found.

95. At the larger ports a good deal of rat-proofing of cacao-sheds, stores, etc., still requires completion.

96. Financial stringency renders such an ideal impossible at present. It is hoped to complete this important work when trade improves.

97. A reserve stock of plague vaccine is always kept on hand at Accra in case of emergency, in order to tide over the period between a possible outbreak and the establishment of regular supplies from the United Kingdom.

(*b*) Cholera.

98. So far cholera has never appeared on the Gold Coast. Preventive measures against this disease are the same as those enumerated under enteric.

(*c*) Smallpox.

99. During 1932–33 smallpox has been completely absent. A few doubtful cases were seen here and there but no case was definitely diagnosed.

100. Vaccination was the principal preventive method relied on.

101. Lanolinated lymph from the Lister Institute was used throughout the year. The cost of this was £2,379 13s. 11d.

102. The staff consists of 12 assistant public vaccinators posted at the places at which lines of immigration concentrate, viz. ports, ferries and populous centres of industry.

103. The results of their activities are as shown in Table VI.

TABLE VI.

	1931–32.	1932–33.
Total persons vaccinated	374,074	372,190
Number verified successful	102,129	118,679
Percentage successful	87.6	85.16

104. There is little doubt that the Colony is now profiting from the intensive vaccination campaign of 1929–30. During that year almost everybody in the Eastern Province of the Colony was protected.

(*d*) Enteric Fever.

105. During 1932–33 only four deaths were registered as due to the enteric group. Although this group does not figure largely in the list of fatal diseases, it is probably commoner among Africans than previously supposed. Among the clerk class mortality is high. The largest number of cases was reported from Accra, where 25 cases occurred with three deaths. It is probable that if financial depression continues the enteric group will increase in importance in populous

centres, where lack of funds may necessitate the provision of pit-latrines instead of pan-latrines as a method of night soil disposal. A pit-latrine, however well constructed and provided with lidded drop-holes and fly-traps, always tends to act as a " fly-nursery " to a greater or lesser degree.

106. Preventive methods comprised the cleanly disposal of night-soil and refuse, the protection of water-supplies and control of markets, active campaigns against flies and fly-breeding, and public health propaganda stressing the value of cleanliness in its broadest terms.

107. All Europeans both official and non-official, have been strongly advised to protect themselves by undergoing inoculation with T.A.B.C. vaccine at yearly intervals.

108. It is of interest to note that the majority of the Accra cases originated in an area of the town where there was a definite shortage of latrine accommodation at the time.

(*e*) Dysentery.

109. The disease group "dysentery, diarrhoea and enteritis" occupies third place in the list of fatal diseases, being surpassed only by the disease group " pneumonia, broncho-pneumonia and bronchitis," and by pulmonary tuberculosis.

110. During 1932–33 some 10 per centum of all deaths registered were due to this group. Amœbic dysentery is commoner than the bacillary type in about the proportion of two to one.

111. The centres returning the largest figures are, as a rule, those in backward areas and with defective water-supplies.

112. Preventive methods against this group of diseases are as mentioned in section (*d*) above.

(*f*) Cerebro-Spinal Fever.

113. No deaths from epidemic cerebro-spinal meningitis were recorded during the year. The cause of the absence of this disease of which a few cases usually occur annually in Ashanti and the Northern Territories may be climatic.

114. During 1932–33, the harmattan, when the coldest spells occur and when over-crowding to gain warmth takes place, was not severe.

115. Preventive methods may be summed up briefly in the prevention of overcrowding—a difficult task. It is not always easy to apply the relevant law and to insist on the provision of proper ventilation by the cutting of windows, and the substitution of the jalousie for the shutter.

116. The layout of townships and villages, and the application of the principles of town-planning are also important factors in control.

117. When cases do occur, care is taken not to herd contacts together for observation. If this is done a carrier may be rendered doubly dangerous. Contacts are much better employed in improving the sanitary conditions of the area in which the original case occurred, or in working in the open on their farms.

(*g*) Relapsing Fever.

118. This disease, owing for one reason at least to the possibility of confusing its diagnosis with that of yellow fever, must be treated with definite respect.

119. During the year it has not been so troublesome as in the past. In Accra, where cases usually occurred sporadically, it has been almost entirely absent. This is in all likelihood due to reduced immigration and the restricted travelling of itinerant labourers.

120. Kumasi had a smaller number of cases than usual, which occurred chiefly among the casual labourers who hang about the lorry-parks, etc., waiting to pick-up odd portering jobs.

121. During 1932–33, 14 cases in all were reported with two deaths.

122. Two disinfesting stations now exist on the Great North Road down which flows the annual stream of immigrant and Northern Territory labour.

123. The first station is situated at the junction of the Savelugu and Karaga Roads in the Tamale District. The second some 240 miles further south immediately on the outskirts of Kumasi. At these stations labourers passing south are bathed, shaved and have their clothing disinfested before being permitted to proceed on their way.

124. Other preventive methods consisted in the treatment of the sick with organic arsenicals and the delousing of contacts and of their clothing and other belongings.

125. Where possible the compounds which they occupied were also dealt with. Usually, however, sufferers and their contacts are homeless, and sleep in odd corners of the Kumasi Zongo. When cases begin to occur, early morning drives are organised, and the resulting " catch " of vagrants is disinfested by the hundreds.

126. The cases usually occur in tribesmen from French Territory, chiefly Zabramas, Gawos and Boweris.

(*h*) Yaws.

127. Yaws continues to form a large proportion of the out-patient cases attending hospitals, dispensaries and welfare clinics. It is, however, becoming more and more a disease of backward, rural areas, particularly in the Northern Territories and in northern Ashanti. In such places the water supply is often a serious problem and sanitation is very primitive.

128. In the larger centres yaws is now rarely met with, in contra-distinction to ten years or so ago when the condition was commonly met with in the streets of such a populous centre as Kumasi. Where medical aid is readily obtainable, and where sanitation has made progress, it is a declining disease.

129. No disease would appear to react more readily to general environmental sanitation.

130. Of the 29,521 cases dealt with as out-patients in the various clinics of the Health branch 4,828 or 16.4 per centum were yaws.

131. Prevention consists in the improvement of environmental sanitation in its broadest terms, with particular reference to refuse and night-soil disposal. The treatment of cases in the infective stages is also a most important factor.

OTHER DISEASES.

(*a*) Leprosy.

132. It is difficult to be sure of the true incidence of leprosy in the Gold Coast. Some 5,000 lepers were enumerated during the Census in April 1931, but this figure cannot be considered as conclusive for many reasons.

133. The above figures, such as they are, point to an incidence of about 1.5 per mille of the general population. A recent survey by the French of the Ivory Coast recorded 1.38 per mille.

134. In the Northern Territories the case incidence per mille is probably about six times as high as that of the Colony. Settlements are maintained at Accra, Kumasi, Yendi, Ho (the principal one) and Navrongo, the settlement at Navrongo being organised and run by the White Fathers.

135. Efforts are made to persuade lepers in the infective stage to enter these settlements and to submit to voluntary segregation. In the advanced stages not much persuasion is required as a rule.

136. An encouraging sign is the increasing readiness with which many lepers in the early stages of the disease present themselves as out-patients. Many, however, lose heart owing to the slowness with which results appear. Treatment consists in the eradication of concurrent maladies such as malaria, ankylostomiasis, ascariasis, chronic parasitic skin conditions, etc., combined with specific treatment. If a leper enters a settlement such as at Ho he is well fed, and drugs such as Moogrol or Alepol are administered. Protein-shock treatment has been tried with some success in a certain number of advanced cases.

137. Lepers living under ordinary conditions of life are advised to occupy separate rooms in the house or compound and to keep their clothes, bedding, cooking and eating utensils separate from those of the other inmates.

(*b*) Tuberculosis.

138. Tuberculosis retains its position as second on the list of fatal diseases at the head of which stands the group-category "pneumonia, broncho-pneumonia and bronchitis."

139. During 1932–33 the ratio of deaths from this disease to total deaths registered from all causes was 10.18 per cent. In 1931–32 the ratio stood at 12.5 per cent.

140. Of the total deaths from tuberculosis only some 5 per centum are due to forms other than pulmonary.

141. The ratio of male to female deaths is high, and shows that more than twice as many males than females die of the disease.

142. Most of the male deaths occur in the 18 to 45 years age group. The reason of this disproportion is due to the immigration into the Colony of male labour which bears most of the "heat and burden of the day" in exposure, undernourishment, excesses and overcrowding.

143. The problem remains one of the most important to be faced. The causes for the high incidence of this disease are not far to seek. Insanitary housing, overcrowding, exposure, a vitamin-deficient dietary, lack of immunity, predisposing debilitating diseases, uncleanly habits and a total ignorance of the rudimentary laws of hygiene are all important factors.

144. The opinions of medical and health officers are almost equally divided as to whether the disease is really on the increase or not. In the larger centres it would seem that the disease is just being "held," the race between pulmonary tuberculosis and improved sanitation being very close. It is possible that a degree of immunity is in process of being purchased "at a price."

145. In the less advanced rural areas a slow increase may be taking place, the source of infection often being returned ex-mine labourers.

146. The question of tuberculosis and its relationship to the mining industry was reported on in some detail during 1932–33, by a Senior Officer of the Health branch.

147. His recommendations may be summarised briefly as follows:—

(*a*) Shaft-head bathing facilities, including laid-on warm water and locker accommodation, should be provided.

(*b*) All mine labour should be medically examined and passed fit before commencing work.

(*c*) The establishment of a better balanced dietary is required.

(*d*) Improved methods of underground ventilation in some mines to dilute down residual, invisible "dust."

(*e*) Improvements in housing conditions, particularly with reference to privately-owned houses in mining-villages where mine labour often finds shelter.

148. The subject is a large one, and condensation is difficult, but the above salient factors indicate the general trend of the report.

149. As for the general problem the most hopeful lines of prevention are education in health requirements with special reference to the almost universal spitting habit. The extension of lay-out schemes to the smaller towns and villages, and the replacement of older, existing types of houses with well lighted, well-ventilated dwellings are ideals to be aimed at. An important factor in the spread of the disease is the open infectious type of case. Every effort is made to attract such cases into the various contagious diseases hospitals, but this is possible in the later stages only and when the case is destitute.

150. Accommodation for tuberculous cases exists in the Gold Coast Hospital, Accra. In out-stations, where no accommodation is provided in a contagious diseases hospital, patients are usually treated on the verandahs of the general station hospitals.

151. Where cases are discovered, and cannot be persuaded voluntarily to seek admission to hospital, the local Health Branch officer does his best by means of instruction and advice to the dwellers in the particular house or compound, and by disinfection of the premises to limit as far as possible spread of the disease.

(*c*) Pneumonia.

152. Diseases of the respiratory system other than pulmonary tuberculosis, i.e. diseases of the category " pneumonia, broncho-pneumonia and bronchitis," head the list of fatal diseases.

153. During 1932–33 the ratio of deaths resulting from this disease group totalled 15.66 per centum of the total number of deaths registered.

154. The causes of this high incidence and the methods of prevention are similar to those mentioned in the preceding section (*b*).

155. Death from pneumonia may be very sudden, and, when occurring in the early " preconsolidation " stages, may obscure the differential diagnosis between pneumonia and such diseases as plague and yellow fever. Even at autopsy the differentiation may be difficult, and it may require microscopic examination to distinguish between the " pneumonia " liver and a true yellow fever condition.

156. The more pneumonia in the Gold Coast is observed the more it is recognised that the condition is an acute, specific fever of which the pulmonary signs and symptoms are merely the local manifestations but which at times are almost entirely absent at the time of death.

157. From the standpoint of public health this type of pneumonia is most important and often extremely puzzling.

3.—*Helminthic Disease.*

(*a*) Ankylostomiasis.

158. In the Gold Coast the inhabitants, even although suffering, it may be, from a moderately heavy infestation, rarely show marked clinical symptoms of the condition. During 1932–33 the deaths registered as due to ankylostomiasis numbered 13 only.

159. It is difficult to estimate what percentage of people is infested. It probably varies widely in the various areas.

160. Although not of itself a killing disease ankylostomiasis by lowering resistance, probably plays a not unimportant part in predisposing to the attacks of other more fatal diseases. Prevention consists in the establishment of as satisfactory latrine accommodation and night-soil disposal methods as possible.

161. In the mine areas ankylostomiasis, although not figuring in the mortality list, plays its part in predisposing to pulmonary diseases in general, and tuberculosis in particular. The quartz-reef mines are more heavily infested than the banket-reef mines. In one mine on the quartz-reef one-third of the European underground staff became infested.

(*b*) Ascariasis.

162. This infestation is attracting more and more notice as representing a complete clinical entity in itself, particularly in the young. From many stations, and from all welfare clinics, the importance of this infestation in children is stressed. It appears to be almost universal.

163. The provision of satisfactory pan or pit-latrines and night-soil disposal systems, campaigns against flies, and educational propaganda in schools, dispensaries and welfare clinics are the chief methods of prevention.

(*c*) Tæniasis.

164. Tæniasis is common throughout the Gold Coast. Indiscriminate fouling of the ground with night-soil and the insufficient cooking of meat are the chief causes of spread. The condition is more prevalent, therefore, where latrine

accommodation is difficult to provide, such as in areas where no real towns exist, compounds and houses being scattered over miles of country, and where fire-wood for cooking purposes is scarce. Such conditions are not uncommon in the Northern Territories.

165. The chief methods of prevention are the provision of satisfactory latrines and night-soil disposal systems, of slaughter-houses, or slaughter-slabs, combined with proper supervision and inspection of all meat.

(*d*) Dracontiasis.

166. Dracontiasis is a very important disease from the standpoint of labour efficiency. It is common in many parts of the Gold Coast, particularly in the Northern Territories and in parts of Ashanti where drinking water must be obtained from water-holes, pools and swamps. In such places water is of poor quality and very scarce in the dry season. It is a disease rarely met with in the larger centres except as imported cases.

167. Preventive measures depend entirely on the establishment and protection of pure water-supplies. Much good work continues to be done in rural areas, particularly in Ashanti, in providing satisfactory water-supplies for townships and villages. Where chiefs and people provide labour and material, and Government skilled aid and advice, progress is readily brought about even in these days of financial difficulty.

(*e*) Schistosomiasis.

168. Schistosomiasis is less commonly treated in dispensaries and hospitals than the other helminthic diseases. It is, however, more common than is sometimes supposed, but is local in its distribution. It is usually ignored by sufferers, being often confused by them with gonorrhoea, a wide spread ailment. Between 300–400 cases are treated annually.

169. The condition is not unduly prevalent in any one station, but the Medical Officer, Oda, mentions that it is far from uncommon in his area particularly among women. This prevalence is due to the fact that the women stand in swampy pools for long periods while doing their washing.

170. Preventive methods adopted are attention to the disposal of excreta, drainage where possible of collections of water inhabited by the mollusc hosts, and treatment of the sufferers.

171. The two stations reporting the largest number of cases are Oda in the Central Province and Akuse in the Volta River District of the Eastern Province.

Animal Diseases.

172. Sporadic outbreaks of anthrax occurred throughout the country. The Principal Veterinary Officer is of the opinion that this disease is not tending to increase.

173. The initial immunisation against rinderpest of all the cattle in the Northern Territories has almost been accomplished. The use of spleen vaccine has proved most successful, and is the method now in general use.

174. Rabies was reported from several centres, and appears to be on the increase.

175. Trypanosomiasis seldom produces clinical symptoms in the local small West African shorthorn cattle which are highly resistant. The imported humped zebu has sufficient resistance to inhibit clinical symptoms during their comparatively short spell of residence, as all are imported for slaughter. Horses are highly susceptible. Successful treatment, especially in T. vivax infections, is effected by intravenous injections of tartar emetic, and of " Antimosan " a non-toxic antimony salt.

176. The Principal Veterinary Officer carried out a large clearing experiment at Pong-Tamale, which was successful in eliminating Glossina palpalis and G.Tachinoides from a large portion of the valley of the Naboggo River.

177. Detailed records are kept at all large centres with regard to the pathological and parasitic infections discovered at the local slaughter-houses by officers of the Health Branch,

178. Below are given particulars of the records kept at Sekondi, and furnished by Mr. L. G. Eddey, Sanitary Superintendent.

TABLE VII.

(*a*) BOVINES.

Infection.	Number slaughtered.	Number infected.	Percentage.
Oesophagostomum columbianum	95	36	37.8
Trematodes in liver	95	22	23.2
Cirrhosis of liver	95	19	20.0
Congestion of lungs	95	6	6.3
Necrosis of liver	95	5	5.3
Caseous lymphadenitis	95	4	4.2
Cysticercus bovis	95	3	3.2
Cystic kidney	95	2	2.1
Abscesses in liver	95	2	2.1

179. There was in addition one case each of pleurisy, cavernous angioma and abscesses of the lung.

(*b*) SHEEP.

Infection.	Number slaughtered.	Number infected.	Percentage.
Oesophagostomum columbianum	429	139	32.4
Multiple liver abscess	429	180	41.9
Parasites in liver	429	66	15.4
Nephritis	429	7	1.6
Congestion of lungs	429	4	0.9
Parasites in lungs	429	4	0.9
Caseous lymphadenitis	429	3	0.7

180. There were in addition two cases of pneumonia and cystic kidney. The dressing of the abdominal cavity revealed Cysticercus tenuicollis in almost every sheep.

(*c*) GOATS.

Infection.	Number slaughtered.	Number infected.	Percentage.
Multiple liver abscesses	739	105	14.2
Oesophagostomum columbianum	739	34	4.6
Parasites in liver	739	30	4.1
Caseous lymphadenitis	739	4	0.5
Nephritis	739	3	0.4
Pneumonia	739	3	0.4

181. There were also two cases each of congestion and abscesses of the lung.

(*d*) PIGS.

Infection.	Number slaughtered.	Number infected.	Percentage.
Caseation, etc., of head glands	831	330	39.7
Parasites in liver	831	33	4.0
Cirrhosis of liver	831	32	3.8
Parasites in lungs	831	7	0.8
Caseation popliteal glands	831	5	0.6
Abscesses in liver	831	3	0.4

182. There were also two cases each of cavernous angioma, pericarditis, parasites in the spleen and tongue.

I quote from Mr. Eddey :—

> " The condition described under caseation, etc., of head glands, mostly occurs in the sub-maxillary glands, but is not uncommon in the parotid gland and is occasionally found in the pharyngeal and upper cervical glands. Most lesions are in the caseous stage, but purulent and calcified infections have been observed. In appearance the infection is indistinguishable from tuberculous lesions."

183. Table VIII indicates the results of meat inspection at the public slaughter-house at Kumasi. These particulars of condemnations have been supplied by Mr. P. P. Horn, Senior Sanitary Superintendent. Kumasi is the great distributing cattle market for Ashanti and the Colony.

TABLE VIII.

	Cattle.		Sheep.		Goats.		Pigs.		Totals.	
	Whole	Parts.	Whole.	Parts.	Whole.	Parts.	Whole.	Parts.	Whole.	Parts.
Cysticercus bovis	90	—	—	—	—	—	—	—	90	—
Cysticercus cellulosæ ...	—	—	—	—	—	—	1	—	1	—
Onchocercosis	5	—	—	—	—	—	—	—	5	—
Contagious pleuro-pneumonia	29	—	23	—	15	—	—	—	67	—
Pleurisy	19	103	30	325	33	265	—	28	82	721
Pneumonia	23	258	22	506	11	329	—	46	56	1,139
Dropsy	12	—	50	—	39	—	—	—	101	—
Emaciation and general hæmorrhagic conditions	7	—	17	—	9	—	—	—	33	—
Pseudo-tuberculosis ...	—	—	16	—	20	—	—	—	36	—
Septicæmia	5	—	21	—	13	—	—	—	39	—
Jaundice	7	—	18	—	14	—	—	—	39	—
Trematodes in liver ...	—	608	—	1,706	—	1,620	—	—	—	3,934
Cirrhosis of liver	—	270	—	507	—	419	—	6	—	1,202
Miliary abscesses	—	10	—	115	—	209	—	—	—	334
Emphysema	—	34	—	53	—	11	—	—	—	98
Bruises and injuries ...	13	40	17	68	9	69	—	7	39	184
Nephritis	—	192	—	304	—	124	—	12	—	632
Total	210	1,515	224	3,584	163	3,046	1	99	588	8,244

5.—*Seasonal Prevalence of Diseases.*

184. Throughout the Gold Coast and its Dependencies the seasonal prevalence of diseases is not marked.

185. During the year most deaths occurred during the months of January, February and March. In 1931 the largest number of deaths was registered in the months of May, June and July. The chief seasonal factor is the duration and degree of the Harmattan—a northerly, dusty, dry, cold wind from the desert prevailing during the months of December, January and February. The influence of this wind may be very marked indeed ; in other years again it may be almost negligible.

186. In seasons of marked influence there is always a greatly increased morbidity and mortality from respiratory diseases. Diseases due to filth and overcrowding such as relapsing fever, show an upward tendency, and smallpox and cerebro-spinal meningitis may be anticipated.

187. Malaria shows no very definite relationship to season. Some of the worst cases are seen in the dry season, the factor of chill probably determining the recrudescence of infections established during the rains.

188. Yellow fever, although liable to appear at any time appears to elect the periods immediately before and after the rains, i.e. the seasons of light rains.

II.—GENERAL MEASURES OF SANITATION.

(*a*) Sewage Disposal.

189. Water-carriage systems are few and exist only at the Gold Coast Hospital, Accra, at the Prince of Wales College, Achimota, certain public-latrines in Accra, and at the European Hospital and a few bungalows at Takoradi. These continue to function fairly satisfactorily. In the larger centres the pail-latrine system is in general use.

190. In some half dozen of the largest towns motor transport is employed in removing pails to the disposal areas. Smaller towns still utilise the truck or head-carrying methods of transport. Only a few " sea latrines " survive, and these insanitary structures are rapidly disappearing.

191. Nightsoil is disposed of in a variety of ways. The commonest method is by trenching. This is carried out over a series of plots in rotation, the trenched-over areas being put out to crops. Disposal into the sea at approved places is the most usual method in towns on the seaboard.

192. In the smaller stations nightsoil is as a rule, deposited into protected, " fly-trapped " and fly-proof disposal-pits. A growing practice in the mining areas is incineration. This is carried out with success by three large mining companies. The mixing medium is either sawdust, or a mixture of sawdust and dried grass.

193. Experimental work is still progressing and valuable data is being obtained from the various types of septic-latrine at present in use. No final type has yet definitely been adopted, but it is felt that the pan-latrine is obsolescent, expensive and wasteful, and should be abandoned when possible.

194. In the smaller centres and rural areas the pit-latrine still holds its own. In the larger centres even as a result of the financial position, such structures are returning into use. In the Municipal Area of Accra between 50 and 60 are in existence.

195. The pit-latrine at its best is a " fly-nursery," even when lidded and fly-trapped. People do not invariably replace the lids, and even if the latrine is kept as dark as possible, flies do obtain ingress and egress to a greater or less extent.

196. Smoke pit-latrines, once in common use in Ashanti in the larger, rural centres are very well spoken of by many. They serve their purpose of fly-prevention well, but require a certain amount of semi-skilled attention.

197. Pit-latrines, when badly constructed, sited or neglected, can be nuisances of the first order. When well constructed, i.e. floored and roofed, and provided with lidded drop-holes, screened as far as possible, and provided with a good fly-trap in its lighter, open extension—it can be a moderately sanitary convenience. Surface fouling is prevented and any nuisance is confined to one spot. Fly-breeding is the greatest draw back, but this can be mitigated by careful exclusion of excess of light, the provision of lids to the drop-holes and well constructed fly-traps. A wise provision now adopted in many places is the grouping of sanitary structures in " sanitary units " each unit consisting of a male and female latrine, an incinerator and a refuse-bin.

(*b*) Refuse Disposal.

198. Various methods for the destruction of combustible refuse are in use. In the larger centres and the townships, it is invariably burned in a variety of types of incinerator. These types vary from the forced-draught, two-celled destructor at Accra, in which approximately 100 tons of refuse are disposed of in the 24 hours, through various gradations of brick, or reinforced concrete, closed incinerators down to the common, very useful, field-type mud-incinerator in use in the majority of the smaller centres. In the villages refuse is collected at fixed dumping-points, and burned when climatic conditions allow.

199. Indestructible refuse such as tins, bottles, etc., are broken or crushed, and are used for filling holes, quarries or lowlying areas of ground. They are well rammed-down and covered with a thick layer of earth or incinerator ash.

200. In the larger towns refuse is deposited into concrete refuse-bins built at stragetic points. Such bins are an insufferable nuisance. The people are careless, and as often as not throw their refuse on the ground near the bin and not into it. From these bins the refuse is transported by a fleet of lorries to the disposal area.

201. In Kumasi, where land is readily obtainable for sanitary purposes, no street-side refuse bins exist. A large number of well-sited incinerators has been provided. The people have been well trained, and carry their refuse to the incinerators. If there is room, the refuse is immediately thrown into the incinerator after tins and bottles have been removed. If the incinerator is full at the time, the refuse is put into a bin alongside the incinerator until it can be dealt with. In this way only the indestructible refuse requires transporting to disposal areas.

202. In most of the intermediate centres refuse is either hand-trucked, or head-loaded, from the wayside collecting bins.

203. Incinerators are to be seen in many of the larger villages in Ashanti. The labourers are trained by the Health branch and are then transferred to the chiefs for work in the villages. Such labour is paid for by the chief concerned.

(*c*) Drainage.

204. Practically no permanent drainage construction was carried out during the year nor were funds generally available for maintenance work. In the large centres the inverts of the concrete drains are very liable to corrode, partly owing to the ammoniacal nature of the liquids passing along them, and, during the rains, to the large amount of gritty detritus carried down.

205. A great deal of drainage by means of cutting earth channels was however carried out in many centres, namely in Accra, Nsawam, Kumasi, Sekondi, Axim and other places. In Tarkwa the Sanitary Committee did very good work in lining with slate the badly scoured-out earth gutters running between the blocks of houses in the town. So bad were the effects of scouring that in places the very foundations of the houses were threatened.

206. The work done in Accra has been particularly good. The Medical Officer of Health has worked upstream from the Korle Lagoon, along the Onyasia valley, and has linked-up with the work of the students of the Prince of Wales College, Achimota, who have been working down the valley towards Accra for the past year.

207. The anti-malarial drainage work carried out by Achimota has been highly creditable, and is a good example of self-help in times of financial difficulty.

208. The only permanent drainage work which need be mentioned is that in Kumasi carried out prior to the completion of the pipe-borne water supply, for the purpose of carrying-off spill water from the various water-points into the main drainage channels.

(*d*) Water Supplies.

209. The new Tamale water supply, the opening of which was reported last year, has given satisfaction. This provision should do much to influence favourably the future of this important centre.

210. The purification plant at the Veterinary Headquarters at Pong-Tamale is giving fair service.

211. The Owabi scheme for the supply of Kumasi is progressing, but the date of its completion is still uncertain. The opening of this supply is eagerly looked forward to and will mark a big forward advance in safe-guarding public health in this important and rapidly growing town.

212. The improvement of village water supplies continues steadily in Ashanti, where the chiefs and people are very willing to assist in the work, and fully appreciate the advantages of a good supply. The villages in the Colony itself are backward but there are hopeful signs pointing to an increasing interest in the provision of supplies by the people themselves.

213. Many important centres are in urgent need of the provision of an adequate, pure supply of drinking water. Of these places Koforidua undoubtedly heads the list. The question of the Koforidua supply has figured in several annual reports. The survey has been completed and a full scheme submitted and approved. This scheme is of great interest as it envisages the first gravity supply of importance in the Gold Coast installed by Government.

214. Other towns such as Nsawam, Tarkwa, Late, Somanya, Akropong, Odumasi, etc., all have claims for the provision of adequate water supplies in the future.

215. The question of the extension of the Cape Coast supply to Saltpond, which has been investigated, is necessarily in abeyance for the present.

216. The Obuasi Sanitary Board, which is a composite board on which the Government and the Ashanti Goldfield Corporation are represented, has almost brought to completion a purification scheme for the water supplied to the Obuasi, Nsuta and Zongo areas of the town under their control. A supply for the Wawasi area has also been investigated, and will be undertaken after the completion of the major work.

217. Following a tour of inspection of the various mines areas early in 1933 by a Senior Officer of the Health Branch, samples of the local water supplies were forwarded from all areas for chemical and bacteriological analysis with a view to future general improvement.

218. The table given below gives some indication of the quality of the waters supplied to Accra and to the Sekondi–Takoradi areas.

TABLE IX.

ACCRA.

Source.	Total No. of samples.	No. without B. coli in 100 c.c.	No. with B. coli in 100 c.c. but not in 10 c.c.	No. with B. coli in 10 c.c. or less.	Percentage of samples with B. coli in 100 c.c. or less.
Storage Reservoir No. 1 ...	13	13	—	—	—
,, ,, No. 2 ...	13	12	1	—	7.69
Final Filter No. 1	13	13	—	—	—
,, ,, No. 2	13	13	—	—	—
,, ,, No. 3	13	13	—	—	—
,, ,, No. 4	12	12	—	—	—
,, ,, No. 5	12	12	—	—	—
,, ,, No. 6	13	13	—	—	—
Laboratory Tap	51	51	—	—	—
Total	153	152	1	—	0.65

219. The total percentage of samples with B. coli in 100 c.c., or less, of 0.65 compares very favourably with 4.9 for 1931–32. This must be considered an excellent record.

SEKONDI–TAKORADI.

Source.	Total No. of samples.	No. without B. coli in 100 c.c.	No. with B. coli in 100 c.c. but not in 10 c.c.	No. with B. coli in 10 c.c. or less.	Percentage of samples with B. coli in 100 c.c. or less.
Final filter	1	1	—	—	—
Market tap, etc.	29	26	3	—	10.34
Water barge	6	6	—	—	—
Harbour area	5	5	—	—	—
Residential area	5	5	—	—	—
Public standpipes	27	23	2	2	14.8
Total	73	66	5	2	9.59

220. The total percentage of samples with B. coli in 100 c.c., or less, is practically the same as in 1931–32, namely 9.59 as compared with 9.7.

(*e*) CLEARING OF BUSH AND UNDERGROWTH.

221. The clearing of bush, undergrowth and rank grass in towns is carried out as frequently as funds permit. In the forest belt in the rains it is necessary to clear areas at least once a month to keep them in proper condition. In the dry season the period between cuttings can be prolonged, and " elephant-grass " and " spear-grass " can be hoed-out and the roots burned.

222. In the newer residential areas dhub grass is steadily planted round bungalows. When it takes root it has the property of keeping down the growth of all ranker grass.

223. Steady work in the clearing of obstructive trees has progressed in the Residential Areas in Tarkwa, Obuasi, Kumasi, Koforidua, Keta and Tamale. Rot-holes in trees in residential areas, by permitting collections of water, continue to be a danger which has continually to be guarded against.

224. The clearing of vegetation is a most important safeguard in that it removes cover for mosquitoes, etc., during the day, and gives no facility for the careless disposal of the odd tin or bottle and household refuse. It is becoming increasingly difficult to keep the surroundings of the larger centres properly cleared, and farming is allowed where possible in order to obviate the necessity for this expensive recurrent work. Crops are, however, controlled. The best crops for the purpose are cassada and ground-nuts. Bananas, plantains, pine-apple, sisal, etc., owing to their water retaining properties are rigorously excluded.

225. The maintenance of a well cleared zone round rural townships and villages is one of greatest difficulty. If an area of 50 yards is cleared, the tendency is to plant crops right-up to the compound walls. Owing to the fouling of this area for a series of years it probably produces the richest crops. The overgrown perimeter of the small town or village is one of the greatest menaces that has to be dealt with. Cover is afforded for tins and bottles. Water retention inevitably results in the rains, and ideal facilities are offered for the propagation of Aedes ægypti. This factor discounts to some extent the value of a larval index in such areas. Houses and compounds are often free of larvæ, but right-up against the compound fence there may be long grass or tall crops covering deposits of tins and bottles, the majority of which contain water, and many of them larvæ.

(*f*) Domiciliary Visiting and Inspections.

226. House-to-house inspection forms one of the most important duties of all Health Officers. The standard aimed at is the inspection of all premises in the larger centres at least once a week. Staff shortage, however, does not permit this standard in several important places at the present day.

227. As close a watch as possible is kept on the townships and villages in known yellow fever areas in the Nsawam, Koforidua and Akuse districts. There are, however, wide rural areas which cannot be dealt with, and when these are situated on important trade routes, they cause anxiety.

228. Details of the results of such inspections in certain of the larger centres are given below.

TABLE X.

Town.	Conviction for mosquito larvæ.	Fines for larvæ.	Conviction for insanitary conditions.	Fines for insanitary conditions.
		£ s. d.		£ s. d.
Accra	283	202 5 0	3,059	679 9 6
Koforidua	376	144 14 6	1,674	343 14 0
Cape Coast	148	78 18 0	247	58 8 6
Sekondi	129	41 13 0	548	88 0 6
Kumasi	305	100 9 0	2,272	478 19 6
Tamale	220	9 13 6	207	17 11 9
Total	1,461	577 13 0	8,007	1,666 3 9

229. For the Gold Coast, as a whole, the total number of convictions for mosquito larvæ was 6,612, and the total of resulting fines amounted to £1,954 15s.

230. For insanitary conditions, the number of convictions totalled 26,363, with £5,401 18s. 6d. for fines collected.

231. Domiciliary visiting was carried out by the Women Medical Officers in charge of Welfare Clinics, and by the Health Visitors attached to these centres.

232. Red Cross sisters in charge of the Sekondi and Cape Coast Clinics also participated actively in the work.

233. Much valuable visiting was also carried out in the period under review by voluntary lady workers, both European and African, of the Gold Coast League for Maternal and Child Welfare Section of the Gold Coast Branch of the British Red Cross Society.

(*g*) Offensive Trades.

234. The control of offensive trades does not figure largely among the activities of the Health Branch. There are only two such trades which have to be dealt with.

235. The more important is that of fish-curing, which is common in most sea-board towns. In some of the larger inland centres fish, incompletely cured on the coast, is often subjected, when putrifaction commences, to a second curing process. This trade can be particularly noisome.

236. A minor offensive trade is that of hide curing, a little of which is carried out in Kumasi. The control of this trade presents little difficulty.

III.—SCHOOL HYGIENE.

237. The routine inspection of school premises and scholars constitutes an important function of the Health branch. Unfortunately owing to staff shortage this work has rather fallen back, the Health branch being unable to carry out the routine inspection of school children as thoroughly as is desirable.

238. On the whole, school premises in the larger centres are fairly satisfactory. In some instances overcrowding is reported, and dissatisfaction expressed with regard to the sanitary arrangements obtaining, and the general cleanliness of the school precincts. The amendment of the law including "schools" in the definition of "premises" has helped considerably in dealing with the privately-owned unassisted school. These institutions are, however, still a great source of trouble owing to the rapidity with which they are moved from one premises and district to another. One such school was encountered in Accra which possessed no premises whatever, but was completely and entirely "open air." Advance in school hygiene, in such times as at present, is difficult, but the standard of last year has, at least, been maintained.

239. In Table XI the results of examination for splenic enlargements are given :—

TABLE XI.

Locality.	No. of children examined.	No. found with enlarged spleens.	Percentage with enlarged spleens.
Accra	1,294	205	15.8
Koforidua	860	233	27.1
Cape Coast	404	83	20.5
Sekondi	374	84	22.5
Takoradi	126	31	24.7

240. Splenic indexes from malaria are not of much value unless the children are divided into small age-groups. In the age-groups 5–6 the index is generally high. The index falls as the children advance in years, and after 14 it is usually less than half that of the first school-age group. The following figures for Takoradi can be quoted in support of this statement, which is generally applicable :—

	per cent.
5–6 years	39.9
6–8 years	21.4
8–11 years	23.7
11–13 years	14.0

The falling spleen-rate obviously indicates the acquirement of a tolerance to the disease.

IV.—LABOUR CONDITIONS.

241. During 1930–31, 3,088 immigrant labourers and deck-passengers landed at Takoradi. In 1931–32 these numbers fell to 1,433. During the year there was a still further drop to 1,092. The influx of labour over the land frontiers cannot be estimated, but it has probably fallen in the same proportion as sea-borne immigrants.

242. Unemployment is rife, and many of the immigrant labourers have returned home. Those remaining are largely dependent for housing and maintenance on " brothers " still in employment.

243. Wages have fallen considerably and a certain amount of suffering is evident, for those in work are really solicitous for their out-of-work fellow countrymen, but on the low scale of pay prevalent to provide both for these and for themselves is exceedingly difficult.

244. The price of staple home-grown food-stuffs has indeed fallen, but not sufficiently to counter-balance the low rate of wages, and the extra burden of supporting unemployed fellow countrymen which falls on those still employed.

245. House and room rents have fallen but are still high. Trade stagnation has, however, given a certain amount of bargaining power to tenants in fixing rents. Formerly where only two labourers hired a room and shared the rent, they now find it necessary to bring in others to help to shoulder the burden and in this way gross over-crowding becomes common.

246. During the year the number of deaths registered as the result of starvation was 31. In 1931–32 the number of such deaths was 15.

247. In Kumasi for some years past the Public Health Board has conducted a " Refuge " in the Zongo for the destitute. Here an undernourished " out-of-work " can obtain shelter and food until once more fit to fend for himself. The destitute do not appear to take unfair advantage of this provision, for as soon as they are able they drift home or continue their search for employment. This humane attempt at poor relief in Kumasi is worthy of wider adoption.

V.—HOUSING AND TOWN PLANNING.

248. One might conjecture that the prevailing depression would be reflected in a diminution in the number of houses commenced and completed in the larger centres, but this is not very marked.

249. In Koforidua 44 houses were finished as against 30 in 1931–32. In Sekondi 17 were completed as against 13 in the previous twelve monthly period. Cape Coast reports 17 erected as compared with 18 for the previous year. In Accra 21 houses were constructed as compared with 17 in 1931–32. Turning to Kumasi, which headed the list in recent years building permits to a total estimated value of some £20,000 were issued during 1932–33 as compared with some £40,000 in 1931–32.

In spite of trade depression the construction of a much improved type of house continues in the larger centres.

250. People prefer more and more to build in cement-block, and are content to wait till they can achieve this object rather than to construct a less permanent house in *pise-de-terre*.

251. In the outskirts of Accra it is not unusual to see well constructed houses, which have been built far in advance of the development of the lay-out, with no definite means of road approach or other facilities.

252. In the smaller townships and villages little progress can be reported. Only a few new lay-outs have been commenced.

253. The activities of the Health Branch have been concentrated on encouraging the completion of work already commenced rather than on the inauguration of new lay-outs.

254. In Ashanti, which is ahead of the Colony in such matters, the present policy consists in consolidating the work already accomplished on the numerous lay-outs started during the last few years. Several lay-outs, on which good work

had been done previously, have had to be abandoned and have largely reverted to bush. It is believed, however, that once the price of cacao improves, many houses in village lay-outs which are as yet unfinished will be rapidly brought to completion.

255. Care, however, has to be exercised in preventing the people from incurring heavy debts for building material and corrugated iron.

256. The set-back that house construction has received on well laid-out schemes in the smaller townships and villages is much to be regretted, for the people really wish for better conditions, and are not likely to go back to the " wattle and daub " hovels of the past without a struggle. They undoubtedly prefer the well-built, *pise-de-terre* compounds with rooms of good dimensions erected on an adequate ground area.

VI.—FOOD IN RELATION TO HEALTH AND DISEASE.

(1)—Markets.

257. Little new market construction took place during the year, the chief feature being the re-organisation of the Yensua Market, Sekondi. This market has been paved throughout, and extra sheds added. A " fly-proof " shed for bread-sellers was constructed, the first in the Gold Coast provided for such vendors. A small market of 96 stalls was instituted for the Essikadu area of Sekondi.

258. The rent of market stalls has been reduced in most of the smaller centres as a result of trade depression, the object being to fill vacant stalls and to reduce the number of street hawkers.

259. The revenue producing possibilities of markets is often lost sight of. A well sited and organised market rapidly becomes popular. There is no need to erect an elaborate or costly type of shed. An example of such is the general market in Kumasi, where there is no diminution in the volume of trade, and very few empty stalls.

(2)—Slaughter Houses.

260. Most of the larger centres have satisfactory slaughter houses and hanging accommodation, with sanitary facilities for the disposal of offal and excrement.

261. The smaller centres are usually provided with slaughter houses of simpler type, or slaughtering-slabs.

262. All animals are inspected by an officer of the Animal Health Department or Medical Department before slaughter and the carcases are subjected to close scrutiny afterwards. The various parts, when passed as sound, are " stamped " before being liberated for transference to the meat-market.

263. In nine large centres, flyproofed market sheds exist for the sale of meat. In some of the smaller markets, flyproofed stalls have been constructed, while in others meat exposed for sale is kept under wire-gauge cages.

(3)—Cattle Sheds.

264. Only at the headquarters of the Animal Health Department at Pong-Tamale do true cattle sheds exist.

(4)—Dairies.

265. No dairy at present exists in the Gold Coast.

(5)—Aerated Water Factories.

266. Regulations exist for the control of the manufacture of aerated water in the large centres. Factory premises are regularly inspected, and samples of their products are subjected to bacteriological examination at regular intervals. When the products fail to reach a satisfactory standard of purity, the factory is closed until such time as the water fulfils requirements.

(6)—Restaurants and Eating Shops.

267. In the larger centres restaurants are subjected to regular inspection to ensure a satisfactory hygienic standard, e.g. with reference to general cleanliness, protection from flies and dust of foodstuffs and drinks, proper cooking facilities and adequate arrangements for the washing of eating utensils.

268. In some centres restaurants are subject to a special licence. When a licence is required for any premises, an opportunity is taken to compel the premises to be brought up-to-date before a licence is granted.

(7)—Bakeries.

269. In the larger centres bakeries are licensed, and this precaution has done much to improve the conditions under which bread is made and stored.

(8)—Food Inspection.

270. The routine inspection of foodstuffs is carried out in all markets, and visits are paid to all stores and shops for the examination of tinned-meat, fish, milk, pork barrelled in brine, flour, etc.

271. Little difficulty is experienced as a rule in carrying out this important work, for the firms find that they cannot sell deteriorated produces to hawkers and petty-traders, who bring such if unsound straight to the sanitary authorities for condemnation. Firms, therefore, are quite ready to surrender unsound food and usually report its occurrence asking for a condemnation certificate and removal of the unsound article.

(*a*) Deficiency Diseases.

272. Deficiency diseases do not figure largely either in the morbidity or mortality returns. The dietary of the people does not apparently lack in calorific value, but cannot be considered to be very well-balanced, as it is somewhat deficient in protein and animal fat, and fresh fruit does not enter into it sufficiently.

273. When the position occupied by diseases of the respiratory system in the mortality list is considered, it would appear that the local dietary is deficient in vitamin A constituent. Such deficiency becomes more manifest when an individual leaves his natural surroundings and changes his occupation. When a heavy physical demand is made on him his lowered resistance then becomes evident. the ultimate results in such cases are typically seen in the labour employed in the deep-mining industry.

274. Food deficiency undoubtedly plays an important, predisposing part in the incidence of non-specific ulcers which are so common and disabling, particularly in the north.

275. Dental caries is not unduly common, but the condition of the gums is often most unsatisfactory, sometimes even at an early age.

276. Beri-beri, scurvy and rickets are not common.

277. Diet deficiency probably plays an important part in certain diseases of infants and young children. Dr. C. D. Williams, Woman Medical Officer, published in last year's Annual Report an account of a series of cases in which the most marked features were skin lesions and a very high mortality rate. The clinical picture is typical up to five years of age, and to a modified degree up to ages of 12–14 years. In all cases a history of faulty diet can be elicited.

(*b*) Measures taken to spread Knowledge of Hygiene and Health.

278. In future more stress will have to be laid on the propaganda of health knowledge, and this important activity will require careful organisation, possibly more than can be undertaken by the Health Branch alone. The people of the Gold Coast will have to be educated to demand better conditions of environmental sanitation, and furthermore to be prepared to carry out the work themselves, and not to depend as in the past wholly on Government.

279. The teaching of Hygiene forms part of the curriculum of all Government and Mission Schools, and of such institutions as the Prince of Wales College, Achimota, Wesley College and the Akropong Seminary.

280. Every endeavour is made to keep such training on as practical a basis as possible, and in rural schools the scholars are expected to construct their own latrines and incinerators, and to supervise the provision of clean drinking-water for the needs of the school.

281. Both at Achimota and Akropong social service work is undertaken in the surrounding villages. Every encouragement is given by the Director of Education and his officers to the propagation of health knowledge throughout the schools. A most valuable medium for such spread of knowledge exists in the excellent *Teachers' Journal* published quarterly, which has a very wide circulation.

282. Monthly health-days, or annual health-weeks, are held in most of the larger centres. Health Officers lose no opportunity of giving informal talks to pupils in schools, to tribunal registrars and to chiefs and people. Medical Officers in dispensaries and Women Medical Officers in charge of Infant Clinics are continually giving advice to mothers attending such institutions with their children.

283. All officers, whether Medical Officers or Medical Officers of Health, Women Medical Officers, Sanitary Superintendents, Health Visitors, Sanitary Inspectors, Midwives, Village Overseers, etc., while carrying out domiciliary visiting, are continually trying to bring home to the people the need for a higher standard of environmental hygiene.

284. The Gold Coast League for Maternal and Child Welfare section of the Gold Coast Branch of the British Red Cross Society continues to carry out in each large centre most useful work among the mothers and children, both in their house-to-house visiting and at the various weighing-clinics. These ladies meet once a month, and are given a lecture on some subject of interest and importance bearing on their activities.

285. During the past year a Gold Coast Branch of the British Red Cross Society has been instituted. Divisions have been organised in the larger centres and at Cape Coast and Sekondi the Infant Clinics have been taken over by them on a preventive basis. European Red Cross Sisters have been placed in charge and much good work has been accomplished both at the Clinics and in the homes of the people. It is believed that the Gold Coast Branch of the British Red Cross Society will in future play a most important part in the propagation of knowledge, and in the extension of the maternal and infant welfare movement. A big field lies open for their activities.

(*c*) Training of Health Personnel.

286. The Training School for Sanitary Inspectors in Accra has almost ceased to function. Most of the Sanitary Inspectors-in-Training have passed-out as 2nd Division Sanitary Inspectors and no candidates for training have been taken on. The Training Officer has, owing to shortage of staff, had to omit much of the theoretical class-room training formerly given, and to endeavour to give such training, when he himself and the junior staff have been engaged in practical work in the districts of the town.

(*d*) Recommendation for Future Work.

287. In present financial conditions and as the people are not yet fully educated or organised up to the point of helping themselves, it is felt that recommendations are out of place.

288. The standard of sanitation although fairly maintained in larger centres is, generally, falling, and must fall still further, until local sanitary authorities of townships and rural areas beyond the towns under the Town Councils Ordinance are empowered to collect revenue and impose rates, when progress again will once more become possible.

W. M. HOWELLS,

Senior Health Officer.

for Deputy Director of Health Service.

IV.—PORT HEALTH ADMINISTRATION.

289. During the year no Gold Coast port was declared infected.

290. Port health work is carried out at Takoradi, Accra, Keta, Ada, Winneba, Saltpond, Cape Coast, Axim and Half Assini.

291. During 1932–33, 406 vessels entered the harbour at Takoradi, and were boarded on arrival by an officer of the Health Branch. No vessel was found to be "infected" or "suspected." During 1930–31 and 1931–32, the number of vessels entering the port was 703 and 523 respectively.

292. Some 1,092 deck passengers were landed at Takoradi and were examined, disinfected and, if necessary, vaccinated. In 1931–32 the number of deck passengers landing totalled 1,433. Deck passengers who had come from infected ports were kept under surveillance, or were detained in the Contagious Diseases Hospital, Sekondi, for the appropriate period. One case of chicken-pox was landed during the year.

293. Cattle to the number of 127 head were landed during the year, and were dealt with by the Health Branch. A "pound" for landed cattle is much needed at Takoradi.

294. At Takoradi 23 rat-guards were hired to vessels not possessing any.

295. No plague infected rat was found at any of the Gold Coast ports during the year.

296. The Port Health Officer's launch continued to give satisfaction. The average monthly running cost was £13 3s.

297. The water-barge was frequently inspected, and samples taken for bacteriological examination; the results of which were uniformly satisfactory. During the year 633,967 gallons of water were supplied to ships in the harbour.

298. 3,260 deck passengers of whom 176 were Kru labourers were landed at Accra and appropriately dealt with.

V.—MATERNITY AND CHILD WELFARE.

299. The figures returned by the Infant Welfare Clinics showed a decrease. It must be remembered, however, that the figures given in the table below do not represent the sum total of this valuable work. Medical officers at various outstations have established small clinics in conjunction with their dispensaries and a large amount of antenatal, postnatal and general educational work is being done. For example at Ho over 500 children were seen, at Nsawam the Medical officer set apart special days for this work and the scheme became very popular amongst mothers. At Bekwai a weighing clinic was established by the Medical officer and it soon attracted attention, and so on. Even as far north as Tamale a weighing clinic and welfare centre was established during the year under review. The valuable work done in these outlying areas does not appear in the figures below.

300. As was mentioned in last year's report, the Gold Coast Branch of the British Red Cross Society undertook the management of the Infant Welfare Clinics at Cape Coast and Sekondi, and these clinics continue to do good work.

It is hoped that the local Red Cross Branch will be able to extend this excellent work.

ATTENDANCES AT CLINICS 1932–33.

	Attendances.			
	Children.		Expectant mothers.	
	1931–32.	1932–33.	1931–32.	1932–33.
Accra	28,441	25,655	1,826	1,237
Cape Coast	12,271	4,632	2,799	1,976
Sekondi	8,816	4,718	3,873	2,758
Shama	1,017	761	—	—
Koforidua	25,616	17,008	2,860	3,589
Kumasi	30,700	21,543	8,104	9,266
Total	106,861	74,317	19,462	18,826

301. The table given below gives the number of admissions to the Princess Marie Louise Hospital, Accra, and the Kumasi Welfare Centres. These institutions are not solely Welfare Centres; they are hospitals as well, but, nevertheless, do valuable work on preventive and educational lines.

	1930–31.	1931–32.	1932–33.
Accra Princess Marie Louise Hospital	516	589	551
Kumasi Welfare Centre	566	668	637

302. The work of the Maternity Hospital, Accra, is reviewed in the next section.

303. There is a crying need for a Maternity Hospital at Kumasi to deal with abnormal obstetric cases and to be a training institution for midwives for the Akan peoples.

VI.—HOSPITALS, DISPENSARIES AND VENEREAL CLINIC.

Tables and returns, etc.

304. At Appendix I, will be found a table showing all the Hospitals and Dispensaries in the Colony and Mandated Territory of Togoland, including the infant welfare centres and contagious diseases hospitals administered by the Health branch.

305. Table V gives a combined summary of all cases (in- and out-patients) treated by both Medical and Health branches in the hospitals, dispensaries, and prisons of the Colony and Protectorate. This table includes cases treated in the permanent contagious diseases hospitals and therefore gives all the cases treated during the year in Government institutions. The venereal clinic figures are included in the out-patients table.

306. On Table V are based the diagrams showing the incidence of infective and other diseases.

307. Table VI is an analysis giving separately the figures for the Medical Branch and the Health Branch.

308. The Health branch figures are further dissected to show the cases treated at the infant clinics and the contagious diseases hospitals.

309. The following five-year table shows the numbers of in-patients treated at the hospitals of the three principal centres of the Colony.

Station.	1928–29.		1929–30.		1930–31.		1931–32.		1932–33.	
	European.	Africans.	European.	Africans.	European.	Africans.	Europeans.	Africans.	European.	Africans.
Accra	312	2,606	300	3,087	310	3,572	273	3,645	236	3,349
Sekondi ...	224	868	216	1,050	161	1,157	250	1,075	149	1,115
Kumasi ...	203	2,508	213	2,137	173	2,360	166	1,954	146	2,334
Total ...	739	5,982	729	6,274	644	7,089	689	6,674	531	6,798

Average cost per Patient per diem.

310. The average daily cost per patient per diem for the principal hospitals of the Colony during the past four years is shown below.

(These costs have been based on the expenditure for diets and provisions, fuel and light, medical comforts and kitchen staff only).

	1929–30.	1930–31.	1931–32.	1932–33.
	s. d.	*s. d.*	*s. d.*	*s. d.*
European Hospitals. (Accra, Kumasi, Tamale, Sekondi, Cape Coast, Axim, Winneba) average cost	5 5	5 0¼	4 4	5 1¾
African Hospitals. (Gold Coast Hospital, Accra, Kumasi, Tamale, Sekondi, Cape Coast, Axim, Saltpond, Koforidua, Winneba) average cost	1 2	1 1½	0 7½	0 7½

European Hospitals.

311. No extensions or enlargements have been made during the year.

African Hospitals.

312. One or two extensions and additions were made to African hospitals and dispensaries in the Northern Territories. There was no new work undertaken in the Colony proper. Details of various improvements will be seen in the appropriate sections below :—

Accra.

313. The Gold Coast Hospital, Accra with its 227 beds and cots continued its useful work. The figures for this year show a slight decrease on previous figures.

	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.
Total out-patients	13,786	14,638	14,191	13,261	13,137
Total in-patients	2,661	3,087	3,572	3,645	3,349
Major operations	602	671	650	675	560
Minor operations	295	436	670	709	466
Daily average in-patients ...	208	233	222	223	218

314. During the year the Isolation Block was converted into a children's ward. It contains 14 cots and children up to five years of age are admitted, older children going into the ordinary wards. The change has greatly relieved the congestion in the female wards and in consequence three additional female beds have been added. It has proved a great success and the children are very happy together.

315. The X-Ray department has continued its useful work. There was trouble at times with the apparatus during the year. It is now 10 years old and the question of installing a new machine is under consideration.

316. The Venereal clinic shows an increase in the numbers treated as compared with last year. The report of the Medical Officer in charge is summarised in the table below :—

	1930–31.	1931–32.	1932–33
Patients treated (old and new cases) ...	866	586	863
Gonorrhœa, male and female	766	539	685
Chancroid	28	24	85
Syphilis, male and female	72	22	93
Framboesia	—	—	—
Non-venereal	—	—	—
Injections N.A.B.	789	459	387
Injections B.S.T.	776	396	151
Injections collosel iodine (vein)	966	313	—
Injections intramine (muscle)	812	—	118

317. A yaws clinic is held twice a week and a gynæcological clinic once a week.

Nurse-Dispensers' Scheme.

318. On account of retrenchments and economies it has not been possible to carry on the scheme for training nurse-dispensers as first planned. Nevertheless, although curtailed, it is proceeding on the lines laid down.

319. At Appendix 7 will be found a note on the scheme and the present position with regard to the problem of training African assistants for work in rural areas of the Gold Coast.

Government Medical Scholarships.

320. In October 1930 the regulations and conditions governing the award of one or more scholarships annually to suitable African candidates for the purpose of studying medicine in the United Kingdom and obtaining a registrable qualification were gazetted. Owing to the financial situation no grant was made for 1933.

Maternity Hospital, Accra.

321. The Maternity Hospital, Accra, one of the most valuable institutions in the Colony, continued to do first rate work during the year. The figures are higher than ever they have been, and the need for extension is greater than ever. Two midwives qualified during the year.

322. It is hoped that an Isolation Block for the accommodation of septic cases will be completed during 1933–34. Plans have been passed and building operations will begin early.

323. At Appendix 4 will be found the annual report of the maternity hospital.

Kumasi.

324. The African Hospital, Kumasi, continued to do good work although the out-patient figures show a drop. Various factors have probably contributed to this. The Basel Mission Hospital at Agogo now attracts very many patients. This hospital also serves the Juaso area which was formerly visited regularly from Kumasi and the figures for which were included in Kumasi. The general financial depression has also had its effect in limiting travelling, and thus reducing the number of out-patients who formerly came from a distance.

325. The following table gives the figures for the past four years :—

	1929–30	1930–31.	1931–32.	1932–33.
Out-patients—total	19,539	20,881	17,804	13,927
In-patients—total	2,137	2,360	1,954	2,334
Surgical operations, major	194	206	229	180
Surgical operations, minor	170	282	382	381
Average daily number in hospital	157.5	138.9	134.2	140

Bawku.

326. A new dispensary was completed at Bawku and opened in the month of May, and a Rest House was converted into a ward for the use of patients coming from considerable distances. A new ward, which will accommodate six patients, is at the present moment under construction and will be completed shortly.

Bole.

327. A new dispensary is nearing completion at Bole, where a nurse-dispenser will be stationed when one is available.

Navrongo.

328. The new hospital at Navrongo which was described in last year's report started work during the year.

329. The first month or two was mainly occupied in transferring and installing hospital equipment from the old hospital at Zuarungu.

330. Since the middle of May over 150 persons have been treated as in-patients, and the medical officer remarks in his annual report that it is not now very difficult to persuade patients to come into the hospital. It is very encouraging to note this evidence of growing confidence in European medicine amongst a primitive people.

Prang.

331. The chief of the Zongo at Prang constructed a good swish dispensary during the year for the use of the medical officer on his periodic visits.

Tamale.

332. Three round houses outside the hospital compound at Tamale were re-built during the year. These huts are used for cases of pulmonary tuberculosis, chickenpox and similar infectious diseases.

Zuarungu.

333. The buildings at Zuarungu ceased to be used as a hospital after the opening of the new hospital at Navrongo but they have been retained as a dispensary.

Keta.

334. During the year the greater part of the original hospital at Keta and its adjacent buildings, such as the Nurses' quarters, kitchens, bath houses, etc., were demolished as a result of coast-erosion by the sea. The dispensary and store remain untouched.

335. The hospital beds and equipment were transferred to the contagious diseases hospital some distance away which will serve as a hospital until a suitable private building is acquired as a temporary hospital, or a new one is built.

Yendi.

336. A new female ward capable of accommodating 10 beds is at present in course of construction, and should be completed in the course of a few weeks.

Travelling Dispensaries.

337. A travelling dispensary operated for a portion of the year in the Kpandu area in British Togoland, Mandated Territory. The number of patients seen and treated amounted to 2,026 and the work done was very much appreciated by the chiefs and people.

Mission Hospitals and Dispensaries.

338. *Agogo.*—This hospital which is under the control of the Basel Mission continued to do work of a high standard during the year.

339. *Kpandu.*—The Roman Catholic Sisters continued their valuable work amongst children.

340. *Eikwe.*—The Roman Catholic Sisters at Eikwe in the Axim district conducted a Child Welfare Centre which was appreciated by the people of the area.

341. *Agona.*—A certain amount of simple medical work was carried out by the Seventh Day Adventists in Agona.

342. *Yendi.*—The Assemblies of God Mission in the Yendi district undertook the treatment of minor ailments in their area.

343. *Jirapa.*—The Fathers at Jirapa, near Lawra, do a certain amount of simple medical treatment for the people in this area.

344. *Navrongo.*—The White Fathers at Navrongo conducted a small clinic where minor ailments are attended to. They also run a small Leper Dispensary.

345. *Mampong.*—The English Church Mission at Mampong conducted a dispensary with a lady doctor in charge.

346. In many instances Government assists by supplying simple drugs and dressings.

REPORT ON THE WORK OF THE DENTAL CLINIC.

347. *Staff.*—There is one Dental Surgeon for the whole Colony. He was on duty throughout the period under review.

348. In addition to work carried out at the Dental Clinic, Accra, he visited the following outstations :—Kumasi twice, Sekondi twice, Cape Coast twice.

Classification of patients treated.

	1929–30.	1930–31.	1931–32.	1932–33.
Officials—European	724	941	523	407
Officials—African	1,548	2,240	2,387	3,086
Total officials	2,272	3,181	2,910	3,493
Non-Officials—European	620	745	455	517
Non-Officials—African	1,259	1,361	398	426
	1,879	2,106	853	943
Total treated	4,151	5,287	3,763	4,436

349. Dental operations including extractions, fillings, dressings, mechanical repairs, etc., amounted to 6,323. The chief pathological conditions met with during the year were dental caries, abscesses, pulpitis, periodontitis, pyorrhœa, gingivitis, spetic roots, stomatitis. Dental caries amounted to 2,538 cases which is equivalent to 52 per cent of the cases treated.

VII.—PRISONS AND ASYLUMS.

(*a*) Prisons.

350. The Prisons of the Gold Coast administered by the Prison Department consist of four convict prisons and 20 local prisons.

351. The Convict prisons are situated in Accra, Sekondi, Kumasi, Tamale; in these prisons all long-sentence prisoners are confined.

352. Improvements to prison buildings were as follows:—

Yendi.—A new Prison has been built to replace an insanitary building which had been condemned.

Navrongo.—An extra cell was built during the year.

Ho.—Extra ventilation to cells was provided.

Obuasi.—Extra ventilation to cells was provided.

Bawku.—Extra ventilation to cells was provided.

353. The health of prisoners has been good and no deficiency diseases were reported.

354. A mild outbreak of chickenpox occurred in the Prison at Sekondi during the year.

355. The average number on the sick list was 41.24 out of a total average daily population of 1,927.56 or 2.14 per cent.

356. There were 33 deaths which is equivalent to 17.12 per 1,000.

	Total deaths	Percentage of average daily lock-up.
1926–27	30	1.85
1927–28	53	3.11
1928–29	39	2.16
1929–30	34	1.93
1930–31	24	1.31
1931–32	26	1.51
1932–33	33	1.71

(*b*) Asylum.

Central Asylum, Accra.

357. On the 31st March, 1933, the staff of the Central Lunatic Asylum was composed as follows:—

1 Alienist Officer.
1 Head Attendant.
1 Assistant Attendant.
1 Matron.
21 Mental Nurses.
1 Gatekeeper.

358. On the 31st March, 1933, the total number of inmates was 375 as compared with 355 last year.

359. The table below shows admissions, deaths and discharges and allows for comparison with other years.

	1929–30.	1930–31.	1931–32.	1932–33.
Remaining 1st April	246	275	326	355
Admitted during the year	104	131	127	132
Discharged during the year	28	32	35	22
Escaped during the year	2	1	4	4
Deaths	44	47	58	86
Remaining on 31st March	275	326	355	375

360. The general health of the Asylum inmates cannot be considered as satisfactory. The building is unsuitable as a Mental hospital. Overcrowding exists and at the end of the year there were 375 patients which is more than the building was designed to accommodate, although an extension to take 60 extra patients was added in 1931.

361. Infirmary accommodation is inadequate.

362. The diet given to the patients is excellent and much appreciated and there were no deficiency diseases during the year.

363. All sanitary work at the institution is done by the inmates under supervision.

364. The building of a new asylum cannot be considered in the present state of the Colony's finances.

365. The mental diseases from which the inmates suffered can be seen in Table V.

VIII.—METEOROLOGY.

366. Tables giving meteorological observations at Accra and at four other stations appear in the Return on page 59.

IX.—SCIENTIFIC.

(*a*) Annual Report of the Laboratory Service.

CONTENTS.

Annual Report of Laboratory Service, 1932–33.

I.—General Remarks.

367. This report covers the period 1st April, 1932, to 31st March, 1933.

368. *Staff.*—The European staff has consisted of one senior pathologist, two pathologists, a laboratory superintendent and two laboratory assistants. The Retrenchment programme was completed when Mr. Leeson, Laboratory Superintendent, proceeded on leave in June prior to retrenchment on abolition of that office.

369. The native staff remained the same as detailed in last year's report and consisted of eight laboratory attendants, three of whom served in outstations, one 2nd division clerk and ten labourers.

370. It is to be regretted that no funds were available for the training of new laboratory attendants.

371. *The Laboratory.*—Almost all the work carried out in the laboratory during this period has been of a routine nature, and with the present reduced staff it has been found impossible to do any research work.

372. *Publications.*—The following papers have been published during the year:—

Russell, Dr. H. M. ... Experimental relapsing fever. (*West African Medical Journal*, VI No. 3.)

Russell, Dr. H. M. ... Pathology of the spleen in relapsing fever. (*Trans. Roy. Soc. Trop. Med. and Hyg.* XXVI No. 3.)

Russell, Dr. H. M. and Taylor, Dr. C. J. S. O. Sickle cell anæmia. (*West African Medical Journal*, V. No. 4.)

Woodward, Mr. S. F. Persistence of Active Spermatozoa in the African Night-Adder. *Causus rhombeatus* (Proc. Zool. Soc. Part I, 1933.)

II.—Report of the Routine Divisions.

373. *Yaws and Syphilis.*—The results of Wassermann tests at Accra were similar to those for the year 1930–31, 2,731 tests yielding 43 per cent positives.

374. *Typhoid group. Bact. typhosum* was isolated on 11 occasions; six times from the blood, three times from fæces, and twice from the urine.

375. *Bact. Para-typhosum A.* was isolated three times from the blood, and *Bact. Para-typhosum C.* once.

376. This increase in positive blood cultures as compared with last year's report is probably due to improved technique and to an increase in the number of examinations made.

377. It was noted that in two cases of typhoid both blood culture and widal were consistently negative until very late in the disease, the blood culture yielding a positive result when the agglutinine titre of the patient's serum was high (1 : 4000–1 : 5000).

378. *Other Bacteriæmias.*—In a series of 98 blood cultures B. coli was isolated on six occasions, four of these being from cases during puerperium. An anærobic streptococus was isolated once, and a hæmolytic streptococus once both from cases of puerperal septicæmia.

379. *Diphtheria.*—Two proved virulent strains of C. diphtheriæ were isolated during the year. Both were isolated from children who complained of slight sore throat and had no constitutional symptoms and none of the contacts contracted the disease and throat swabs from them remained negative.

380.

Dysentery.	*No. of stools examined.*	*E.histo-lytica.*	*Balanti-dium coli.*	*Lamblia intestinalis.*
Protozoal ...	4,493	34	8	6

Bacillary.—From a total of 194 fæces examined by cultural methods B. dysenteriæ (Flexner) was isolated 30 times and B.dysenteriæ (Shiga) four times.

381. *Histological examinations.*—Material from 275 cases was sectioned. This included 27 malignant tumours (17 carcinomata and 10 sarcomata).

382. *Zoological.*—Mr. Woodward has devoted his spare time to zoological studies and a list of reptiles prepared by him is given in an appendix.

G. ROBINSON,
Pathologist.

APPENDIX A.

Plague Experiments.

By A. S. Burgess, M.D.

383. The plague vaccine mentioned in last year's report was tested again and the result indicates surprising keeping qualities. The vaccine consisted of a broth culture grown six weeks and finally sterilized by the addition of 0.75 per cent phenol. It was stored in a Frigidaire at a temperature of about 10°C and at the time of the last test it was two years old.

384. Doses of 0.5 c.c. and 1.0 c.c. were given hypodermically with one week's interval, and eleven days later a test dose of 0.01 c.c. of living broth culture was injected. Nineteen rats (*C. gambianus*) were taken for the test, but three died in the immunization period. Of the sixteen receiving the test dose ten survived and were killed 29 days after infection. The survival rate was therefore 62 per cent. The average survival period of those infected (allowing 17 days to survivors) was 12.6 days. Eight unvaccinated rats were infected as controls and all died, the average survival period being 2.5 days.

385. The results obtained a year previously were :—survival rate 53 per cent and average survival period 13 days. It would appear therefore that the vaccine had not deteriorated at all on keeping.

APPENDIX B.

Some Notes of Interesting Cases.

By A. S. Burgess, M.D.

386. *Sickle Cell Anaemia.*—This disease has only recently been described in the Gold Coast (Russell and Taylor, W.A.M.J., V. No. 4). West African male age 5 years.

387. Sickling was apparent in dried films, but was much more marked on keeping wet films for a few hours.

Blood Examination.

					Differential count.				
Date.	R.B Cs.	Hb. Per cent.	C.I.	W.B.Cs.	Polymorphonuclears. per cent.	Lymphocytes. per cent.	Large mononuclears. per cent.	Eosinophlis. per cent.	Myelocytes. per cent.
4–8–32	1,450,000	20	0.8	23,000	51	42.5	4	—	2.50
14–9–32	2,730,000	46	0.85	15,200	39.5	47.5	5.5	6.5	1
21–12–32	3,200,000	49	0.75	15,000	43	47.5	0.5	9	—

Fragility Test :—Blood was taken in a paraffined syringe.

Date.				Hæmolysis begins at.	Hæmolysis complete at.
14–9–32	Webb	...	...	0.36 per cent saline.	0.16 per cent saline.
	Control	...	...	0.42 per cent saline.	0.26 per cent saline.
21–9–32	Webb	...	...	0.32 per cent saline.	0.22 per cent saline.
	Control	...	...	0.44 per cent saline.	0. 3 per cent saline.

388. *Lymphatic Leukaemia.*—A. African male age 50 years. Not very ill and not jaundiced ; spleen enormous, viz., a hand's breadth below the umbilical plane, very hard. There were no enlarged lymphatic glands. This was also noted in previous cases.

Blood Examination 9–3–33.

R.B.C. = 2,320,000
H.B. = 51 per cent
Leukocytes 90,000
Differential count —

Polymorphonuclears	3 per cent
Lymphocytes ...	95 per cent.
Large mononuclears	1 per cent
Eosinophils	1 per cent.

Disintegrated forms (Gumprecht's shadows) = 184 per 100 intact leucocytes.

389. *Corrosive sublimate poisoning.*—M.A. An African male, swallowed two Tablets (each 8½ grains) of corrosive sublimate on 12–11–32, suppression of urine occurred on 15–11–32. Flow of urine re-established on 20–11–32 and gradually rose to 89 ozs on 28–11–32.

390. *Laboratory Report :*

Date.	*Blood Urea.*	*Alkali Reserve.*	*Urine Urea.*	
17 November	250 mgs per 100 c.c.	—	—	
19 ,,	200 ,, ,, ,, ,,	—	—	
21 ,,	350 ,, ,, ,, ,,	34.7 vols C.O. 2	—	Albumen 0.2 per cent.
23 ,,	400 ,, ,, ,, ,,	56 do.	—	
24 ,,	—	—	0.85%	(42 ozs in 24 hours)
26 ,,	520 ,, ,, ,, ,,	49.5 do.	1.45%	(23 ozs in 24 hours)
28 ,,	— ,, ,, ,, ,,	—	1.5 %	
29 ,,	500 ,, ,, ,, ,,	—	1.5 %	(65½ ozs in 24 hours)
30 ,,	—	—	1.8 %	
1 December	—	—	1.85%	
2 ,,	560 ,, ,, ,, ,,	69 do.	2.15%	
5 ,,	660 ,, ,, ,, ,,	—	1.6 %	Albumen 0.025 per cent.
6 ,,	— ,, ,, ,, ,,	—	2.1 %	

391. This case was interesting chiefly on account of the very high blood urea which reached 300 mgrms. per 100 c.c. while the patient was suffering from suppression, and then continued to increase up to 660 mgrms when the flow of urine had been re-established and the patient was passing 60–80 ozs of urine per diem with the urea percentage almost normal. Death occurred on 5–12–32.

392. Microscope examination of the Kidney showed: (1) the presence of lime casts; (2) dilatation of the tubules; (3) focal interstitial cell infiltrations. The following is the report :—

393. All the convoluted tubules show a moderate dilatation and have flattened or cubical epithelium. Most of them contain only a little granular material but a good many contain hæmatoxyphil casts (lime casts). The hæmatoxyphil material is seen not only within the lumen but also within the cells lining the tubules.

394. A few hyaline casts also are present.

395. Changes in the malpighian bodies are unimportant. In a few cases there are adhesions between tuft and capsule.

396. Scattered throughout the section are numerous foci of interstitial cell infiltration. The cells, which are not closely packed, include lymphocytes, fibroblasts and plasma cells.

397. There is very little fatty change as shown by frozen sections stained by scarlet red.

APPENDIX C.

List of Reptiles Showing Distribution.

By S. F. Woodward.

	Colony.	Ashanti.	Northern Territories.	Togoland.
Family Typhlopidae.				
Typhlops punctatus (Leach)	Accra, Sekondi	—	—	Yendi.
Family Leptotyphlopidae.				
Leptotyphlopidae (Glaucomia) bicolor (Jan)	Accra	—	—	—
Family Boidae.				
Python regius (Shaw)	Accra, Sekondi	—	Navrongo	Yendi.
Python sebæ (Gmel)	Accra, Sekondi	—	—	—
Family Colubridae.				
A.—Aglypha.				
Natrix ferox (Gunth)	Tarkwa	—	—	—
Boædon lineatus D. and B.	Accra, Sekondi	—	—	Yendi.
Boædon virgatus (Hallow)	Accra, Asamankese.	—	—	—
Boædon fulinginosus (Boie) ...	Accra, Sekondi	—	Wa	—
Prosymna meleagris (Reinh) ...	Accra	—	Wa	—
Dasypeltis scaber (Linn)	Accra, Sekondi	—	—	Yendi.
Chlorophis heterolepidotus (Gunth)	Sekondi	—	—	—
Chlorophis irregularis (Leach) ...	Accra	—	Lawra	—
Chlorophis carinatus (Anderss) ...	—	Kumasi	—	—
Chlorophis heterodermus (Hallow) ...	—	Kumasi	—	
Lycophidium semicinctum D. & B.	Accra	—	Wa	—
Mehelya poensis (Smith)	—	Sunyani	—	—
Gastropyxis smaragdina (Schleg) ...	—	Kintampo and Sunyani	—	—

APPENDIX C—*continued.*

	Colony.	Ashanti.	Northern Territories.	Togoland.
B.—Opisthoglypha.				
Tarbophis variegatus (Reinh) ...	Accra	—	Salaga Wa and Zouaragu	Yendi.
Crotaphopeltis hotamboia (Laur) ...	Accra, Nsawam and Sekondi	—	Lawra, Wa	Yendi.
Boiga blandingii (Hallow)	Sekondi, Koforidua	Sunyani	—	Ho.
Rhamphiophis oxyrhynchus (Reinh)	Accra	—	—	—
Dromophis præornatus (Schleg) ...	Accra	—	—	—
Psammophis sibilans (Linn)	Accra	—	Wa and Pusiga	Yendi and Ho.
Psammophis elegans (Shaw)	Accra	—	Wa	—
Psammophis regularis (Sternf) ...	Nsawam	Sunyani	—	—
Thelotornis Kirtlandii (Hallow) ...	Sekondi.	—	—	—
Calamelaps unicolor (Reinh) ...	Accra	—	—	Yendi.
Dispholidus typus (Smith)	Accra	Sunyani, Kintampo.	—	—
C—Proteroglypha				
Naja nigricollis (Reinh)	Accra	Sunyani	Salaga and Tamale	Yendi, Ho.
Naja melanoleuca (Hallow)	Koforidua	Sunyani	—	—
Dendraspis jamesonii (Traill) ...	Sekondi	—	—	—
Dendraspis viridis (Hallow)	—	—	—	Hohoe.
Elapechis guentheri (Bocage) ...	—	—	Wa	Yendi.
Family Viperidae.				
Causus rhombeatus (Lich)	Accra, Sekondi	Sunyani, Kintampo	Wa, Lawra and Navrongo	Ho.
Bitis arietans (Merr)	Accra, Sekondi	—	Wa	—
Bitis nasicornis (Shaw)	Accra, Sekondi	Kumasi	—	—
Bitis gabonica D. and B.	—	Sunyani	—	Hohoe.
Echis carinatus (Schneid)	—	—	Pusiga	Yendi.
Atractaspis dahomeyensis (Bocage)	Accra	—	—	—
Atractaspis sp : inq :	Accra	Sunyani	Wa	—

398. The reptilian fauna of the Gold Coast have never been thoroughly worked out. The key to the Snakes of West Africa (Boulenger, P.Z.S. 1919) is the only instructive list we have at present.

399. The species enumerated above are the results of a few years collecting, but it is as yet very far from being complete and it is hoped that more material may be sent in, especially from Ashanti, so that a more valuable list may be published in the future.

400. The Yendi collection was made by Dr. H. Hendrie in 1925 and classified by the late Major C. M. Ingoldby. A few outstations sent in material during the year, special mention should be made of Mrs. V. E. Critien, Wa, Northern Territories and Dr. G. W. Vaughan, Sunyani who sent in many specimens of interest.

401. We are again indebted to H. W. Parker, Esq., B.A., British Museum (Natural History) for much help in classification, etc.

TABLE I.

Statistical Return from the Routine Divisions.

Inclusive of repeat Examinations.

Examinations of blood :—	
(*a*) For parasites, total	5,674
1. Malaria	1,444
2. Relapsing fever	—
3. Trypanosomiasis	21
4. Microfilaria	89
5. Negative	4,120
(*b*) Differential and complete counts	172
(*c*) Agglutinations	189
(*d*) Blood cultures	98
(*e*) Wassermann reaction	2,731
(*f*) Chemical examinations, total	238
1. Van den Bergh	22
2. Urea	120
3. Dextrose	77
4. Alkali reserve	19
Examinations of fæces, totals	4,687
(*a*) General examinations	4,493
(*b*) Bacteriological examinations	194
Examinations of urines, totals	3,450
(*a*) General examinations	3,400
(*b*) Bilharzial infections	162
(*c*) Bacteriological examinations	50
Examinations of sputa	902
Miscellaneous and pus examinations	389
Cerebro-spinal fluid examinations	70
Post-mortem examinations	147
Medicolegal examinations	9
Bacteriological examinations of drinking waters	177
Animal examinations and inoculations	161
Rat examinations	1,826

TABLE II.

Post-mortem Examinations.

Broncho-pneumonia	15
Pulmonary oedema	3
Pneumonia, lobar	7
Pneumo-thorax, traumatic	1
Tuberculosis, generalized	5
Tuberculosis, pulmonary	5
Typhoid fever with perforation	2
Typhoid fever	2
Para-typhoid A	1
Septicæmia	2
Septicæmia streptococcal	3
Septicæmia staphylococcal	1
Septicæmia pneumococcal	2
Rupture of uterus	1
Peritonitis, chronic	1
Peritonitis	8
Meningitis, syphilitic	1
Meningitis, influenzal	1
Nephritis, chronic	8
Pyonephritis	2
Cerebral hæmorrhage	3
Status epilepticus	2
Oedematous laryngitis	1
Gangrene of the lungs	2
Uræmia	2
Encephalitis	2
Dysentery, bacillary	2
Dysentery, amœbic	3
Dysentery (unclassified)	1
Toxæmia of pregnancy	1
Burns	1
Aortitis	2
Aortic valvular disease	1
Aortic aneurism	1
Atheroma of aorta and coronary arteries	2
Pericarditis, chronic tubercular	1
Pericarditis, influenzal	1
Carcinoma of liver, primary	1
Osteo-sarcoma	1
Myocardial degeneration	4
Hæmorrhage from duodenal ulceration	1
Poisoning by corrosive sublimate (accidental)	1
Chloroform anæsthesia	2
Chloroform anæsthesia delayed	1
Shock by electricity	1
Shock and hæmorrhage from injuries	15
Fractured skull	4
Wounds, knife	1
Head injuries	3
Senile decay	1
Drowning	4
Hanging	2
Still-birth	2
Undiagnosed	4

TABLE III.

Bacteriological Examinations of Water Supplies.

Source.	Negative.	*B. coli present, specimens enumerated according to smallest volume (c.cs.) in which B. coli found.*					Totals.
		100	10	1	0.1	0.01	
Accra.							
Laboratory tap	39	—	—	—	—	—	39
Storage reservoir No. 1 ...	10	—	—	—	—	—	10
,, ,, No. 2 ...	9	1	—	—	—	—	10
Final Filter No. 1 ...	9	—	—	—	—	—	9
,, ,, No. 2 ...	9	—	—	—	—	—	9
,, ,, No. 3 ...	10	—	—	—	—	—	10
,, ,, No. 4 ...	9	—	—	—	—	—	9
,, ,, No. 5 ...	9	—	—	—	—	—	9
,, ,, No. 6 ...	10	—	—	—	—	—	10
Soda Waters	40	3	2	—	—	—	45
Winneba Water Supplies	4	—	—	—	—	—	4
Abosso Water Supplies ...	2	1	—	—	—	—	3
Nsuta Water Supplies ...	3	—	—	—	—	—	3
Kumasi Water Supplies ...	2	—	—	—	—	—	2
Cape Coast Water Supplies	2	—	—	—	—	—	2
Obuasi Water Supplies ...	—	2	1	—	—	—	3
Totals	167	7	3	—	—	—	177

IX.—SCIENTIFIC.

(*b*) Annual Report of the Analytical Chemist.

402. The total number of samples dealt with was 1,859, an increase of 325 on the previous year's figure, and comprised the following :—

(*a*) *Coroners and Medical Officers.*

Viscera	32	
Medicines	8	
		40

(*b*) *Customs Department.*

Brandy	10	
Geneva	24	
Gin	9	
Liqueur	15	
Rum	16	
Whisky	39	
Beer and stout	81	
Port	27	
Sherry	23	
Tonic and medicated wine	101	
Vermouth	64	
Wine (other kinds)	208	
Medicines (patent and others)	181	
Methylated spirit	17	
Milk	70	
Paint, Varnish, etc.	54	
Perfumery	191	
Miscellaneous	118	
		1,338

(c) *Medical and Health services.*		
Drinking water	15	
Miscellaneous	28	
		43
(d) *Police Department.*		
Illicit spirits	387	
Native medicines	6	
Miscellaneous	22	
		415
(e) *Other departments.*		
Miscellaneous	23	
		23
		1,859

403. The outstanding feature in comparison with the previous year is the enormous increase in the number of samples sent by the Police in connexion with illicit distillation of spirits. In this connexion the almost complete cessation of the importation of methylated spirit (nearly all of the 17 samples—as against 72 in the previous year—were imported by mining companies) seems to afford statistical support to the complete lack of chemical evidence of any use of methylated spirit in the locally distilled spirit.

404. Customs samples show a small increase of 55 over the previous year, thus establishing a new high record.

405. Cases of poisoning presented little of interest, with one exception. This was a case of poisoning with a decoction made by a native doctor from parts of the Ordeal tree (*Erythrophloeum guineense*, also known as Saas tree or Sassy bark). The said native doctor was so convinced of the merits of his preparation that after the death of his patient he took some in order to demonstrate its innocuous nature—and also died. The characteristic alkaloidal poison was isolated from the stomach—contents of both victims and also from the remains of the decoction in the pot.

406. The Miscellaneous work from other departments included the testing of gold from the Treasury, of petrol from the Accra Town Council, of lubricating and fuel oils from the Public Works Department, and of one sample of " Northern Territories Beer " brewed in Accra, to satisfy the curiosity of the Analytical Chemist himself.

407. Mr. R. Simmons, Analytical Chemist, retired on the 28th December, 1932, leaving a vacancy.

D. DUFF,

Director,

Medical and Sanitary Service.

RETURNS.

Table I.—Medical, Health and Laboratory Service Staff on the 1st April, 1932.

	Authorised establishment.	Provision in estimates.	Vacancy.
Director of Medical and Sanitary Service	1	1	—
Deputy Director of Medical Service	1	1	—
Deputy Director of Health Service	1	1	—
Deputy Director of Laboratory Service	—	—	—
Assistant Director of Medical Service	2	1	—
Assistant Director of Health Service	—	—	—
Specialists (one surgical and one medical)	2	2	—
Senior Health Officers	2	2	—
Senior Medical Officers	6	6	—
Senior Pathologist	1	1	—
Pathologists	2	2	—
Medical Officers	35	34	1
Medical Officers of Health	9	9	—
Alienist Officer	1	1	—
Woman Medical Officer	1	1	—
Women Medical Officers (Infant Clinic)	4	4	—
African Medical Officers	4	4	—
Radiographer	1	1	—
Assistant Radiographer	1	1	—
Dental Surgeon	1	1	—
African Government Dentist	1	—	—
Analytical Chemist	2	2	—
Dispensers' Instructor	1	1	—
Medical Storekeeper	1	1	—
Secretary, Gold Coast Hospital	1	1	—
Senior Superintending Sanitary Inspector	1	1	—
Superintending Sanitary Inspectors	19	19	—
Laboratory Assistants	2	2	—
European Nursing Staff.			
Matron	1	1	—
Senior Nursing Sisters	3	3	—
Nursing Sisters	27	26	1
Members of the Subordinate Staff. Medical Branch.			
Chief Dispensers	2	2	—
First Division Dispensers	6	6	—
Second Division Dispensers and Dispensers-in-Training	63	63	1
Laboratory Attendants	2	2	—
Chief Nurses	3	—	—
First Division Nurses	6	6	—
Second Division Nurses and Nurses-in-Training	200	200	—
Midwives-in-Training	6	6	—
Chief Clerk	1	1	—
First Division Clerks	2	2	—
Second Division Clerks	22	22	—
Lodge-Keepers	2	2	—
Telephone Operators	4	4	—
Lunatic Asylum.			
Head Attendant	1	1	—
Assistant Attendant	1	1	—
Mental Nurses	21	21	—
Matron	1	1	—
Gatekeeper	1	1	—
Health Branch.			
Office Assistant and Accountant	1	1	—
First Division Clerks	1	1	—
Second Division Clerks	18	18	—
Sanitary Inspector and Training Officer	1	1	—
Senior Division Sanitary Inspectors	2	2	—
First Division Sanitary Inspectors	5	5	—
Second Division Sanitary Inspectors	88	88	—
Female Sanitary Inspectors	—	—	—
Storekeepers	2	2	—
Disinfector Mechanic	1	1	—
Vaccinators	12	12	—
Senior Village Overseer	1	1	—
Village Overseers	18	18	—
Assistant Disinfector Mechanics	4	4	1
Nurse Midwives	9	9	—
Second Division Dispensers and Dispensers-in-Training	5	5	—
Second Division Nurses and Nurses-in-Training	13	13	—
Health Visitors	4	4	—

TABLE I—*continued.*

	Authorised establishment.	Provision in estimates.	Vacancy.
Engineering Fitter	1	1	—
Market Clerks	3	3	—
CONTAGIOUS DISEASES HOSPITAL.			
Caretaker	1	1	—
Attendants	3	3	—
MEDICAL RESEARCH INSTITUTE.			
Laboratory Attendants	6	6	—
Laboratory Learners	2	2	—
Second Division Clerk	1	1	—

TABLE II.

FINANCE.

Estimated Expenditure for the year 1932-33.

(*a*) PERSONAL EMOLUMENTS.

Medical.

	£	*s.*	*d.*
Administrative Officers	4,300	0	0
Specialists	3,067	0	0
Senior Medical Officers	6,754	0	0
Medical Officers (European and African)	34,172	0	0
Dental Surgeon	939	0	0
European Nursing Staff	13,780	0	0
African Nursing Staff and Dispensers	30,652	0	0
Clerical Staff	3,919	0	0
Various items, allowances, etc.	13,031	0	0
Estimated Total Personal Emoluments	110,614	0	0
Actual Total Personal Emoluments	106,800	4	0

Health.

	£	*s.*	*d.*
Administrative Officers	1,400	0	0
Senior Health Officers and Medical Officers of Health	12,434	0	0
European Sanitary Inspectors	10,061	0	0
African Sanitary Inspectors	14,277	0	0
Various items, allowances, etc.	16,352	0	0
Estimated Total Personal Emoluments	54,524	0	0
Actual Total Personal Emoluments	52,239	8	4

Laboratory Service.

	£	*s.*	*d.*
European Staff	6,343	0	0
African Staff	1,164	0	0
Estimated Total Personal Emoluments	7,507	0	0
Actual Total Personal Emoluments	7,170	16	11

(*b*) OTHER CHARGES.

Medical.

	£	*s.*	*d.*
Passages, transport, etc.	12,310	0	0
Hospital equipment, drugs, medical appliances, surgical instruments, etc.	17,130	0	0
Diets, medical comforts	9,200	0	0
Other items	15,435	0	0
Estimated Total	54,075	0	0
Actual Expenditure	48,448	4	3

TABLE II.

OTHER CHARGES—*continued.*

Health.

Passages, transport, etc.	6,958	0	0
General Health votes	39,442	0	0
Scavengers and labourers	31,668	0	0
Estimated Total	78,068	0	0
Actual Expenditure	69,474	13	0

Laboratory Service.

Passages, transport, etc.	628	0	0
General Research votes	531	0	0
Estimated Total	1,159	0	0
Actual Expenditure	976	17	10
Estimated total expenditure, Medical Department (all branches)	305,947	0	0
Actual total expenditure, Medical Department (all branches) ...	285,110	4	4

Revenue earned by Medical Branch :—

(*a*)	Hospital fees	11,806	1	0
(*b*)	Sale of drugs in private practice	381	5	10
(*c*)	Re-imbursement by Railway Department and Takoradi Harbour	2,350	0	0
	Total	14,537	6	10

Revenue earned by Health Branch :—

(*a*)	Fines for sanitary offences	5,076	0	9
(*b*)	Market and slaughter house fees	8,366	6	5
(*c*)	Poundage fees	330	9	2
(*d*)	Births, deaths and burials	719	0	0
(*e*)	Re-imbursement by Railway Department and Takoradi Harbour	2,968	0	0
(*f*)	Conservancy fees	3,956	11	0
(*g*)	Fees collected at Infant Clinics	3,114	0	10
	Total	24,530	8	2

Table III.

Accurate returns of statistics of population for the year cannot be rendered as the Births and Deaths Registration Districts constitute but a small portion of the Colony and its Dependencies.

Table IV.

(*a*) Meteorology—Average figure for the year 1932–33.

	Temperature.					Rainfall.		Wind.	
	Solar Max.	Min: on Grass.	Shade Max.	Range.	Mean.	Amt. in inches.	Degree of Humidity.	Gen. Dir.	Average Force.
Accra	142.7	71.7	85.7	18	79.5	2.75	74.9	SW	3.5
Kumasi	137.2	—	88.0	26.0	78.0	4.08	85.3	SW	.9
Sekondi	146.9	71.9	89.7	23.0	80.7	2.75	75.1	SW	1.5
Tamale	151.8	65.6	94.0	34.1	80.8	2.99	63.1	SW	1.6
Takoradi	139.5	71.4	88.6	21.6	81.0	2.99	84.2	SW	3.9

(*b*) Meteorological Observations, Laboratory Grounds, Korle Bu, Accra, 9 a.m. Readings, 1932–33.

Month.	Rainfall in inches.	Highest maximun temperature recorded.	Lowest maximun temperature recorded.	Daily average mean. temperature	Temperature of the dew point.	
					Highest	Lowest
April, 1932	3.09	88	74	82.53	78	73
May	6.77	87	75	81.35	78	72
June	7.01	82	72	78.1	75	72
July	0 09	81	72	74.7	73	68
August	0.02	80	70	75.4	73	67
September	1.11	81	71	75.7	74	67
October	5.21	84	74	79	75	72
November	0.48	86	75	80.7	75	72
December	0.39	87	74	87.7	77	63
January, 1933 ...	0.83	87	71	81.1	76	63
February	3.63	87	75	81.9	77	67
March	3.23	88	75	82.5	78	71

Total rainfall 31.86 inches.

Table V.

Return of diseases and deaths (In-patients) and diseases (Out-patients) for the year 1932–33.

Table V.

Return of Diseases and Deaths (In-patients) and Diseases (Out-patients) for the Year 1932-33.

Medical and Health Branches.

Diseases.	In-Patients.				Out-Patients.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.				
I.—*Epidemic, endemic, and infectious diseases.*							
1. Enteric group—							
(*a*) Typhoid fever ...	—	37	8	37	1	20	8
(*b*) Paratyphoid A. ...	—	4	—	4	—	2	—
(*c*) Paratyphoid B. ...	—	2	—	2	—	1	—
(*d*) Type not defined	—	3	1	3	—	1	—
2. Typhus	—	—	—	—	—	—	—
3. Relapsing fever ...	2	25	3	27	—	—	—
4. Undulant fever	—	—	—	—	—	—	—
5. Malaria—							
(*a*) Tertian	1	248	—	249	4	314	130
(*b*) Quartan	—	2	—	2	—	22	23
(*c*) Aestivo-autumnal	19	1,073	13	1,092	27	5,205	2,899
(*d*) Cachexia	1	13	—	14	—	86	45
(*e*) Blackwater ...	1	9	1	10	1	3	—
(*f*) Unclassified ...	1	194	18	195	7	5,223	4,828
6. Smallpox	—	1	—	1	—	4	—
Altastrim	—	1	1	1	—	—	—
7. Measles	1	28	—	29	—	140	96
8. Scarlet fever	—	1	—	1	—	—	—
9. Whooping cough ...	1	8	1	9	—	375	432
10. Diphtheria	—	—	—	—	—	1	—
11. Influenza	—	156	3	156	2	335	72
12. Miliary fever	—	—	—	—	—	—	—
13. Mumps	1	14	—	15	—	23	7
14. Cholera	—	—	—	—	—	—	—
15. Epidemic diarrhoea ...	—	—	—	—	—	1	—
16. Dysentery—							
(*a*) Amœbic	7	206	18	213	8	337	211
(*b*) Bacillary	2	68	16	70	—	54	28
(*c*) Undefined or due to other causes ...	—	61	5	61	3	274	176
17. Plague—							
(*a*) Bubonic	—	—	—	—	—	—	—
(*b*) Pneumonic ...	—	—	—	—	—	—	—
(*c*) Septicæmic ...	—	—	—	—	—	—	—
(*d*) Undefined ...	—	—	—	—	—	—	—
18. Yellow fever	1	3	2	4	—	—	—
19. Spirochætosis ictero-hæmorrhagica ...	—	—	—	—	—	—	—
20. Leprosy	72	62	8	134	88	512	274
21. Erysipelas	—	6	—	6	—	10	6
22. Acute poliomyelitis ...	2	1	—	3	2	8	9
23. Encephalitis lethargica...	—	1	—	1	—	—	—
24. Epidemic cerebro-spinal fever	—	2	2	2	—	1	1
25. Other epidemic diseases—							
(*a*) Rubeolla (German measles) ...	—	5	—	5	—	3	4
(*b*) Varicella (chicken-pox)	13	490	—	503	44	353	48
(*c*) Kala-azar ...	—	—	—	—	—	—	—
(*d*) Phlebotomus fever	—	—	—	—	—	—	—
(*e*) Dengue	—	1	—	1	—	3	—
(*f*) Epidemic dropsy	—	—	—	—	—	—	—
(*g*) Yaws	24	332	7	356	23	34,544	27,653
(*h*) Trypanosomiasis	18	396	47	414	59	210	74
26. Glanders	—	—	—	—	—	—	—
27. Anthrax	—	1	—	1	—	1	—
28. Rabies	—	—	—	—	—	—	—
29. Tetanus	—	45	16	45	1	32	16
30. Mycosis	1	2	—	3	1	82	17
31. Tuberculosis, pulmonary and laryngeal ...	32	307	145	339	19	498	192
32. Tuberculosis of the meninges or central nervous system ...	—	3	—	3	—	2	—

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.				
I.—*Epidemic, endemic and infectious diseases (contd.)*							
33. Tuberculosis of the intestines or peritoneum	—	29	9	29	1	9	4
34. Tuberculosis of the vertebral column ...	3	21	4	24	5	23	12
35. Tuberculosis of bones and joints	2	16	1	18	3	15	6
36. Tuberculosis of other organs—							
(*a*) Skin or subcutaneous tissue (lupus) ...	—	—	—	—	—	—	1
(*b*) Bones ...	1	5	—	6	2	2	1
(*c*) Lymphatic system	2	6	1	8	1	17	7
(*d*) Genito-urinary ...	—	—	—	—	—	—	1
(*e*) Other organs ...	—	3	2	3	1	2	—
37. Tuberculosis disseminated—							
(*a*) Acute	—	1	1	1	—	—	—
(*b*) Chronic	1	2	—	3	1	1	—
38. Syphilis—							
(*a*) Primary	—	14	—	14	—	133	54
(*b*) Secondary... ...	3	21	—	24	1	114	41
(*c*) Tertiary	7	52	8	59	2	118	88
(*d*) Hereditary ...	2	13	3	15	2	33	24
(*e*) Period not indicated	1	31	1	32	1	41	14
39. Soft chancre	8	30	—	38	5	154	8
40. A.—Gonorrhœa and its complications ...	23	256	4	279	11	2,569	500
B.—Gonorrhœal ophthalmia ...	1	39	1	40	1	97	67
C.—Gonorrhœal arthritis	2	67	—	69	7	312	132
D.—Granuloma venereum	—	5	—	5	—	3	3
41. Septicæmia	3	36	28	39	2	14	5
42. Other infectious diseases—Trypanosomiasis ... *See* Item 25 (*h*)							
II.—*General diseases not mentioned above.*							
43. Cancer or other malignant tumours of the buccal cavity ...	1	4	1	5	—	2	—
44. Cancer or other malignant tumours of the stomach or liver ...	—	5	1	5	—	3	4
45. Cancer or other malignant tumours of the peritoneum, intestines, rectum ...	1	5	2	6	—	4	2
46. Cancer or other malignant tumours of the female genital organs	—	8	3	8	—	—	8
47. Cancer or other malignant tumours of the breast	1	6	2	7	—	—	6
48 Cancer or other malignant tumours of the skin ...	—	4	1	4	—	4	—
49. Cancer or other malignant tumours of Organs not classified	1	36	8	37	1	18	13
50. Tumours non-malignant	3	61	—	64	1	167	108
51. Acute Rheumatism ...	—	4	—	4	—	—	2
52. Chronic rheumatism ...	8	126	1	134	4	4,167	1,843
53. Scurvy (including Barlow's disease) ...	—	—	—	—	—	11	7
54. Pellagra	—	—	—	—	—	—	—
55. Beri-beri	—	9	4		2	9	—

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.					OUT-PATIEN	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female
		Admissions.	Deaths.				
II.—*General diseases and not mentioned above (contd.)*							
48. Cancer or other malignant							
55*a* Avitaminosis	—	8	5	8	—	11	4
56. Rickets	—	—	—	—	—	15	9
57. Diabetes (not including insipidus)	—	20	—	20	—	20	5
58. Anæmia—							
(*a*) Pernicious	—	1	—	1	—	3	5
(*b*) Other anæmias and chlorosis	—	62	9	62	4	259	214
59. Diseases of the pituitary body	—	1	—	1	—	—	—
60. Diseases of the thyroid gland—							
(*a*) Exophthalmic goitre	—	1	—	1	—	3	12
(*b*) Other diseases of the thyroid gland, Myxœdema	2	3	1	5	—	31	37
61. Diseases of the parathyroid glands ...	—	—	—	—	—	—	—
62. Diseases of the thymus ...	—	1	1	1	—	—	—
63. Diseases of the suprarenal glands ...	—	—	—	—	—	—	—
64. Diseases of the spleen ...	—	8	2	8	—	54	55
65. Leukæmia—							
(*a*) Leukæmia ...	—	2	—	2	—	1	—
(*b*) Hodgkin's disease	—	—	—	—	—	2	—
66. Alcoholism	1	7	—	8	—	5	1
67. Chronic poisoning by mineral substances (lead, mercury, etc.)	—	—	—		—	4	—
68. Chronic poisoning by organic substances (morphia, cocaine, etc.)	—	1	1	1	—	2	—
69. Other general diseases—							
Auto-intoxication ...	—	1	—	1	—	9	6
Purpura hæmorrhagica	—	4	1	4	—	—	—
Hæmophilia	1	—	1	—	—	1	—
Diabetes insipidus ...	—	—	—	—	—	1	1
69*a* P. U. Origin	—	73	1	73	3	260	52
III.—*Affections of the Nervous System and Organs of the senses.*							
70 Encephalitis (not including encephalitis lethargica)	—	3	1	3	—	4	1
71. Meningitis (not including tuberculous meningitis or cerebrospinal meningitis)	—	17	10	17	—	12	7
72. Locomotor ataxia ...	—	4	—	4	1	11	—
73. Other affections of the spinal cord ...	1	14	3	15	—	14	12
74. Apoplexy—							
(*a*) Hæmorrhage ...	—	21	9	21	—	4	—
(*b*) Embolism ...	—	5	2	5	—	1	—
(*c*) Thrombosis ...	—	7	2	7	—	2	—
75. Paralysis—							
(*a*) Hemiplegia ...	5	56	10	61	8	96	25
(*b*) Other paralyses ...	9	47	7	56	9	72	35
76. General paralysis of the insane	—	3	1	3	1	4	—
77. Other forms of mental alienation	1	504	6	505	347	70	14

TABLE V—*continued.*

Return of Diseases and Deaths (In-Patients) and Diseases (Out-Patients) for the Year 1932–33.

Diseases.	In-Patients.					Out-Patients.	
	Remaining in hospital on 31st Marc , 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.				
III.—*Affections of the nervous system and organs of the senses. (contd.)*							
78. Epilepsy	5	45	2	50	16	83	40
79. Eclampsia, convulsions (non-puerperal) 5 years or over ...	—	3	2	3	—	—	1
80. Infantile convulsions	—	12	5	12	—	31	25
81. Chorea	—	1	—	1	—	1	3
82. A.—Hysteria	1	17	1	18	1	14	19
B.—Neuritis	2	28	—	30	3	356	123
C.—Neurasthenia ...	2	26	1	28	4	114	33
83. Cerebral softening ...	—	4	2	4	—	—	—
84. Other affections of the nervous system, such as paralysis agitans	2	29	—	31	—	351	74
85. Affections of the organs of vision—							
(*a*) Diseases of the eye	11	58	—	69	3	562	303
(*b*) Conjunctivitis ...	9	198	—	207	15	2,938	2,401
(*c*) Trachoma ...	5	34	—	39	—	55	45
(*d*) Tumours of the eye	—	1	—	1	—	38	19
(*e*) Other affections of the eye	11	126	—	137	8	774	290
86. Affection of the ear or mastoid sinus ...	1	46	1	47	3	1,775	1,016
IV.—*Affections of the circulatory system*							
87. Pericarditis	—	13	5	13	—	30	5
88. Acute endocarditis or myocarditis ...	—	12	5	12	—	13	8
89. Angina pectoris ...	—	4	—	4	—	3	4
90. Other diseases of the Heart—	—	7	4	7	—	28	15
(*a*) Valvular— ...	—	20	4	20	3	4	2
Mitral	—	40	11	40	—	84	36
Aortic	—	18	3	18	—	26	9
Tricuspid	—	—	—	—	—	—	—
Pulmonary ...	—	—	—	—	—	—	—
(*b*) Myocarditis ...	3	56	24	59	1	90	34
91. Diseases of the arteries							
(*a*) Aneurism ...	—	8	4	8	—	17	6
(*b*) Arterio-sclerosis ...	—	2	1	2	—	42	17
(*c*) Other diseases ...	—	1	—	1	—	28	7
92. Embolism or thrombosis (noncerebral) ...	—	1	1	1	—	—	—
93. Diseases of the veins—							
Hæmorrhoids ...	2	48	—	50	6	259	68
Varicose veins ...	—	1	—	1	—	21	3
Phlebitis	—	8	—	8	1	13	1
94. Diseases of the lymphatic system—							
Lymphangitis ...	—	8	—	8	—	66	18
Lymphadenitis, bubo (non-specific) ...	5	197	2	202	6	584	148
95. Hæmorrhage of undetermined cause ...	—	10	2	10	—	11	4
96. Other affections of the circulatory system	—	6	2	6	—	16	7

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932-33.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.				
V.—*Affections of the respiratory system.*							
97. Diseases of the nasal passages—							
Adenoids	—	6	—	6	—	22	15
Polypus	—	2	—	2	—	6	37
Rhinitis	—	4	—	4	—	130	271
Coryza...	1	40	—	41	1	1,435	301
Ill-defined	—	—	—	—	—	5	3
98. Affections of the larynx	—	—	—	—	—	—	27
Laryngitis	—	12	2	12	—	122	17
99. Bronchitis—							
(*a*) Acute	10	300	6	310	9	4,094	2,081
(*b*) Chronic	2	74	—	76	1	2,359	1,278
100. Broncho-pneumonia ...	6	158	74	164	3	178	123
101. Pneumonia—							
(*a*) Lobar	12	284	88	296	16	215	96
(*b*) Unclassified ...	—	50	20	50	1	59	25
102. Pleurisy, empyema ...	4	126	6	130	6	278	85
103. Congestion of the lungs	—	6	3	6	1	58	21
104. Gangrene of the lungs ...	—	2	—	2	—	—	—
105. Asthma	2	60	2	62	1	133	62
106. Pulmonary emphysema	—	—	—	—	—	21	3
107. Other affections of the lungs	—	12	2	12	—	8	1
Pulmonary spirochaetosis	—	—	—	—	—	—	—
VI.—*Diseases of the digestive system.*							
108. A.—Diseases of teeth or gums—							
Caries, pyorrhœa, etc.	2	81	1	83	4	2,017	1,075
B.—Other affections of the mouth	—	16	8	16	—	18	2
Stomatitis	—	45	—	45	2	542	392
Glossitis, etc. ...	—	22	1	22	—	267	226
109. Affections of the pharynx or tonsis—							
Tonsilitis	—	73	1	73	4	389	214
Pharyngitis	1	31	1	32	—	450	155
110. Affections of the œsophagus	—	—	—	—	—	11	6
111. A.—Ulcer of the stomach	—	10	2	10	1	8	—
B.—Ulcer of the duodenum	—	5	2	5	—	7	—
112. Other affections of the stomach	—	—	—	—	—	—	2
Gastritis	—	52	—	52	—	304	116
Dyspepsia, etc. ...	2	35	—	37	—	1,157	683
113. Diarrhœa and enteritis— Under two years ...	1	95	11	96	—	668	572
114. Diarrhœa and enteritis— Two years and over ...	12	269	16	281	7	1,637	816
Colitis	—	51	3	51	—	210	71
Ulceration	—	7	1	7	—	2	—
114*a* Sprue	—	—	—	—	—	—	—
115. Ankylostomiasis ...	3	116	9	119	3	123	70
116. Diseases due to intestinal parasites—							
(*a*) Cestoda (tænia) ...	3	41	1	44	—	804	290
(*b*) Tremotoda (flukes)	—	—	—	—	—	19	—
(*c*) Nematoda (other than ankylostoma)	—	2	1	2	—	3	—
Ascaris	5	138	3	143	3	796	855

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.				
VI.—*Diseases of digestive system—(contd.)*							
Trichocephalus dispar	—	—	—	—	—	—	—
Trichina	—	—	—	—	—	11	3
Dracunculus ...	26	315	2	341	9	789	207
Strongylus ...	—	1	—	1	—	21	11
Oxyuris	—	3	—	3	—	15	13
(*d*) Coccidia	—	—	—	—	—	—	2
(*e*) Other parasites ...	—	16	5	16	—	143	34
(*f*) Unclassified ...	—	18	1	18	—	9	4
117. Appendicitis	3	17	2	20	—	10	10
118. Hernia	15	194	17	209	15	421	17
119. A.—Affections of the anus, fistula, etc. ...	10	81	1	91	12	120	70
B.—Other affections of the intestines ...	—	11	3	11	—	—	1
Enteroptosis	—	1	—	1	—	130	44
Const pation	—	300	4	300	5	7,605	2,263
120. Acute yellow atrophy of the liver	—	—	—	—	—	—	—
121. Hydatid of the liver ...	—	1	1	1	—	—	—
122. Cirrhosis of the liver—							
(*a*) Alcoholic	—	2	1	2	—	2	—
(*b*) Other forms ...	1	17	5	18	—	21	5
123. Biliary calculus	—	—	—	—	—	—	—
124. Other affections of the liver	—	—	—	—	—	4	—
Abscess	—	26	6	26	1	21	5
Hepatitis	2	49	—	51	1	114	39
Cholecystitis	—	—	—	—	—	8	4
Jaundice	3	56	2	59	2	83	35
125. Diseases of the pancreas	—	—	—	—	—	5	3
126. Peritonitis (of unknown cause)	—	30	17	30	1	6	6
127. Other affections of the digestive system ...	—	12	1	12	—	29	27
VII.—*Disease of the genito-urinary system (non-venereal).*							
128. Acute nephritis	4	78	28	82	2	81	51
129. Chronic nephritis ...	2	87	24	89	6	84	55
130. A.—Chyluria	—	1	—	1	—	1	1
B.—Schistosomiasis ...	—	128	8	128	12	318	74
131. Other affections of the kidneys	1	2	—	3	—	8	2
Pyelitis, etc.	3	28	2	31	1	22	15
132. Urinary calculus ...	—	6	1	6	—	9	6
133. Diseases of the bladder	—	1	—	1	1	2	1
Cystitis	6	99	7	105	6	192	162
134. Diseases of the urethra—	—	—	—	—	—	19	—
(*a*) Stricture	6	169	6	175	9	222	7
(*b*) Other	7	64	7	71	1	166	6
135. Diseases of the prostate—							
Hypertrophy	—	2	—	2	—	6	—
Prostatitis	2	27	1	29	2	95	—
136. Diseases (non-venereal) of the genital organs of man—	1	3	—	4	1	35	—
Epididymitis	2	46	—	48	—	113	—
Orchitis	1	72	—	73	2	188	—
Hydrocele	1	72	—	73	8	211	—
Ulcer of penis ...	3	83	—	86	4	238	—
Phimosis and paraphimosis	6	109	—	115	4	222	—

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.			
VII.—*Diseases of the genito-urinary system (non-venereal) (contd.)*						
137. Cysts or other non-malignant tumours of the ovaries ...	—	8	1	1	—	24
138. Salpingitis	2	63	—	2	—	39
Abscess of the pelvis	—	18	2	—	—	110
139. Uterine tumours (non-malignant)	4	30	—	3	—	65
140. Uterine hæmorrhage (non-puerperal) ...	—	6	—	—	—	59
141. A.—Metritis	4	41	—	2	—	391
B.—Other affections of the female genital organs— ...	5	92	3	3	—	111
Displacements of uterus	2	11	—	—	—	101
141. B.—Other affections of the female genital organs—	—	—	—	—	—	—
Amenorrhœa ...	—	—	—	—	—	177
Dysmenorrhœa ...	—	14	—	1	—	516
Leucorrhœa ...	—	26	—	1	—	226
142. Diseases of the breast (non-puerperal) ...	—	4	—	—	—	—
Mastitis	—	12	—	—	13	100
Abscess of breast ...	—	5	—	—	—	17
VIII.—*Puerperal State.*						
143. Normal labour ...	9	707	24	9	—	437
143a Maternal welfare— (antenatal) ...	8	443	—	18	—	12,718
B.—Accidents of pregnancy—						
(*a*) Abortion ...	3	139	2	1	—	127
(*b*) Ectopic gestation	—	4	1	—	—	1
(*c*) Other accidents of pregnancy ...	5	159	19	4	—	73
144. Puerperal hæmorrhage	1	13	1	—	—	1
145. Other accidents of parturition ...	7	232	13	—	—	23
146. Puerperal septicæmia	1	25	8	—	—	13
147. Phlegmasia dolens ...	—	1	—	—	—	—
148. Puerperal eclampsia	—	8	2	—	—	4
149. Sequelæ of labour ...	—	43	3	—	—	25
149a Post-natal examinations mothers and infants	1	29	—	1	—	3,212
150. Puerperal affections of the breast	—	10	—	—	—	4
IX.—*Affections of the skin and cellular tissues.*						
151. Gangrene	2	29	6	3	57	9
152. Boil—	4	117	—	5	673	192
Carbuncle	1	60	2	1	602	234
153. Abscess—	14	358	5	10	545	181
Whitlow	—	66	—	3	435	121
Cellulitis	14	452	23	17	974	233
154. A.—Tinea	1	17	—	—	1,151	606
B.—Scabies	6	58	—	4	1,954	1,266
155. Other diseases of the skin— ...	2	45	2	1	1,446	1,050
Erythema ...	—	4	—	—	156	89
Urticaria ...	—	20	—	1	310	119
Eczema ...	—	26	—	1	1,079	680

TABLE—V*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.			
IX.—*Affections of the skin and cellular tissues—(contd.)*						
Herpes	—	13	1	—	156	26
Psoriasis	—	—	—	—	12	3
Elephantiasis ...	—	38	1	2	124	26
Myiasis	—	—	—	—	3	1
Chigers	—	4	—	—	19	4
Cutaneous leishmaniasis	—	—	—	—	—	—
155a Ulcers	99	915	12	98	6,677	3,065
X.—*Diseases of bones and organs of locomotion (other than tuberculous).*						
156. Diseases of bones ...	—	5	—	—	5	—
Osteitis	7	55	5	3	296	193
157. Diseases of joints— ...	—	—	—	—	10	4
Arthritis	10	208	4	8	1,115	339
Synovitis	7	84	2	7	346	96
158. Other diseases of bones or organs of locomotion	5	149	4	17	1,112	397
XI.—*Malformations.*						
159. Malformations— ...	—	9	—	—	4	3
Hydrocephalus ...	—	5	2	—	9	9
Hypospadias	—	—	—	—	2	—
Spina bifida, etc. ...	—	5	1	—	2	5
XII.—*Diseases of infancy.*						
160. Congenital debility ...	—	48	24	1	78	52
161. Premature birth ...	—	15	4	—	11	12
162. Other affections of infancy	3	16	1	—	73	73
163. Infant neglect (infants of three months or over)	—	81	29	1	338	314
163a New-born infants ...	12	824	57	20	933	1,119
XIII.—*Affections of old age.*						
164. Senility—	1	9	7	1	27	27
Senile dementia ...	1	6	3	4	9	11
XIV.—*Affections produced by external causes.*						
165. Suicide by poisoning ...	—	3	—	—	—	—
166. Corrosive poisoning (intentional) ...	—	5	2	—	2	1
167. Suicide by gas poisoning	—	—	—	—	—	—
168. Suicide by hanging or strangulation ...	—	1	—	—	4	1
169. Suicide by drowning ...	—	—	—	—	—	—
170. Suicide by firearms ...	—	—	—	—	—	—
171. Suicide by cutting or stabbing instruments	—	7	3	—	—	—
172. Suicide by jumping from a height	—	—	—	—	—	—
173. Suicide by crushing ...	—	—	—	—	—	—
174. Other suicides	—	1	—	—	—	—
175. Food poisoning— ...	—	4	—	—	5	1
Botulism	—	—	—	—	1	1

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Female.
		Admissions.	Deaths.				
XIV.—*Affections produced by external causes (contd.)*							
176. Attacks of poisonous animals—							
Snake bite	—	50	3	50	—	44	6
Insect bite	2	36	—	38	—	127	16
177. Other accidental poisonings	—	21	1	21	—	13	9
178. Burns (by fire)	5	69	8	74	4	215	111
179. Burns (other than by fire)	4	37	4	41	1	109	51
180. Suffocation (accidental)	—	1	—	1	—	—	—
181. Poisoning by gas (accidental)	—	—	—	—	—	—	—
182. Drowning (accidental) ...	—	—	—	—	—	—	—
183. Wounds (by firearms, war excepted)	16	135	10	151	4	73	6
184. Wounds (by cutting or stabbing instruments)	37	594	17	631	22	2,907	503
185. Wounds (by fall) ...	6	265	8	271	11	1,285	248
186. Wounds (in mines or quarries)	1	258	1	259	20	1,177	27
187. Wounds (by machinery)	1	17	—	18	2	243	19
188. Wounds (crushing, e.g. railway accidents, etc.)	17	389	20	406	11	566	92
189. Injuries inflicted by animals—bites, kicks, etc.	2	85	7	87	3	227	95
190. Wounds inflicted on active service ...	—	—	—	—	—	—	—
191. Executions of civilians by belligerents ...	—	—	—	—	—	—	—
192. A.—Over fatigue ...	—	4	1	4	—	2	1
B.—Hunger or thirst ...	3	27	10	30	2	5	1
193. Exposure to cold, frost bite, etc.	—	—	—	—	—	—	—
194. Exposure to heat—							
Heatstroke	—	—	—	—	—	3	—
Sunstroke	—	—	—	—	—	—	—
195. Lightning stroke ...	—	—	—	—	—	—	—
196. Electric shock	—	2	—	2	—	4	—
197. Murder by firearms ...	—	—	—	—	—	—	—
198. Murder by cutting or stabbing instruments	—	—	—	—	—	—	2
199. Murder by other means	—	2	2	2	—	—	1
200. Infanticide (murder of an infant under one year)	—	—	—	—	—	—	—
201. A.—Dislocation	—	27	3	27	1	63	18
B.—Sprain	2	94	—	96	1	559	74
C.—Fracture	33	369	21	402	35	267	47
202. Other external injuries	5	294	9	299	4	2,155	550
203. Deaths by violence of unknown cause ...	—	—	—	—	—	—	—
XV.—*Ill-defined diseases.*							
204. Sudden death (cause unknown)	—	—	—	—	—	—	1
205. A.—Diseases not already specified or ill-defined—							
Ascites	4	46	6	50	1	43	23
Œdema	1	26	1	27	6	58	23
Asthenia	2	118	31	120	10	481	168
Shock	—	8	1	8	—	24	10
Hyperpyrexia ...	1	13	3	14	—	11	1
Other Diseases ...	—	70	16	70	1	241	217
B.—Malingering ...	—	18	—	18	—	162	11
C.—Observation cases ...	1	131	—	132	16	144	38

TABLE V—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND DISEASES (OUT-PATIENTS) FOR THE YEAR 1932–33.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in hospital on 31st March, 1932.	Yearly Total.		Total cases treated.	Remaining in hospital on 31st March, 1933.	Male.	Fem
		Admissions.	Deaths.				
XVI.—*Diseases, the total of which have not caused ten deaths.*	28	39	1	67	26	171	30
Total ...	935	20,291	1,434	21,226	1,390	128,621	90,209

Surgical operations :—

Major ... ... 1,030 Minor 2,288

TABLE VI.

	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining on 31st March, 1932.	Admissions.	Deaths.	Total cases treated.	Remaining on 31st March, 1933.	Male.	Female.
Medical Branch	811	18,456	1,210	19,267	1,220	113,354	74,249
Health Branch—							
Infant clinics	39	1,210	189	1,249	42	14,281	15,503
Contagious diseases hospitals	85	625	35	710	128	986	457
	935	20,291	1,434	21,226	1,390	128,621	90,209

APPENDICES.

APPENDIX A.

GOVERNMENT HOSPITAL BED ACCOMMODATION AND DISPENSARIES, GOLD COAST COLONY, ASHANTI, NORTHERN TERRITORIES AND BRITISH MANDATED TOGO, MEDICAL BRANCH.

COLONY.	HOSPITAL.		EUROPEAN.				AFRICAN.				Dispensaries.	Medical staff (Medical officers and women Medical officers).	REMARKS.
	European.	African.	Total Beds at present.		Number of Beds possible.		Total Beds at present.		Number of Beds possible.				
			M.	F.	M.	F.	M.	F.	M.	F.			
Accra	1	1	17	3	17	3	163+15 cots	43+2 cots	163+20 cots	43+12 cots	2	5 (M.Os.)	
Accra Cantonments	—	1	—	—	—	—	6	—	8	—	1	1 (M.O.)	
Accra Maternity	—	1	—	—	—	—	—	28+24 cots	—	15+15 cots	—	1 (W.M.O.)	
Accra Princess Marie Louise ...	—	1	—	—	—	—	—	3+19 cots	—	6+30 cots	1	1 (W.M.O.)	A children's Hospital.
Accra Christiansborg	—	—	—	—	—	—	—	—	—	—	1	1 (W.M.O.)	Infant Welfare Clinic.
Sekondi	—	1	—	—	—	—	46+2 cots	9+2 cots	46+2 cots	9+2 cots	1	2 (M.Os.)	
Sekondi	—	—	—	—	—	—	—	—	—	—	1	1 (W.M.O.)	Infant Welfare Clinic.
Takoradi	1	—	16	4	16	4	—	—	—	—	1	1 (M.O.)	
Chama	—	—	—	—	—	—	—	—	—	—	—	1 (W.M.O.)	Infant Welfare Clinic, visited by W.M.O.
Cape Coast	1	1	2	—	3	—	22	18	24	22	1	1 (M.O.)	
Cape Coast	—	—	—	—	—	—	—	—	—	—	1	1 (W.M.O.)	Infant Welfare Clinic.
Saltpond	—	1	—	—	—	—	8	4	8	4	1	1 (M.O.)	
Winneba	1	1	7	1	7	1	28	22+6	32	28+6	1	1 (M.O.)	
Ada	—	1	—	—	—	—	4	4	4	4	1	1 (M.O.	
Keta	—	1	—	—	—	—	13	4	13	4	1	1 (M.O.)	
Kibi...	—	1	—	—	—	—	16	4	16	4	1	1 (M.O.)	
Mpraeso	—	1	—	—	—	—	8	6	8	8	1	1 (M.O.)	
Dunkwa	—	1	—	—	—	—	15	8	17	8	1	1 (M.O.)	
Tarkwa	—	1	—	—	—	—	11	—	11	—	—	1 (M.O.)	
Axim	1	1	4	2	4	2	12	4	12	4	1	1 (M.O.)	
Wiawso	—	1	—	—	—	—	7	1	11	4	1	1 (M.O.)	Visited occasionally by M.O.
Akuse	—	1	—	—	—	—	12	6	12	8	1	1 (M.O.)	
Koforidua	—	1	—	—	—	—	13	6	13	6	1	1 (M.O.)	
Koforidua	—	—	—	—	—	—	—	—	—	—	1	1 (W.M.O.)	Infant Welfare Clinic
Elmina	—	1	—	—	—	—	—	—	—	—	1	1 (M.O.)	Visiting from Cape Coast.
Oda	—	1	—	—	—	—	12	4	12	4	1	1 (M.O.)	
Nsawam	—	1	—	—	—	—	10	4	10	4	1	1 (M.O.)	
Total	5	21	46	10	47	10	406+17 cots	178+53 cots	420+22 cots	185+65 cots	25	32	

GOVERNMENT HOSPITAL BED ACCOMMODATION AND DISPENSARIES, GOLD COAST COLONY, ASHANTI, NORTHERN TERRITORIES AND BRITISH MANDATED TOGO, MEDICAL BRANCH.

ASHANTI.	HOSPITAL.		EUROPEAN.				AFRICAN.				Dispensaries.	Medical staff (Medical officers and women Medical officers).	REMARKS.
	European.	African.	Total Beds at present.		Number of Beds possible.		Total Beds at present.		Number of Beds possible.				
			M.	F.	M.	F.	M.	F.	M.	F.			
Kumasi	1	1	10	1	10	1	105	33+2 cots	105	33+2 cots	1	3 (M.Os.)	
Kumasi	—	1	—	—	—	—	—	26 cots	—	26 cots	1	1 (W.M.O.)	Infant Welfare Clinic.
Bekwai	—	1	—	—	—	—	6	4	6	4	1	1 (M.O.)	
Sunyani	—	1	—	—	—	—	12	4	12	4	1	1 (M.O.)	
Kintampo	—	1	—	—	—	—	16	14	16	14	1	1 (M.O.)	Closed 20-6-32.
Total	1	5	10	1	10	1	139	55+28 cots	139	55+28 cots	5	7	

NORTHERN TERRITORIES.	HOSPITAL.		EUROPEAN.				AFRICAN.						
	European.	African.	M.	F.	M.	F.	M.	F.	M.	F.			
Tamale	1	1	4	2	4	2	36	8	36	8	1	2 (M.Os.)	
Wa	—	1	—	—	—	—	12	5	12	5	1	1 (M.O.)	
Lawra	—	1	—	—	—	—	12	4	12	4	1	1 (M.O.)	
Zuarungu	—	—	—	—	—	—	—	—	—	—	1	—	Visiting from Navrongo.
Salaga	—	1	—	—	—	—	8	2	8	2	1	1 (M.O.)	
Navrongo	—	1	—	—	—	—	8	4	8	4	1	1 (M.O.)	
No. 1 Travelling Dispensary ...	—	—	—	—	—	—	—	—	—	—	1	—	
No. 2 Travelling Dispensary ...	—	—	—	—	—	—	—	—	—	—	1	—	
No. 3 Travelling Dispensary ...	—	—	—	—	—	—	—	—	—	—	1	1 (M.O.)	
	1	5	4	2	4	2	76	23	76	23	9	7	

APPENDIX A—*contd.*

Government Hospital Bed Accommodation and Dispensaries, Gold Coast Colony, Ashanti, Northern Territories and British Mandated Togo, Medical Branch.

Colony.	Hospital.		European.				African.				Dispensaries.	Medical staff (Medical officers and women Medcal officers).	Remarks.
	European.	African.	Total Beds at present.		Number of Beds possible.		Total Beds at present.		Number of Beds possible.				
			M.	F.	M.	F.	M.	F.	M.	F.			
Ho	—	1	—	—	—	—	13	5	14	5	1	1 (M.O.)	
Kete Krachi	—	—	—	—	—	—	—	—	—	—	1	1 (M.O.)	Visited occasionally by M.O.
Yendi	—	1	—	—	—	—	9	5	10	5	1	1 (M.O.)	
Total	—	2	—	—	—	—	22	10	24	10	3	3	
Grand Total	7	33	60	13	61	13	643+17 cots	226+81 cots	659+22 cots	273+93 cots	42	49	

Contagious Diseases Hospital—Health Branch.

British Mandated Togo (Colony).	Hospital.		European.				African.						
	European.	African.	M.	F.	M.	F.	M.	F.	M.	F.			
Labadi	1	1	—	—	4	—	31	23	80	62	—	1 (M.O.H.	Visiting.
Cape Coast	—	1	—	—	—	—	5	4	13	13	—	1 (M.O.H.)	Visiting.
Sekondi	—	1	—	—	—	—	3	—	26	24	—	1 (M.O.H.)	Visiting.
Tarkwa	—	1	—	—	—	—	—	—	5	1	—	1 (M.O.H.)	Visiting.
Winneba	—	1	—	—	—	—	—	—	2	2	—	1 (M.O.H.)	Visiting.
Ada	—	1	—	—	—	—	—	—	4	4	—	1 (M.O.H.)	Visiting.
Saltpond	—	1	—	—	—	—	2	—	4	—	—	1 (M.O.H.)	Visiting.
Kumasi	—	1	—	—	—	—	15	9	15	9	—	1 (M.O.H.)	Visiting.
Keta	—	1	—	—	—	—	2	2	4	2	—	1 (M.O.H.)	Visiting.
Total	1	9	—	—	4	—	58	38	153	117	—	9	

*The number of beds pos ible is a variable figure. It can in case of outbreak be largely increased.

APPENDIX 2.—REPORTS OF INTERESTING CASES.

I.—Hæmoglobinuria initiated by the Ingestion of Naphthaline.

By Dr. S. L. Brohier, Senior Medical Officer.

408. Name : Peter Kwamin. Aged 25 years.

Residence : Kurankan.

Tribe : Krobo.

Brought to hospital 15th November, 1932, with a complaint of pain and general discomfort in the abdomen. Marked muscular weakness and an inability to stand. Temperature 101.4°.

409. *History of illness.*—Felt ill on the 11th instant—followed his usual occupation as a farmer until this date. Illness started with a rigor. Headache, fever and vomiting, also general discomfort in abdomen for which he took a purgative without result. Was then advised by a friend to take a certain medicine ; he purchased three pills and took two on the evening of the 11th. On the 12th he passed black urine ; felt pain in the abdomen and found himself unable to use his legs on account of weakness. On being asked to produce a sample of the pills he took he produced a ball of naphthaline (the ordinary moth ball of commerce).

410. *Present condition.*—Tenderness over epigastrium and over liver. Liver one finger breadth below costal margin. Spleen not palpable. Tenderness over bladder region. Marked weakness in legs but muscular power appears quite unimpaired, he is able to push away a hand forcibly with his foot, but there appears to be incoordination on attempting to stand up. Knee jerks absent. No plantar reflex ; no babinski reflex. No evidence of a sore on penis. Inguinal and epitrochlear glands not enlarged. Urine six ozs. passed. Porter coloured albumin + with small deposit consisting of granular debris ; no casts, a few leucocytes, no evidence of red blood cells.

411. *Spectroscopically* there is a broad absorption band suggestive of the band of *acid hæmatin.*

412. *Blood examination.*—Marked anæmia, many nucleated red cells and poikilocytes with evidence of a ploymorpho-nuclear leucocytosis. Scanty subtertian ring forms seen. Admitted. Evening temperature 102°.

413. *Treatment.*—Enema saponis statim—followed by glucose-saline per rectum. Imperial drink *ad libitum.* Quinine byhydrochlor 9 grs. intramuscularly. Hot bottles to loins. Blankets.

414. 16*th November*, 1932.—Morning temperature 101°. Total urine since admission 20 oz. Urine darker, heavy dirty brown deposit on standing. Deposit shows granular débris and a few casts and leucocytes. Reaction strongly acid.

415. General condition much the same as before ; lies quietly in bed, appears rather exhausted, complains of slight pain in loins. No jaundice. Blood :—Young rings (S.T.) still present. Evening temperature 99.4°.

416. 17*th November*, 1932.—Morning temperature 97.6°. Urine continues as black as ever but deposit much less. Spectroscopically the band is that of acid hæmatin. The deposit consists of granular débris with large numbers of squamous epithelial cells from the bladder. Total urine 17 oz. Albumen more definite with a heavy cloud of phosphates on boiling. Evening temperature 98.2°. Patient appears more comfortable.

417. 18*th November*, 1932.—Morning temperature 98°. Total urine 24 oz. ; much clearer ; port wine coloured ; very slight deposit, consisting of granular casts and débris, but casts are very few. Evening temperature 98.6°. The patient appears content to lie in bed.

418. *19th November*, 1932.—Morning temperature 98°. The patient feels much better. Total urine 33 oz. Urine dark straw coloured with practically no deposit, but casts are more numerous. Albumen still present. Feels quite comfortable and has no complaint to make.

419. *20th November*, 1932.—Feels well. Total urine 42 oz. Albumen and casts still present. Muscular power has returned.

420. *21st November*, 1932.—Total urine 60 oz. Doing well, appetite good.

421. *22nd November*, 1932.—Total urine 45 oz. Is well and desires to leave hospital. Discharged.

422. *Remarks.*—Whilst the presence of subtertian malarial parasites in the blood suggests the possibility that this was a case of ordinary blackwater fever, the history of the ingestion of naphthaline and the marked muscular weakness appear to suggest a case of poisoning by naphthaline rather than an ordinary case of blackwater fever.

II.—Report upon the after History of a case of Acute Rheumatism reported at Tamale in the Annual Report for the year 1930–31.

By Dr. A. M. Gillespie, Medical Officer.

423. The patient, Dawuni Dagomba, suffered from an attack of acute rheumatism in 1930 and a full report on the case was given in the Annual Report for the year 1930–31 on page 171.

424. It was definitely known that the boy was quite healthy before the attack. He was seen on the second day of the disease and the cause and clinical features left little doubt as to the diagnosis.

425. In January, 1933, i.e. three years after the original attack, he came to see me at Bekwai in search of work. He had left school at Standard IV and was aged 14 years. His general physical condition was good and he did not complain of any disability.

426. Upon examining the heart, however, it was interesting to note that the apex beat was in the 8th interspace $2\frac{3}{4}$" from the mid-line. The right border of the heart was not appreciably enlarged. There was no thrill on palpation. On auscultation there was a soft blowing murmur over the mitral area which was propagated round into the axilla.

427. The cardiac lesion present three years after the original attack of the disease is of great interest as being one more point in support of the diagnosis of acute rheumatism and this further note is considered worthy of record as the disease is, so far as is known at present, not common in West Africa.

III.—Report on a case of Acute Rheumatism at Bekwai.

By Dr. A. M. Gillespie, Medical Officer.

428. The patient, Kojo Gbekoh, a male school boy aged about 18 years, was admitted to the African Hospital, Bekwai, on 19–11–32. He had been ill for four days and complained of fever and severe pains in the right knee joint and the left elbow and shoulder. The illness had commenced suddenly on the afternoon of 15–11–32 when he had an attack of fever and severe pain in the right knee, by next morning the pain in the knee was less severe but the left elbow was very painful and tender. He perspired profusely and had some headache.

429. On 18th November, 1932 the pain had almost subsided in the right knee and was improved in the left elbow. About noon the left ankle became painful and swollen and he did not sleep during the night. On admission the temperature was 102.4°, respiration 22 and pulse rate 120, regular in time full and of low tension. The patient had an anxious expression and was most apprehensive of any attempt at examination. The left elbow and ankle were slightly swollen, very painful and

acutely tender to touch on movement, so much so that he cried out when an attempt was made to move the affected joints. He complained of headache, the tongue was dry and coated. The bowels had not moved for two days. The teeth were healthy and tonsils were not enlarged.

430. *Circulatory system.*—Pulse regular in time, full and of low tension and 120 per minute.

Heart.—There was pulsation in the epigastric area; no thrill on palpation and the apex beat was in the 5th interspace 3" from the mid-line. The borders were not enlarged. There was a soft blowing mitral systolic murmur which was propagated into the axilla and could be heard behind the left shoulder blade. There was also a soft murmur in the pulmonary area. The aortic and tricuspid sounds were somewhat muffled.

431. *Respiratory system.*—There was nothing abnormal to note.

432. *Liver.*—Not enlarged or tender. Spleen not palpable. *Urine.* Acid amber: sp. gr. 1022 no albumen or sugar present. No casts. *Blood.* Hb 70. No parasites were seen on examination.

433. *Nervous system.*—Nothing abnormal to note.

434. During the night of 19th November, 1932, he did not sleep and developed pain in the right shoulder. There was no history of previous illness.

435. *Treatment.*

(1) A saline purge was given on admission.

(2) ℞ Sod. Bicarb ... ... grs. xx
Sod. Salicyl. ... ... grs. xv
Syr. Aurantii ... min. xv.
Aqua ... ... ad ℥ 4 hourly in water.

(3) ℞ Tr. Digitalis ... ... min. x
Tr. Nucis vomicae ... min. x
Aqua chlorof ... ... ad ℥ thrice daily in water.

(4) Quinine, grs. v, was given nightly.

(5) Ung. Methyl. salicyl. was applied to the painful joints on lint and they were wrapped in cotton wool.

436. On the morning of 20th November, 1932, the temperature was 100.2 and pulse rate 100. The same evening the temperature went up to 102.6. The pulse was 120 and the condition much the same.

437. By 21st November, 1932, there was a slight improvement in the general condition. The temperature was 100 and the local conditions were not so painful. He perspired freely and slept well during the night.

438. On 22nd November, 1932, the temperature went up to 102.8 and the pulse rate was 120. There was marked pain in the right shoulder and left ankle. He complained of pain and a feeling of constriction in the precordial region. There was a slight thrill on palpation over this area and the left border of the heart was enlarged down and out, the apex beat being in the 6th interspace 3¼" from the mid-line. The right border was ½" from the edge of the sternum. On auscultation the cardiac sounds were muffled and there was slight friction heard over the base of the heart. Antiphlogistine was applied over the precordial area. During the course of the day the respiration became slightly embarrassed and the rate increased to 30 per minute and the pulse rate 130. By evening the temperature was 102, the friction had disappeared and the apex beat was somewhat less well defined. The mitral murmur was less pronounced and the sound muffled. There was some improvement in the joint pains and he slept well during the night perspiring profusely.

439. By 23rd November, 1932, there was some improvement in the general condition, the temperature was 100, respiration 28 and pulse rate 30. The joint pains were much less severe, he was less apprehensive of any attempt to examine

the affected joints and was more comfortable although movement was impossible owing to the pain it caused. He had lost the anxious expression and the appetite which had been very poor was much improved. In the evening the temperature was 99.8, respiration 22 and pulse 120. There was little change in the heart condition although the precordial distress was much less marked.

440. In the evening the temperature was 99.4, respiration 22, and pulse rate 110. He had a good night's rest and on 24th November, 1932, the improvement was maintained. Temperature 99, respiration 22, pulse rate 112. There was little precordial distress and the general condition of the joints was better. During the course of the afternoon he complained of buzzing in the ears and the dose of sodium salicylate was reduced to grs. viiss. The heart condition was a little improved. The evening temperature was 99.4, pulse 120, respiration 24.

441. On 26th November, 1923, there was a recurrence of pain in the left knee and right elbow. The dose of sod. salicylate was increased to grs. xv and by evening there was a considerable improvement. The temperature was 99.2 and he slept well. The temperature was maintained on 27th November, 1932, and the heart sounds were more distinctly heard: the right border of the heart was just outside the sternal margin and the apex beat was under the 6th rib and $3\frac{1}{4}$" from mid-line. The mitral murmur was unchanged. The improvement continued until 2nd December, 1932, when he was removed by his guardian against my advice in order that he might proceed home to his parents.

442. The occurrence in a lad of 18 of an acute febrile condition associated with severe pain affecting the large joints flitting from joint to joint; the lesion of the mitral valve and the development of a pericarditis are all suggestive of acute rheumatism.

443. The response to treatment by sodium salicylate is also suggestive of this disease.

444. *Differential diagnosis.*—The possibility of gonococcal arthritis can be definitely ruled out in this case as there was no sign of present or past infection. There was no sign of suppuration in any of the joints and no effusion into the synovial capsules. The absence of any symptoms referable to the respiratory system is against the possibility of a pneumococcal arthritis. There was no sign of tuberculous disease and the clinical features and cause were against early rheumatoid arthritis.

445. Taking everything into consideration it could seem reasonably certain that the patient was suffering from an attack of acute rheumatism. It is regrettable that the subsequent history could not be followed up.

IV.—Report on Mucocele of Appendix.

By Dr. R. D. Reid, Medical Officer.

446. A man of forty was admitted to the African Hospital, Kumasi, one night suffering from a strangulated left inguinal hernia. Radical operation was performed at once and he made an uneventful recovery.

447. On the tenth day, he complained of a small direct hernia on the right side. This he considered to be due to a lump which he could feel in his right iliac fossa. On palpation, a slightly mobile tumour, about the size of a tangerine orange, could be felt in the region of the caecum. X-ray examination was made in Accra, but no definite information was gained.

448. As he was anxious to have the lump removed, laparotomy was performed and a spherical tumour, two inches in diameter occupying the middle third of the appendix and attached to the caecum was found. This was dissected free and removed by appendicectomy. Recovery was again uneventful.

449. On section, the tumour was found to be a cyst with a fibrous wall about a twelth of an inch thick. The contents were translucent mucinous material. Both proximal and distal parts of the lumen of the appendix were occluded.

450. The incipient hernia on the right side disappeared with exercise of the abdominal wall, suggesting the possibility that the patient's hypothesis of its etiology was correct.

V.—Interesting case of Extra-Uterine Gestation.

By Dr. A. M. MacRae, Specialist, Gold Coast Hospital.

451. Case A.—D. Q.—aged 27, native of Akwapim, referred from Maternity Hospital, and admitted to Gold Coast Hospital, on 5th August, 1932.

452. *History of illness* was as follows :—

> One child was born early in 1930. About one year after the birth of the first child, and while it was breast fed, the patient noticed a swelling of the abdomen which gradually got bigger. During this period from 1930 up to February, 1932, there was amenorrhœa. From February, 1932, up to August, 1932, when she first came to Accra for advice ; menstruation occurred at regular intervals, but was scanty in amount, and lasted only for one or two days. She had begun to menstruate the day previous to admission. Patient came to hospital because she wished to know if she were pregnant, and because she could not understand why she felt no " movement " in the womb.

453. *Examination.*—The patient was a healthy looking normal woman of intelligent facies. Examination showed a large irregular mass lying transversely across the abdominal umbilical area, with a sharp upper border, and with smaller irregular masses lying alongside the main tumour mass. Bimanual vaginal and rectal examination showed a mass in the pelvis corresponding to the uterus, but irregular in outline, and a larger tumour mass which was definitely extra uterine, freely moveable, and lying in the peritoneal cavity. What were thought to be limbs could be palpated. No foetal murmur or uterine was heard. X-ray showed what appeared to be the skeletal outline of a child inside the abdomen. Extra uterine gestation was diagnosed. The patient agreed to operation and a laparotomy was done on 9th August, 1932. A mid-line incision was made. On opening the peritoneal cavity a mummified foetus of five to six months was seen lying free of all attachments. Part of the cord stuck out from the umbilicus of the foetus not unlike a sausage in appearance. The placenta was separate and was anchored as a mummified mass to the anterior wall of the uterus.

454. There was a smaller mummified tumour, probably the middle segment of the mummified cord, lying free and attached to the mesentery. The left ovary was cystic and the uterus quite normal in size, shape and position. Both tubes appeared normal. The mummified foetus was removed also the smaller tumour and the placenta peeled off the uterus. Recovery was uneventful. The patient came up for re-examination in March, 1933, and looked very fit and well. Nothing abnormal in the pelvic area could be detected.

APPENDIX 3.

I.—Report on Tuberculosis treated in the Gold Coast Hospital, 1932-33.

By Dr. A. M. MacRae, Specialist.

455. The total of 143 cases of tuberculosis treated in the Gold Coast Hospital during the year under review is here briefly summarised.

456. This total includes nine cases carried on from last year. The cases are grouped as follows :—

(*a*) Pulmonary tuberculosis

(*b*) Tuberculosis of bones and joints

(*c*) Tuberculosis of peritoneum and intestines

(*d*) Tuberculosis of lymphatic glands.

457. *Group A.—Pulmonary tuberculosis*—One hundred and fourteen cases are shown under this heading. Of these 79 showed a large amount of tubercle bacillus in the sputum on first examination.

Both lungs involved in	45.5 per cent.
Right lung ,, ,,	29.1 per cent.
Left lung ,, ,,	25.4 per cent.
Larynx ,,	1 case in addition to lung involvement.
Deaths in this group were	49 or 43 per cent.
No change shown in	35 cases.
Improvement shown in	25 cases.
Great improvement in	4 cases.
Apparent cure	1 case.

458. All cases discharged left at their own request or at the wish of their relatives. The greater number of this group was definitely infective. The average stay in hospital of 50 patients taken at random was 34.6 days. Treatment in all cases was almost entirely symptomatic. Very few of these cases were suitable for collapse therapy which, as has been stated in a previous report, has so far been disappointing in its results.

459. *Group B—Bones and joints.*—In this group, 15 cases were under treatment. Five cases were typical cases of T.B. of the dorsal vertebræ with compression signs and symptoms, and the remainder, T.B. of tarsal bones (6), hip joint (2) and ribs (1). The average stay in hospital of the vetebral cases was 75 days, and the group result showed improvement in two cases and no change in three.

460. The second group showed an average stay of 53 days, and a group result of improvement in three cases and no change in six cases. Treatment in this group was chiefly by immobilization of the part affected and improvement of the general health by general medicinal measures and feeding.

461. *Group C.*—Tuberculosis of the intestine and peritoneum accounted for seven cases, with an average stay in hospital of 25 days. The group result here was four discharged improved, and the remainder discharged with no change in their condition.

462. *Grqup D.*—Although numerous cases of enlarged cervical glands were seen and operated on, only one was diagnosed definitely as tuberculosis.

463. The general impression from this series of cases is that the type of infection is undoubtedly human in almost all. The type of patient who comes to hospital with T.B. is invariably a highly infective patient with the disease far advanced, but there must be large numbers whom we do not see. The high rate of infective sputum shown in the pulmonary series demonstrates the dangers following overcrowding and indiscriminate expectoration in public places.

II.—A Note on the Incidence of Tuberculous Infection among the General African Community.

By Dr. W. N. Greer, Medical Officer.

464. In an article on tuberculosis among American negroes, Opie* states that the tuberculin reaction has shown that minor infections with the tubercle bacillus occur with increasing frequency from birth to adult life, and that these infections confer a certain degree of immunity.

465. As the West African native is commonly said to have little or no immunity to this disease, I thought it would be of interest to see to what extent the healthy African population of the Gold Coast showed evidence of infection with the tubercle bacillus.

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*Opie, E. L. "The Epidemiology of Tuberculosis of Negroes" Tubercle 1931 XII 207.

466. As a result of work carried out in London, Dow and Lloyd† came to the conclusion that the intra-cutaneous tuberculin test of Mantour was the most reliable for determining the presence of tuberculous infection.

467. During the past year, where opportunity offered a series of tests by this method was carried out in Saltpond. In all, just over 1,000 persons were tested. These were healthy subjects whose ages varied from 4–70 years and they represented practically all classes of the community.

468. The initial dose was 0.1 c.c. of either 1–5000 or 1–1000 dilution of old tuberculin.

469. If no reaction was obtained the dose was increased till 0.1 c.c. of 1–100 dilution was reached.

The results are tabulated below.

Age Years.	Males.			Females.			Total.		
	Number tested.	Number positive.	Per cent positive.	Number tested.	Number positive.	Per cent positive.	Number tested.	Number positive.	Per cent positive.
0–5	44	9	20.4	40	7	17.5	84	16	19
6–10	158	40	25.3	75	24	32.0	233	64	27.5
11–15	165	81	49.0	53	19	35.8	218	100	45.8
16–20	100	72	72.0	24	14	58.3	124	86	69.3
21–30	107	78	72.8	68	43	63.2	175	121	69.2
31–40	41	36	87.8	52	36	69.2	93	72	77.4
41–50	17	14	82.3	34	22	64.4	51	36	70.5
51–and over.	3	3	100.0	20	16	80.0	23	19	82.6

470. From this table it will be seen that in the series of cases investigated, tuberculous infection increased steadily from childhood to adult life, in both sexes. 71.6 per cent of persons over 15 years of age were found to be infected.

471. Tuberculisation of the community appears to be fairly widespread.

APPENDIX 4.

Report on the Maternity Hospital, Accra.

By Miss M. K. Lawlor, Woman Medical Officer-in-Charge.

472. *The Staff.*—The staff consisted of :—

1 Woman Medical Officer
2 Nursing Sisters
6 Midwives-in-Training
7 Nurses-in-Training and
3 Unpaid pupil Midwives.

Two of the staff passed the Midwives Board Examination and qualified as Midwives.

473. *Buildings.*—The two open verandahs surrounding the large open ward upstairs, which formerly accommodated four beds each, have been made weather-proof and converted into rooms which can each take three beds. This has added materially to the comfort of the patients. Plans for an isolation block for infectious cases have been passed and it is hoped that this much desired addition will be completed during next year. It will now be possible to keep all septic cases away from the main building.

†Dow Dorothy J. and Lloyd W. Ernest "The Incidence of Tuberculous Infection and its Relation to Contagion in children under 15" *British Medical Journal* 1931 No. 3682, 183.

474. *Patients.*—The past year showed another large increase in the number of in-patients and out-patients. In the first month of the year the admissions reached 100 and nine months later the number reached 140.

475. The following table allows of a comparison of the present year figures with those of former years :—

	1930–31.	1931–32.	1932–33.	Increase.
Attendances at Ante-natal and Postnatal clinics ...	9,968	12,722	14,394	1,672
In-patients—admissions	678	972	1,393	421
Deliveries	452	553	772	219

476. *Research.*—Owing to the increase of work and changes in the staff there was no opportunity to undertake research work, but routine Wassermann reactions and examinations of peripheral bloods for malarial parasites was carried out on all patients by the Medical Research Institute.

477. The following tables give the results of these examinations :—

Wassermann reaction :

Total number examined	1,241
Number with double plus reaction	275
Number with single plus reaction	124
Number with plus over minus reaction	13

The positive reaction rate for in-patients was therefore 33.2 per cent.

Malaria :

Total number of cases examined	1,341
Number showing malarial parasites	387
Number negative to malaria	954

478. *Toxaemias of pregnancy:*

(*a*) *Albuminuria.*—Thirty cases of albuminuria of pregnancy with and without raised blood pressure have been seen. These cases do not include 23 cases of schistosome infection which had albuminuria with raised blood pressure.

(*b*) *Eclampsia.*—Five cases occurred among the hospital patients and all recovered. One was a case of post-partum eclampsia in a patient who had been in hospital one week before delivery and in whom albuminuria had not been discovered until the morning on which the patient delivered. The case was a mild one.

(*c*) *Toxic vomiting.*—There were five cases of vomiting sufficiently severe to justify the diagnosis of toxic vomiting. One died two days after admission.

(*d*) *Anaemia.*—There were eight cases of anaemia in which the red cell count was in the neighbourhood of 1,000,000 and the hæmoglobin was less than 20 per cent. All recovered under treatment with raw liver and marmite and none experienced serious post-partum haemorrhage at parturition.

479. *Analysis of cases.*

In-patients admissions	1,393
Admitted for ante-natal treatment	497
Labour cases	772
Abortions	52
Post-natal, complications	46
Infants	41
Other cases	41
Total deliveries	772
Living infants	698

Presentations.—802 including 32 pairs of twins.

Vertex	19
V.LOA	416
V.ROA	286
V.LOP	6
V.ROP	10
POP	17
RSA	4
LSA	18
RDA	1
Face	2
Breech	22
B.B.A.	2
Brow	1

Analysis of Maternal deaths. Total 29.

Post-partum haemorrhage	2
Obstructed labour	6
Puerperal fever	4
Peritonitis	2
Acute toxaemia	1
Anaemia of pregnancy	3
Bacillary dysentery	2
Post-operative collapse	1
Gastro-enteritis and toxaemia	1
Rupture uterus	5
Typhoid	1
Delayed chloroform poisoning	1

Analysis of Infants deaths. Total 55.

Broncho-pheumonia	2
Prematurity	27
Congenital debility	11
Dystocia with intracranial injury	8
Haemorrhage of new born	3
Meningitis, influenza	1
Septicaemia	1
Congenital syphilis	1
Convulsions	1

Analysis of Stillbirths. Total 84.

Dystocia	37
Ante-partum haemorrhage	4
Obstructed labour	17
Anencephaly	1
Cerebral haemorrhage	4
Hydramnios	1
Congenital debility	3
Prolapsed cord	3
Congenital syphilis	2
Hydrocephalus	1
Unknown cause	11

480. *Morbidity.*—There were 130 morbid puerperal cases according to the B.M.A. standard. This figure, in porportion to the number of patients is very nearly the same as that of last year. Sepraemia accounted for 81 of these cases and was due to the general debility of the pregnant and puerperal patients and to native methods of aiding prolonged labours. Natural local resistance to sepsis is definitely high as is shown by the fact that only in four cases was a septicaemia found on blood culture. From the blood cultures, the bacillus coli was obtained from three and an anaerobic streptococcus from the other one The last mentioned

case occurred in a woman with placenta praevia who had been treated outside hospital before admission for ante-partum haemorrhage. The case was typical of a puerperal septicaemia due to the anaerobic streptococcus and proved fatal in three weeks.

Analysis of Morbidity :

Sapraemia	81
Septicaemia	4
Pelvic cellulitis	3
Pelvic peritonitis	2
Caesarean section	5
Eclampsia	2
Salpingitis	1
Breast affections	5
Malaria	16
Pyelitis	1
Bacillary dysentery	9
Cystitis	2
Pneumonia	1
Pulmonary tuberculosis	2
Chicken pox	1

Operations :

Caesarean section	8
Forceps	86
Craniotomy	7
Decapitation	1
Internal version	10
Breech with extended legs	3
Breech with extended arms	2
Manual removal of retained placenta	12
Impacted shoulders	1
Dilatation and curettage	33
Laparotomy	5
Sub-total hysterectomy	2
Surgical induction of labour	33
Circumcision	14
Prolapsed cord	1
Perforation for hydrocephalus	1
Vesico-vaginal repair	1
Salpingo-oophorectomy	1
Other operations	12

APPENDIX 5.

Annual Report on the Leper Settlement, Ho.

By Dr. G. F. T. Saunders, Medical Officer.

481. *Staff.*—The following constituted the staff of the Settlement —

(*a*) One Medical Officer.
(*b*) One African Superintendent.
(*c*) One Head Dresser (a trained leper).
(*d*) Three Assistant Dressers (trained lepers).

482. *Buildings.*—No new buildings were erected during the period under review, but the inmates themselves undertook a certain amount of repair work and thus maintained the buildings in good condition.

483. *Work done.*—The total cases treated amounted to 329 and in a good proportion of cases marked improvement was noted. The inmates are chiefly from the Trans-Volta area.

484. *Employment.*—Farming, weaving, carpentry, shoe-making, basket-making, wood-carving and pottery are the chief occupations of the inmates.

485. *Education.*—Adults and children, both male and female, attend schools which have been erected within the Settlement by the Ewe Presbyterian and the Roman Catholic Missions. During the year the Ewe Presbyterian Mission improved its church and school.

486. *Sanitation.*—The sanitary condition of the settlement was satisfactory. Three scavengers are employed and a helping hand is periodically given by the inmates.

The three incinerators which were built last year worked well and did very useful work.

Latrines are of the flyproof pit type.

487. *Water Supply.*—It is unfortunate that the water supply is scanty and of indifferent quality, but it is hoped that one day there will be sufficient funds to extend the Ho pipe line to the settlement.

488. *Statistics.*

Treated during the year	329
Remaining on 31st March, 1932	313
On maintenance allowance	329
Admitted during the year	53
Discharged, or left on parole	25
Died	2
Remaining on 31st March, 1933	289
Ran away	24
Leave of absence	42

489. *Donations.*—Gifts of school materials and clothing and a gramaphone and records presented by the Gold Coast Branch of the British Red Cross Society gave great satisfaction to the inmates.

APPENDIX 6.

A Note on Yellow Fever Control in the Gold Coast and the present situation.

(*A paper read at the League of Nations Regional Health Conference held at Capetown in November*, 1932.)

A.—PRELIMINARY.

490. In this note I will summarise as briefly as possible my experience of yellow fever control on the Gold Coast, stating what the main lines of our practice are and what we have already achieved. Much of what follows must already be known to delegates, but some may care to hear such a résumé as this.

491. The discovery in 1900 that the stegomyia mosquito (now known as the ædes argentenus or aegypti) was the ordinary carrier of yellow fever led at once to a certain amount of control, but really serious efforts were not made until 1910. I myself saw the beginning of this work and have followed it carefully up to date. In the first week of May, 1910, an outbreak began in Freetown, Sierra Leone, and between then and the first week in August a series of severe cases occurred, with a heavy mortality rate. Ten adult cases in all were noted (five Syrians, four Europeans and one African), all of whom died except one European. There was only one female in this series—a Syrian.

492. In April of the same year an outbreak began on the Gold Coast at Sekondi, with a similar heavy mortality rate—ten European and two African cases, with 11 deaths. The only recovery was a European female—the one female of the group. At Axim, a small timber port to the west of Sekondi and at Saw-Mills Camp, 12½ miles inland on the Sekondi-Kumasi Railway, independent so-called "sporadic" cases occurred. I shall refer later to the use of the word "sporadic" in connection with yellow fever.

493. These outbreaks caused considerable alarm at the time and Sir Rubert Boyce, at the request of the Colonial Office, proceeded to West Africa to investigate the subject on the spot. He sailed from England on the 1st June, 1910, and was accompanied by several young medical officers who had recently been appointed to the West African Medical Staff. Two disembarked for duty at Freetown and six others (of whom I was one) went on with Boyce to Sekondi, to assist him in any work which he proposed to do. We landed about the middle of June, and found that the outbreak had been brought to a speedy end by the energetic action of Dr. Rice—then head of the Sanitary Branch of the Gold Coast Medical Department. Our work was to re-fumigate infected and other bungalows, and to press on with the general anti-mosquito measures, which had all been intensified. We all worked very hard and were familiarly known at the time as the " Yellow Perils."

494. In December of the same year Boyce, who had completed his investigations, published his work " Yellow Fever and its Prevention." His object was to furnish a text-book on yellow fever for the use of medical officers working in West Africa. In this book he summarised his own experiences and observations in New Orleans and Central America in 1905, in the West Indies in 1909, and in British West Africa in 1910. He laid special stress on the subject of yellow fever as it appeared in West Africa and on the need for vigorous and continued action. Simple and clear directions for control, based on the fundamental work of the American Commission of 1900–01, were enunciated and a mass of most valuable information collected. I know of no single publication on the subject so helpful to a medical officer or medical officer of health working even to-day in West Africa.

495. One statement by Boyce in his book provoked a considerable amount of controversy at the time, viz., " The African native is as saturated with yellow fever as he is with malaria, and his escape from severe yellow fever and its very frequent occurrence amongst the whites is proof of the contention " (page 259).

496. It was not—as we now know—entirely just to compare yellow fever with malaria, or to use such a word as " saturated." The diseases cannot well be compared. Boyce's object, however, was to emphasise his own opinion that a considerable amount of mild yellow fever was going on unrecognised amongst natives (especially children), and that really effective control measures should be pressed forward. He held that much of what was then called " remittent " and " bilious remittent " fever, and attributed to the malarial parasite, was in reality true yellow fever and would disappear with the destruction of the stegomyia.

497. Another object he had definitely in view was to encourage early diagnosis and notification of the disease by medical men, and to break down what he called " notification fear." He insisted in and out of season on the public danger of any " ostrich " or " hush-hush " policy in dealing with yellow fever. When I assumed duty on the Gold Coast there was a reluctance on the part of the administrative authorities to admit the presence of the disease in a centre, owing to the panic liable to arise, and to the interference with trade and commercial interests which would follow on the quarantine measures which then used to be taken. He urged that the joint effect of failure on the part of individual medical men to be on the alert for and to report every case, or even suspected case, and of failure on the part of the administration to admit freely the possible presence of the disease and to encourage such reports, was against the best interests of the public health and might easily be disastrous. Boyce's efforts have been most fruitful and a " hush-hush " policy has long ago been abandoned on the Gold Coast as indefensible.

B.—ACTUAL CONTROL MEASURES.

498. I now come to the measures ordinarily employed for control. For practical purposes these may be divided into :—

(1) Routine measures in constant use :—

(*a*) Mosquito destruction in the ports and all the larger towns, and beyond these areas where we can place reliable sanitary staff.

(*b*) Segregation of susceptibles (Europeans) in residential areas with a building-free zone of at least 440 yards from the native town and the enforcement of very special rules for these areas.

(*c*) A constant watch by all medical officers for cases of the disease, mild or otherwise, and the collection and dissemination to all stations of information concerning such cases.

(ii) Emergency measures during an outbreak :—

(*a*) Intensification—especially at a focus of outbreak—of the routine anti-mosquito campaign. It is assumed, as a working rule, that when a recognisable case occurs, an outbreak is going on somewhere in a mild unrecognisable form, and that a genuinely " sporadic " case cannot really occur.

(*b*) Proclamation by law of " infected areas " in order to obtain emergency powers for the sanitary authority.

(*c*) Temporary evacuation, if necessary, of susceptibles from such areas.

(*d*) Isolation and careful screening of cases, and fumigation of houses where such cases have occurred.

499. By far and away the most important of all these measures is the destruction of mosquitoes by anti-larval measures. Constant war against the stegomyia must and does go on. The major portion of our effort is directed to keeping the " house " index for larvae as low as possible. Fortunately, the habits of the stegomyia are well known and, provided the necessary efforts are kept up, breeding can be comparatively easily controlled. Any remissness of effort in this respect is regarded as a sanitary sin. The stegomyia is regarded essentially the domestic mosquito, breeding almost entirely in artificial containers of uncovered standing water in and around houses, and living in close association with man. It is quite possible, therefore, in every important civilised centre with a sanitary staff to apply larval control in conjunction with other general public health measures.

Application of Methods.

500. (i) *Piped water supplies in the chief centres.*—The introduction of a piped water supply has been found to be the most effective single measure which can be applied to a town to limit breeding. The need for storing water in tanks, barrels or cisterns which require careful screening and constant attention, or for hoarding it in water-pots, jars, etc., in the corners of a dwelling, ceases at once. Roof-gutters leading to storage-tanks tend to sag and to hold water, and need to be carefully graded and perforated. When a piped supply is installed, these can be removed. Filthy surface-wells can be filled in, etc., etc. Our important ports have now piped supplies and in a short time our larger inland centres will have the same.

(ii) *Important centres without piped supplies.*—In these the ordinary methods of screening stored water, etc., are still carried on. Much of the time of our sanitary staff in such places is devoted to the supervision of water-supplies. Tanks, barrels, cisterns, etc., must be screened and attended to, roof-gutters graded and perforated, etc., etc. The task is a heavy one, but it is in places such as these and in the larger villages that the disease is most likely to persist.

501. Financial resources do not permit the employment of a large enough staff to achieve in the outlying villages the same high standard of control which is possible in the larger centres, but at the same time every effort is being made to bring home to the people the desirability of keeping down the number of stegomyias—and not without a measure of success. Progress, to be lasting, depends ultimately on the advance of education and enlightenment, and this is bound to be a slow process.

(iii) *In all important places.*—In addition to the above primary measures, certain accessory measures are employed. Apart from the large water-containers for the normal supply of the dwelling, regular attention must be given to all water-holding receptacles which might possibly constitute breeding places (flower vases, anti-guards, etc.). All tins, bottles, calabashes, coco-nut shells, old crockery, etc., must be regularly removed by the householder to the dustbin, from which they are removed by the sanitary squads for ultimate disposal by burial or destruction. Rot-holes in trees, hollows in rocks, and various unusual breeding-places must be sought out and dealt with. At times, as need arises, other methods such as the kerosening of defective drains or of collections which cannot be covered, drainage or filling-in of certain collections of water, stocking with fish, etc., may be employed. Of accessory methods, the removal of rank grass, weeds, shrubs, etc., and the general clearance of bush for a wide area around habitations and villages has proved a measure of the greatest importance and value. The results of putting an end to the indiscriminate throwing-out of old tins, bottles, etc., or other rubbish—which may remain concealed and form breeding centres—are most beneficial.

(iv) *Staff.*—An active staff of trained inspectors, backed up by clear laws which can be firmly enforced against all classes, is essential. This exists at al the large centres. All opposition to the activities of the staff must be fought strenuously.

(v) *Segregation.*—When I assumed duty on the Gold Coast in 1910, the majority of Europeans belonging to the mercantile community lived over their business premises, which were situated in the heart of the native towns. As a result they suffered far more severely than officials from yellow fever and other illnesses. In 1908 Government took steps to encourage merchants and non-officials to live outside of the native towns, by offering land on easy terms for the erection of bungalows on approved plans. At first few firms took advantage of this offer, but by now they have learned the wisdom of segregation—so much so that there is now little difference in the invaliding and mortality rates between officials and non-officials. This excellent result is, no doubt, due in part also to the other routine measures in force.

Syrians, however, still prefer to live in the native towns. As a result, they still suffer considerably from various illnesses. They are often the first to be attacked if yellow fever breaks out, and thus furnish an indication of the presence of the disease.

(vi) *Notification : Early Diagnosis, etc.*—I have already referred to the fact that at the beginning of an outbreak well-marked cases are rare, whilst milder types predominate. Another fact is that the disease displays a peculiar tendency to break out simultaneously, and apparently independently, in different places. These facts are of the highest importance from the point of view of control.

502. I have touched on the former reluctance to admit, or even in some instances the conspiracy to deny, the presence of the disease when reported. On the Gold Coast this evil phase has completely passed. Every medical officer is encouraged to study closely the clinical manifestations of the disease, and to have constantly in mind the possibility of its occurrence especially if stegomyias are at all numerous in his area. He is encouraged to notify, without hesitation, every suspicious case. The clinical diagnosis of mild cases is extremely difficult, and a medical officer is not criticised adversely should he diagnose as yellow fever a case which subsequently proves to be something else. Quite the reverse. It is felt that he has acted on the "SAFETY FIRST" motto, and in the very best interests of the public. The result of a notification is that a senior officer proceeds with speed to the spot in order to assist the junior officer in the case. Every step necessary is taken to verify diagnosis. Blood is collected and sent on ice to Lagos, to the Rockefeller Foundation Laboratory. If death occurs, post-mortem specimens of liver, kidney, etc., are collected for sectioning. If a suspected case turns out to be positive, telegrams are despatched from the central office to all stations. Anti-mosquito measures are then intensified everywhere, in order that chance of spread may be limited. Other administrations in West Africa are at once notified by cable. The really important point to note is that there is now no concealment whatever. In the old days the French used to blame the British especially for their reluctance to admit the presence of yellow fever in their territories.

503. Connected with this open policy is the gradual recognition by intelligent Africans that it is in the interest of themselves to support the administration in its efforts. Formerly there was a disposition to believe that the measures directed to the destruction of mosquitoes were intended for the benefit of Europeans only, but on the Gold Coast it is gradually coming to be recognised by Africans that although Europeans do suffer from the disease more severely than Africans, nevertheless, Africans can suffer and die from it, and that in their own interests an attitude of apathy or opposition, active or passive, is not justified. We have, of course, those who are inclined to be suspicious of everything Government does, and to raise political or colour questions if they can, but in my opinion such individuals are becoming fewer every day. The African has now great confidence in, and respect for, European medicine and medical men, and the progress we have made, as evidenced by a steadily lessened opposition to anti-larval measures, is due in a large measure to this confidence and respect.

C.—ACHIEVEMENT.

504. With the staff at our disposal and with our present financial resources, it is not possible to sanitate fully or to "mosquito control" every village on the Gold Coast. Such an aim would be quite impracticable, but it is possible to achieve, and we do actually achieve, a considerable measure of control in all the large centres, and especially in the seaports.

505. The monthly "larval index" is taken as our practical working measure of control. By this I mean what O'Connor calls the "house index" namely the ratio of houses or compounds found infested with larvae (i.e. found on routine inspections to have one or more water receptacles with mosquito larvae) to all the houses inspected. Each town under control is divided into wards for the purpose. All larvae found in fresh water containers in or near a house are, for practical purposes, regarded as stegomyias, but at regular intervals a certain number of specimens are set aside to breed out. Monthly returns, controlled by a check made by European inspection, are prepared and forwarded to head-quarters. Boyce held that in towns where the index was 100 per cent, yellow fever could be assumed to be endemic; where it was 10 per cent or below, it could be assumed to be not endemic; below 5 per cent a few so-called "sporadic" cases might occur, but no serious spread. Our efforts are directed to keeping the index well below 5 per cent. 1 per cent or 2 per cent is not uncommonly returned, but any approach to 5 per cent or over is, in practice, taken as a signal for enquiry and action. Where enquiry is required, it almost always proves in practice that inspection has been slackening.

506. A very striking fact is that in no centre in which segregation combined with mosquito control has been practised, has yellow fever broken out in the area of segregation. This, to my mind, is conclusive proof of the possibility of strict control of yellow fever in any area desired. True, an outbreak did take place in Tamale in 1931, but residential areas in that town with building-free zones had not been correctly delimited then, an unsafe number of native dwellings had been permitted to remain in close proximity to European dwellings, a pipe-borne water supply had not been installed, and the general sanitary position was not satisfactory. Steps have since been taken to remedy all these points, and further serious trouble is unlikely. I should mention that from all controlled residential areas African children are rigorously excluded at all times, and only those natives who are personal servants of the occupier of a house are allowed to sleep in the area.

507. I think that little more can be done than we are now doing on lines of mosquito control. It is recognised that the price of immunity from attack by yellow fever is an unceasing war on the stegomyia mosquito. We have to contend with careless and obstructive householders, careless or lazy or deceitful inspectors—and even when the greatest care is taken it is possible to overlook and miss small collections of water which may be breeding mosquitoes freely.

508. I do not look forward to the complete elimination of yellow fever from the Gold Coast. The masses in the outlying villages are still too ignorant and careless; the area to be dealt with is too large to be effectively covered by our supervising staff, but we can keep the strategic centres clean, and we can keep the segregation areas for Europeans very clean. Conditions to-day are vastly better everywhere than they were in 1910, when I first came to West Africa, and as time goes on further progress should certainly be possible.

D.—THE NEW KNOWLEDGE.

509. It will be seen from the above that I have made no reference to the recent work of the Rockefeller Foundation and the great advances in knowledge which have been made, but have limited my remarks to well-tried and well understood control methods. Although great things are expected from Dr. Sawyer's protective vaccination and the new weapon is bound to be of tremendous value, we must, I think, still continue the war against the insect vector as vigorously as ever—and this not alone as a special anti-yellow fever measure, but as part of the general war against all forms of filth and vermin. I have no doubt that those countries of Africa in which yellow fever is non-endemic will applaud such endeavours. In taking the step we do, we admit that we are acting primarily in our own interest, but we recognise at the same time a duty to our neighbours. Hitherto we had considered only our immediate neighbours on the West Coast, but

we must now think of those further afield. But is it fair to expect that the whole burden of effort should be borne by the countries in which yellow fever is endemic ? I have no personal knowledge of East African conditions—I hope to pay a flying visit to Kenya and Uganda after this Conference. The opening-up of land routes suitable for motor travel throughout tropical Africa, is bound to facilitate the spread of infectious disease. The African is everywhere a great traveller. It will not be easy to control all his comings and goings. Why yellow fever has not already reached East Africa would seem to need complete explanation.

E.—AIR TRANSPORT.

510. From this note I hope I have made it clear that it is, in my opinion, quite possible so to control specialised areas in West Africa that yellow fever may be completely eliminated from them. Such areas already exist in our official residential areas. There is no difficulty in so siting an aerodrome, and in controlling sanitary conditions in and around it, that the chances of taking on board an infected mosquito are almost nil. The de-insectisation of an aeroplane before departure is also a simple measure.

511. The chance of a human being who may be incubating yellow fever being taken on board is a much more likely possibility, but as Dr. Johnson* has suggested, air services from West Africa are for some time likely to be limited and to be used almost exclusively by Europeans. On the despatching side it would be quite feasible to secure that passengers and crew should dwell in a residential or other well-controlled area for six days before departure, and to issue medical certificates to this effect. Immunisation of crews and passengers (Sawyer's method which may be improved as time goes on), with certification, would appear to be a possible routine measure before very long, and the receiving country could insist on this measure. Action on such lines by a despatching country could reduce the risk of yellow fever being carried by aircraft to zero. I have already ventured the opinion that the risk of the introduction of the disease to East Africa by land is probably greater than it is by air.

512. The administrations there should, I think, for this reason alone, turn their attention very closely to their position with regard to stegomyia control, and how they are prepared to meet the threat of an advance of the disease by land as well as by air.

D. DUFF.

CAPETOWN,
November, 1932.

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*B.M.J., 13th August, 1932, p. 285 : " Recent Advances in the knowledge of Yellow Fever."

APPENDIX 7.

(THE PAPER BELOW WAS HANDED IN TO THE RURAL HYGIENE COMMITTEE OF THE LEAGUE OF NATIONS REGIONAL HEALTH CONFERENCE HELD AT CAPETOWN IN NOVEMBER, 1932.)

A brief note on the present position on the Gold Coast of the Problem of Training African Medical Assistants for work in rural Dispensaries.

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513. For a long time Government has recognised that an urgent need existed for supplementing the work done by its fully qualified medical staff, and that sooner or later some method must be found for extending more widely amongst the people the benefits of modern scientific medicine. In this note I propose to indicate briefly how far we have gone on the Gold Coast in our efforts towards solving our own problem.

514. In 1921 the population of the Gold Coast, Ashanti, the Northern Territories and British Mandated Togoland was 2,296,400. According to the census taken in April of 1931 this had increased to 3,160,386 or by nearly 38 per cent. The area occupied is 91,843 square miles giving a density of 34.41 per square mile. This growth has been very remarkable and encouraging, and although much of the increase has been caused by immigration in prosperous years from less naturally wealthy neighbouring French Territory, quite a large proportion must also have been due to natural increase fostered and conserved by the efforts of our Medical and Health Service. Of the total population in 1931 some 2,532 only were Europeans. During the last year or so of depression there has been a certain return flow to French Territory of Africans and the European population has dropped by about 30 per cent.

515. To deal with the needs of the three million odd people, 1929–30 a staff of 59 qualified clinicians which included two women Medical Officers and five African Medical Officers was actively engaged in the work of hospitals, dispensaries and infant clinics. This meant one Government doctor to every 53,000 of the population. Private practitioners are not numerous. Staff has recently been considerably retrenched.

516. It may be of interest to give some idea of the work done by these officers in the year mentioned. Approximately, 16,000 in-patients and 233,000 out-patients were treated. In other words each medical officer dealt with an average of about 270 in-patients and 4,000 out-patients during the year. A very considerable increase in these figures during 1930–31 took place, and the strain on the staff which, owing to financial stringency, had been much curtailed became very severe. In 1931–32 the strain continued.

517. To all who are familiar with tropical African conditions, it must be obvious that to obtain European medical officers in sufficient numbers to deal at all adequately with the needs of the whole populace is quite impossible, and that the solution of the problem must therefore be sought in the training of African Natives locally. Facilities on the Gold Coast for general education up to the required standard were unfortunately for many years lacking, or at least very limited, but in the year 1927 it was considered that the advance in secondary education warranted a more thorough investigation of the possibility of establishing a School of Medicine. In December 1925 the third conference of the senior members of the West African Medical Staff had already drawn up in outline a scheme for training medical assistants.

518. The Secretary of State for the Colonies therefore appointed a committee consisting of the Directors of the Medical Departments of the various British West African Colonies, the Principal of the College of Medicine recently founded at Singapore for the Malay States, and the Principal of the Prince of Wales College, Achimota, Accra, Gold Coast, to advise him when it would be likely that there would be a sufficient number of suitably educated Africans to justify the establishment of a Medical School capable of producing *fully* qualified medical practitioners. The committee was instructed to draft a scheme for such a school and to advise on the standard of education required for entrants. In

addition the question of training a grade of assistants who, whilst not fully qualified in medicine and not to be regarded as fully responsible or permitted to do private practice, were yet to be sufficiently trained to deal with simple cases of prevalent ailments (ulcers, yaws, etc.), and to give what I may call first-aid treatment in the villages, was to be considered by the Committee.

519. The report of this committee was presented early in 1928. Its recommendations were considered by the various administrations and finally by the Secretary of State, and it was decided that it was premature at that stage to proceed to the foundation of a school of medicine for producing fully qualified doctors. Meanwhile, the various colonies were instructed to proceed to the advising of schemes for turning out medical assistants.

520. My predecessor, Dr. Inness, following closely the recommendations of the committee, drew up a scheme which would provide the colony with a staff of 250 assistants, or about one for every 12,000 of the population. Thirty students were to be admitted annually till 90 were being trained at one time, and the full course of training was to be four years.

The cost of this scheme was :—

Capital expenditure on school buildings spread over three years estimated at £73,000.

Recurrent costs for 90 students at £6,000 p.a. and for 250 fully trained assistants at £95,000 odd per annum excluding the cost of drugs and dressings for the dispensaries.

521. These proposals were considered too costly and a simplified scheme for 120 assistants was then prepared. The cost of this was—

Capital cost ... ... £64,000 odd.

Recurrent cost from £2,600 odd in the first year to £30,000 odd in the twelfth and following years,

but even this scheme was found, in the increasing financial depression to be too costly.

522. It should be noted that the medical assistants to be trained under these two schemes would constitute a new grade intermediate between our nurses and dispensers on the one hand and our medical officers on the other.

523. Doubts were felt at the time as to the wisdom of the step of creating this grade, some believing that it would be wiser to wait till it was possible to train fully qualified doctors locally, some urging that the need for assistants was so pressing that the advantage of creating them quite outweighed all disadvantages. Many important questions were involved in the decision. What exactly were to be the functions, duties and responsibilities of the new grade of officers ? What training was therefore to be giving to them ? What exactly was to be their status, and their relation to other parts of the medical organisation, and how was it to be regulated ? And so on.

524. Eventually, it was decided that it was not necessary at that stage to proceed to the creation and training of a new grade, but that it would be sufficient to amplify in certain respects the training already being given to our present grade of dispensers, so as to qualify them not only for their ordinary duties, but also to be able to take charge under the regular supervision and guidance of a visiting medical officer, of outlying rural dispensaries. They were to be trained to bandage and dress, to nurse, to deal with wounds, ulcers and sores of various kinds, to treat straightforward cases of yaws, malaria, etc., to afford first-aid, to give douches and injections and to dispense well-known stock remedies for prevalent and easily recognised ailments.

525. Finally a third scheme was drawn up and approved by the Secretary of State as recently as July, 1930. It came into force at the beginning of 1931. The scheme applies to males only and its essence is to combine the training of a nurse with that of a dispenser, and, utilising this as a basis to superimpose thereon some of the fundamentals of medicine and surgery, all teaching being given as far as possible in a really practical manner in the wards and out-patient and dispensing departments of the Gold Coast Hospital at Accra. We are very fortunate on the Gold Coast in having this Hospital—a magnificent and up-to-date institution in which the necessary practical instruction can be given.

526. This hospital was opened several years ago and placed in charge of Dr. A. J. R. O'Brien, then Surgical Specialist. Under his vigorous administration it became the recognised training school for nurses and dispensers for the whole Colony. A very high standard of work was set and achieved, and a steady stream of capable nurses and dispensers, whose assistance to medical officers working in distant out-stations has been invaluable, has been turned out each year. By re-arranging syllabuses and time-tables and enlarging the lecturing room, it was found that the extra instruction required under the new scheme could be given.

527. The course is a four years one, the first two being devoted in the main to nursing duties, the last two chiefly to dispensing and elementary medicine and surgery.

528. At the moment, we have a staff of about 50 fully trained dispensers serving in the various existing centres. The full scheme provided for an addition to this staff of 80 of these new " Nurse-Dispensers." At the time this scheme was approved our dispensing school could deal at one time with about 33 pupils doing a three years course. Since then arrangements have been made to increase accommodation so that 10 new pupils could be taken on each year until an extra 40 will be in training and 10 fully trained men turned out each year, the first few being ready in the latter half of 1934 or early in 1935, until it was hoped that the full extra staff of 80 " Nurse-Dispensers " will be added to the service. The recurring annual cost was estimated to run from £1,700 in the first year to £18,000 odd in the 10th and £24,000 odd in the 15th year. The capital cost of rural dispensary buildings was estimated to amount to £57,000 odd spread over eight years ; but it is anticipated that the major portion of the cost will be borne by the chiefs and people themselves in the various areas to be benefitted. Further when and as financial prosperity returned it was hoped that by putting the dispensaries on a self-supporting basis it would be possible to provide for more than 80 extra dispensers for work in the outlying villages. The continuing financial depression has seriously endangered the whole scheme but although curtailed it has fortunately been saved and is still being proceeded with.

529. In the above outline I have not dealt with the training of midwives or sanitary inspectors. A separate scheme for the training at the Maternity Hospital, Accra, of girls to become midwives exists. Most satisfactory progress has already been made in this line, our chief obstacle to more rapid advance being the scarcity of well educated girls willing to come forward for training, but even this is gradually being overcome as education advances. The Health (formerly called the Sanitary) Branch has a satisfactory system for training sanitary inspectors. These however are employed for the most part in the larger centres.

530. In our scheme for turning out these " Nurse-Dispensers " for the double purpose of staffing rural dispensaries and performing the ordinary duties of nursing and dispensing in stations, I think that we are proceeding on safe lines. When they are posted they will later on be given sanitary supervisory duties to perform as well. A similar type of officer has proved fairly successful in the rural areas of Sierra Leone for village dispensary and other work. If I recollect aright the present Governor-General of French West Africa in his address to the Legislative Council in Dakar in December, 1930, referred to the fact that experience had shown that the training being given at the Dakar School for African assistants was too theoretical and that it would be necessary to make it more practical. It may be that the aim of the school was somewhat too high. It would be most instructive to have an account of results already achieved.

531. The problem of the training, duties and status of medical assistants for Africa is a difficult one and the greatest credit must be given to the French for their early attempt to fill the need by the foundation in 1918 of their medical school at Dakar.

532. In British West Africa each Colony has a separate administration and is engaged in solving its own problems for itself on its own lines. A scheme has recently been devised for Nigeria by Dr. W. B. Johnson, Director of Medical and Sanitary Service, of which I have no first-hand knowledge, but we on the Gold Coast are very interested in all that is being done on such lines in every other

Colony. Dr. Johnson appears to have been favourably impressed by medical organisation in the Belgian Congo and to have adopted certain ideas from there for the Nigerian scheme. The Nigerian scheme is being financed by the Native Administration and excellent progress appears to have been made (Nigerian Annual Medical Report, 1930, p. 33).

533. It appears to me that the various Colonies are still experimenting according to their means and circumstances, and have yet much to learn from each other before the general principles governing the successful foundation and working of an auxiliary medical service in tropical African conditions have been fully worked out and established. Difficulties abound. The problem of obtaining in sufficient numbers from the tribes we desire to serve pupils with sufficient general education, the simplification and standardisation of curricula, the standardisation of drugs and dressings, the question of suitable buildings, etc., are in themselves sufficiently troublesome. But when these are solved, other difficult practical problems such as the exact definition of the duties and status of assistants and their wise supervision will remain to be dealt with in each Colony according to its special needs.

D. DUFF.

CAPETOWN,

November, 1932.

PROGRAMME OF TRAINING UNDER NURSE-DISPENSERS' SCHEME.

Year.	Nursing.	Dispensing.
1st.	Work in the wards all the time. Lectures on elementary medical nursing, surgical nursing, anatomy and physiology—each one hour per week. Examination in medical nursing during fourth month. If they pass they go on to lectures on surgical nursing for four months. Examination. If they pass they go on to lectures on anatomy and physiology for four months and then examination. Routine practical instruction by ward sister throughout.	—
2nd.	Work in the wards all the time except for one hour a week. Training by a Medical Officer in subcutaneous and intramuscular injections and the passing of male catheters. 12–14 lectures on advanced medical and surgical nursing and anatomy and physiology. Routine practical instruction by ward sister. At the end of the 2nd year, and before proceeding to advanced whole-time instruction in the dispensing school, they have to pass an examination in medical and surgical nursing and anatomy and physiology.	One hour a week in the Dispensing school. Instruction in weights and measures, Latin names, synonyms, etc. Quarterly test.
3rd.	At the end of the 3rd year they must pass an examination in medical and surgical nursing and anatomy and physiology for the 2nd Division Bar (incremental).	All the time in the dispensing school. Materia medica (Whitla's text book); chemistry; practical work all the time; practical and theoretical Pharmacy; first aid.
4th.	Training in the theatre in anaesthetics; two students twice a week until they have induced seven general anaesthesias each. At the end of the 4th year, all nurses may, if they wish, sit for an examination in nursing and anatomy and physiology entitling them to a certificate of nursing. The standard of this examination is higher than that for the 2nd Division Bar.	Incompatibilities; physiological actions of the more important drugs; poisons and antidotes; ordinances; complete revision of work; final Druggists' Examination.
	They become nurse-dispensers if successful in Druggists' Examination at the end of the 4th year. Examination in medical and surgical nursing and anatomy and physiology for the Nursing Certificate is held about the same time as the Druggists' Examination.	—
5th.	Confirmation in appointment, if suitable, at the end of this year.	
8th.	£84 Bar examination (incremental)—a similar examination to that of third year but of a higher standard.	

APPENDIX 8.

Health Branch.

Analysis of the more important conditions dealt with in the Out-patients Department of the Child Welfare Clinics during 1932–33.

Disease.	Male.	Female.	Total.	Ratio to diseases due to all causes.
Malaria	4,477	4,356	8,833	29.9
Yaws	2,700	2,128	4,828	16.3
Diseases of infancy	1,348	1,369	2,717	9.2
Diseases of respiratory system	1,267	1,288	2,555	8.6
Parasitic skin diseases	802	791	1,593	5.3
Diarrhoea and enteritis	642	613	1,255	4.2
Constipation	469	544	1,013	3.4
Diseases of teeth, gum and mouth	385	404	789	2.6
Diseases of the eyes	236	311	547	1.8
Whooping cough	203	263	466	1.5
Intestinal parasites	188	288	416	1.4
Ulcers	172	182	354	1.2
Injuries (external causes)	202	155	357	1.2
Dysentery	190	142	332	1.1
Measles	65	60	125	.4
Diseases of lymphatic system	52	43	95	.3
Other conditions	848	2,398	3,246	10.9
Total	14,246	15,275	29,521	—

APPENDIX 9.

Quinine in the treatment of Malaria in Children.

By Miss C. D. Williams, Woman Medical Officer, Princess Marie Louise Hospital, Accra.

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534. So much has been written lately about the newer drugs that there is some danger that we may lose sight of the excellences of quinine. It may be that atebrin is a better drug socially speaking in that it destroys reservoirs of infection, and in that it is free from some of the unpleasant manifestations that may make quinine intolerable to adults. But it appears hard to improve on the therapeutic results obtained with quinine in checking the clinical manifestations of malaria in children. It is a drug that is good enough to go on with until, by cautious experiment, some other drug is proved to have all its advantages, and yet remain unconvicted of any toxic effects on children.

535. The following observations were made at the Princess Marie Louise Hospital for children, Accra, Gold Coast. The field for observation is indicated by the figures for the last two years.

536. During the period there were 31,794 cases of disease treated at the hospital, of which 11,519 were more or less uncomplicated malaria.

537. In these two years there were respectively 589 and 581 inpatients admitted. Of these 96 and 101 were for malaria. The deaths were five and eight. Of these last eight three were from cerebral malaria, three were malarial anæmia, and two are entered simply as malaria.

Only deaths from uncomplicated malaria have been included.

Children are treated up to the age of about fourteen years.

538. *Incidence of the disease.*—Accra itself is comparatively free from mosquitoes. A child born and brought up in Accra might conceivably escape malaria. But the vast majority of the hospital population is mobile. The mothers are constantly paying visits to the country to trade, to cultivate the land, or to " salute " relations, dead or alive. The babies always accompany them, and even the small children are often parked out with relations for long periods. About 50 per cent of the patients give their domicile as outside Accra. It is natural therefore that the vast majority are infected with malaria.

539. *Age of onset.*—The table below shows the age at which malaria seems to produce the greatest morbidity. It represents 421 consecutive cases of out-patients, in which treatment was sought for malaria. It shows two facts clearly :—(*a*) The commonest age for malarial attacks in the indigenous population is between three months and two years of age. (*b*) The child is comparatively well looked after in the first two years of life. It is readily brought up for treatment if it shows signs of disease. After this age the majority of the children are mismanaged and grossly neglected.

	Weeks.		Months.					Years.									
Age	2	3	1	2	3	6	9	1	2	3	4	5	6	7	10	12	14
Cases	2	3	8	26	44	88	66	85	45	16	9	8	9	6	4	3	5

540. The drop at nine months of age is due to the fact that the medical officer always has to guess the age of the patient. " One year " is a likely age that is more readily guessed than nine months. The drop therefore at this age is purely fictitious.

541. The ages in the table above are reckoned from birth on the presumption that prenatal infections are disproved.

542. MANIFESTATIONS OF THE DISEASE.

Pyrexia.—(The normal range of temperature in an African infant is about one degree lower than in an European.) Pyrexia is the commonest manifestation of malaria. It is usually easy to cure with quinine.

Hyperpyrexia is rare.—It is generally easily cured with quinine.

Malarial enteritis.—This is a common condition in infants and children. The stools are frequent, watery, undigested, generally yellow and with some mucus. The condition usually responds well to castor oil, quinine, and attention to diet.

Malarial gastritis is far less common than enteritis. The treatment is the same as for enteritis except that intramuscular quinine is more frequently required and sometimes bismuth by mouth.

Cerebral malaria is generally sudden in onset. It responds well to intramuscular quinine, assisted by a hot bath, a cold pack to the head and a rectal wash out.

Malarial bronchitis.—Some cases of bronchitis plus malaria seem to clear up very quickly on the exhibition of quinine.

Splenomegaly reacts magically to quinine in an early case. A spleen that is hard and fibrotic does not disappear until the child "grows up to his spleen." if then. Cases of an enormous spleen are rare compared with the numbers seen in some other malarious countries—for instance in Macedonia. These excessively large spleens in African children may be due to some other cause. I have not yet been able to demonstrate one of the blood diseases. A spleen in a small baby may retreat from + 4 to 0 in a week. (+ 5 being taken as the level of the umbilicus).

Cachexia is rare in children in this country. Some of the most severe cases are in children who appear fat and well nourished.

Algid malaria is by no means uncommon. It is often difficult to diagnose. It reacts well to adequate quinine.

Malarial nephrosis, nephritis and albuminuria.—These conditions are obscure, but if uncomplicated they are rarely severe. As it is often difficult and tedious in a large out-patient clinic to obtain urine, the condition is often overlooked. It generally reacts promptly to treatment.

Malarial anaemia.—This is the most important consideration. An early case responds well to quinine and iron. One that has progressed as far as œdema is usually amenable to treatment, if the treatment is prolonged and if liver juice is added to the regime. The most fatal of all types of malaria in my experience, are the ones that have become profoundly anæmic. A prompt transfusion gives the only chance of success in such cases. If the patient does not die from anæmia in the first 24 hours after admission, such is the recuperative power of the child that recovery is almost assured. For a long time such children are very subject to intercurrent infections and every observation in this country bears out the conclusions of Dr. Helen Mackay in her work on the anæmia of infants. Malaria does not often kill children, it is the anæmia caused by malaria or helminths which increases unnoticed and causes the death of a child. It is the anæmia which renders these children exceedingly subject to intercurrent infections. It is the predisposition to pneumonia, enteritis, etc., given by anæmia that produces the greater part of the child mortality. Intercurrent infections may however prove a blessing in disguise. An obvious bronchitis may goad the mother into bringing the child to the hospital. An anæmia is found and treated, and the child is rescued from death from this, the most insidious lethal process of malaria.

543. This morbidity produced by the presence of malarial parasites is well illustrated by the figures for in-patients in the year 1931–32.

	Cases.	*Deaths.*
Malaria	96	5
Broncho-pneumonia	23	5
Malaria + broncho-pneumonia	31	17

544. *Treatment.*—The routine mixture used in this hospital is as follows :—

℞

Quin. Sulph. or Hc. 1	Gr. 1
Fe. Sulph.	gr. 1 or Tinct. Fe Perchlor M.2
Ac. Sulph. Dil.	q.s.
Aq. ad	dr. 1

If the patient is constipated, then " Mist. Quin and Fe. Aperiens " is given which consists of the same mixture, with Mag. Sulph. grains 5 added

545. Cases are roughly divided into three degrees of severity.

Mild cases are treated as out-patients. They are given a week's supply of one of the above mixtures, 2 to 4 drachms, three or four times a day, depending on age, weight and condition. They are told to report in two days if no better. If the fever improves in three days, then to halve the dose of the medicine, and to come back in a week. If there is enteritis then a dose of 01. Ric. is given, a half to one ounce.

Cases of moderate severity are given a dose of intramuscular quinine gr. 6, accompanied by the treatment described above, and told to report next day if no better.

Severe cases are admitted if possible. These are generally cases in very poor condition, profoundly anaemic, cerebral, hyperpyretic, or with some serious concurrent affection. They are immediately given intra-muscular quinine grs. 6 for almost any age or size, to be repeated if necessary. They are given 01. Ric., if this seems to be indicated, and are put on large doses of one of the usual quinine mixtures. Anaemia is treated in the usual way with arsenic, injections of iron and arsenic, and liver juice. Cerebral cases are given a hot bath with a cold compress to the head, a rectal wash out and a lumbar puncture in addition. Cold sponging is strictly forbidden. Warm or tepid sponging is sometimes used. Quinine abscesses are rare. In the last three months about 300 injections of quinine have been given in this hospital. Only two abscesses have been reported, one of those was in a child who already had boils. The quinine for injection is made up three times a week at the dispensary of the Gold Coast Hospital. The injections are given into the upper part of the gluteus, one to two inches only below the crest of the ileum.

546. Quinine is never given without iron. I think the success of the treatment largely depends on this fact. The mixture is well tolerated. The African gastric mucosa is probably more long-suffering than that of the European. If there is vomiting the medicine is mixed with sugar and water. I have found that quinine hydrochloride and bi-hydrochloride are apt to cause more gastric trouble than quinine sulphate.

547. So far I have seen nothing to prove that the giving of quinine to cut short an attack has any effect in preventing the establishment of a " natural immunity to malaria."

548. I have seen no case of haematuria after quinine treatment. I have seen it cured by quinine treatment several times.

549. Prophylactic quinine is not given. But in season and out of season we preach to the mothers (1) to keep their babies under observation at the weighing clinics, where early signs of disease can be detected (2) always to use a mosquito net (3) if the child gets fever, to come at once for treatment.

550. *Case histories.*—Some case histories are attached. The first five are selected but typical cases. They are followed by a group of twelve consecutive cases for the last month. As it happens the latter were all successful ones. In some cases a loss in weight is due to a rapid loss in spleen, or to some loss of oedema. Most cases gain in weight, because vomiting or diarrhoea are stopped abruptly. In all these cases the general condition improved while in hospital. Most of them were kept under observation after discharge and the improvement was maintained.

551. When the result of " Cured"' is written, it indicates that the child was cured of the attack, not of malaria ; which, after all is the most that can be said of a large number of diseases.

552. I have to thank the Research Institute, Accra, for the blood findings and various nursing sisters and the nursing staff for the records.

553. *Conclusions.*—I should like to draw attention to the following points :—

(1) The vast majority of cases of malaria respond well to out-patient treatment.

(2) Mortality and morbidity from malaria in children are largely avoidable.

(3) Very simple methods are sufficient to reduce the chances of infection.

(4) Very simple methods are sufficient to diagnose malaria with relative certainty.

(5) Very simple treatment is sufficient to control the vast majority of the serious manifestations of malaria.

(6) Most of these measures can be carried out by persons of moderate intelligence, sanitary inspectors, school teachers, nurses, and above all, Health Visitors. They should be educated unsparingly in these matters. Every school and government building should be placarded with these facts.

(7) Nothing will prevent the West African from prescribing and compounding treatment for himself and his family. Something might be done, and it can be done with a little outlay, to improve the quality of this treatment.

(8) It is true that one case of malaria in a hundred may be lost by imperfect treatment in the actual carrying out of the suggested measures but this should surely not be allowed to weigh when one considers the enormous benefit which would accrue to the remaining ninety and nine.

CASE HISTORIES.

Case 1.—Quarmine, aged 7 months.

History. One previous attack of malaria, fever one day, b.o. 2 daily.

Condition on admission. Convulsions, 0 spleen palpable, 0 anaemia, general condition—a very fine baby. Blood—malarial parasites found.

Temperature daily max. 103.8, 100, 101, 98.2, 97.4, discharged fifth day.

Treatment 11 a.m. Intra muscular quinine gr. 6 Rep. at 1.30 p.m. 01. Ric. ½ oz. stat. Hot bath. Rectal wash out. Cold compress to head. Mist. sod. bic. and glucose ½ oz. hourly. I.M.Quin. repd. on third day. Mist. Quin. and Fe. Aperiens 3 drs. q.d.s.

Result. Cured.

Case 2.—Adu, aged 9 months.

History. Several previous attacks of malaria, often with enteritis, but was brought regularly for treatment until 6 months old when he weighed 16½ lbs. Was taken to bush, returned at 9 months, weighing 17 lbs. badly infected with malaria which did not respond to out-patient treatment.

C.O.A. Fever, sp. + 3 anaemia ++. General condition poor. Blood—no parasites seen.

Temperature daily max. 104, 101, 102.2, 100.4, 99, 100, 97, 97, etc., remaining low discharged 15th day.

Weight increased—10 ounces.

Treatment I.M.Quin. gr. 6 stat and p.r.n. Mist. Q. and F. Ap. dr. 3 q.d.s Breast feeding. Later given liver juice and put on diet.

Result. Cured.

Case 3.—Kwaku, aged 7 months.

History. None obtained.

C.O.A. sp. + 4, anaemia +++ sore eyes. B.O. 2.g.c. poor. Blood—malarial parasites present.

Treatment Mist. Q. and Fe. (Ap.) drs. 2 with Liq. Arsen. m. ½ q.d.s. Inj. Hyp. Fe. and Arsen. ½ ampoule every other day.

For three weeks there was no definite improvement.

There were attacks of fever and gastro-enteritis.

No gain in weight. Then I.M. Quin. gr. 6 was given daily for 5 days, together with Mist. Q. and Fe. Arsen. drs. 2 t.d.s.

Temperature dropped and weight gained at once.

Result. Cured. Note—from the 8th to the 25th day the child was not in the writer's charge.

Case 4.—Obieley, aged 2 years.

History. Has been sick a long time, taken to a native doctor.

C.O.A. Mal +++ sp. + 3 an. ++ jaundice slight, vomiting thrush. g.c. very poor. Blood—malarial parasites present. T. 103.2.

Treatment. 01. Ric. drs. 3 stat. I.M.Quin. grs. 6 stat. Mist. Q.F. Arsen. drs. 3 q.d.s. 10 p.m. restless, twitching, head retraction, knee jerks and abdominal reflexes both absent. I.M.Quin. gr. 6 Lumber puncture 40 c.c. clear fluid removed, sterile. 300 cells to the c.mm.

Result. Died 1 a.m.

Case 5.—Adjeley, aged 3 months.

History. Sick 5 days, taken to native doctor.

C.O.A. T. 101, vomiting, cough, sp. + 1. abdomen distended.

Treatment. Rectal wash out. I.M.Quin. gr. 6 stat. Mist. Q.F. Ap. dr. 3 q.d.s.
Result. Cured.

Case 6.—Korkor, aged 9 months.

History. Sudden onset.

C.O.A. hyperpyrexia. T.104.8, sp.+1. anaemia O.Bl. many mal. par. present.

Treatment. Tepid sponge I.M.Quin. gr. 6 at 2 p.m. Rep. at 5 p.m. Mist. Quin. and Fe. dr. 3 q.d.s.

Result. Cured.

Case 7.—Obile, aged 1½ years. C.O.A. conculsions, slight anaemia. T.104.

History. Sick 4 days fever, vomiting, B.O. 1–2 no cough.

Treatment. I.M. Quin. gr. 6 stat. Mist.Quin. and Fe. Aper. dr. 3. q.d.s.

Result. Cured.

Case 8.—Aban, aged 3 years.

History. None.
C.O.A. conculsions ++ T.104.4. Blood—malarial parasites present.
Treatment. I.M.Quin. gr. 6 stat. 01.Ric. oz. 1 stat. Hot bath. Mist. Quin. and Fe. Ap. oz. ½ t.d.s. Mist Bromid. dr. 2 p.r.n. Fluid diet.
Result. Cured.

Case 9.—Kwabla, aged 7 months.

History. Sick 3 days, T.102.2, no cough, B.O. 7, loose no blood or mucus. vomiting.
C.O.A. anaemia ++ sp. + 3 g.c. poor. Blood—no parasites seen.
Treatment. 01. Ric dr. 2 stat. I.M.Quin. gr. 6 stat. Mist. Quin. and Fe. dr. 2 q.d.s. Third day—I.H.Fe. and Arsen. ½ amp. every other day.
Result. Cured.

Case 10.—Nee Addo, aged 2½ years.

History. Sick 5 days. T.102.4, cough, vomiting B.O. 2.

C.O.A. anaemia +++ sp. + 2 g.c. poor Blood—numerous malaria parasites.

Treatment. I.M.Quin. gr. 6 stat. Mist. Quin. and Fe. Arsen. dr. 3 q.d.s. light diet, liver juice.

Result. Greatly improved.

Case 11.—Teiko, aged 1 year.

History. Fever 1 week.

C.O.A. sp. 2, anaemia + + 0 vomiting. B.O. 3. Blood—malarial parasites present. T.99.4.

Treatment. I.M.Quin. gr. 6 stat. 01. Ric. oz. ½ stat. Mist. Q. and Fe. Arsen. dr. 3 q.d.s. Light diet and liver juice.

Result. Cured.

Case 12.—Amah, aged 2 years.

History. Unsuitable food for one year, fever for 4 days, has had previous attacks.

C.O.A. small and very thin. Temp. 105, sp. + 1, anaemia + Blood—numerous malarial parasites.

Treatment. I.M.Quin. gr. 6 stat. Mist. Q. and Fe. Ap. dr. 3 q.d.s. Improved diet.

Result. Cured.

Case 13.—Kwesie, aged 4 months.

History. Quite unreliable.

C.O.A. sp. + 3 anaemia + + +, very faint purpuric spots on legs. Blood—malarial parasites numerous. T.100.2.

Treatment. I.M.Quin. gr. 6 stat. 01.Ric. dr. 2 stat. Mist Q. and Fe. dr. 3 q.d.s. liver juice dr. ½ b.d. Breast feeding 3 hourly.

Result. Cured.

Case 14.—Ashicho, aged 1½ years.

History. Fever for three days.

C.O.A. sp. + 3 anaemia slight, g.c. fair. Blood—malarial parasites present. T.104.

Treatment. I.M.Quin. gr. 6 stat. 01.Ric. oz. ½ stat. Mist. Quin. and Fe. dr. 3 q.d.s. ordinary diet.

Result. Cured.

Case 15.—Ouati, aged 11 months.

History. Convulsions 2 hours.

C.O.A. convulsions sp. + 1 anaemia slight. Blood—malarial parasites present. T.98.

Treatment. I.M.Quin. gr. 6 stat. hot bath. Ice to head, rectal wash out. Lumber puncture—25 c.c. clear fluid, sterile 200 cells per c.mm. Mist. Q. and Fe. Ap. dr. 3 q.d.s.

Result. Cured.

Case 16.—Dedei, aged 6 months.

History. Sick 2 weeks, fever and vomiting.

C.O.A. sp. + 3 anaemia +++ B.O. 1–2 oedema slight. Blood—malarial parasites present. T.101.8.

Treatment. I.M.Quin. gr. 6 stat, and rep. p.r.n. Mist. Q and Fe. Arsen. dr. 3 q.d.s.

Result. Cured. On discharge anaemia much improved.
No palpable spleen. Temperature normal.

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