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British Guiana.

REPORT

OF THE

SURGEON-GENERAL,

FOR THE YEAR

1931.

Printed by the Authority of His Excellency the Governor.

GEORGETOWN, DEMERARA :

"THE ARGOSY" COMPANY, LIMITED, PRINTERS TO THE GOVERNMENT OF BRITISH GUIANA.

1932.

No. 15,925.



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Surgeon General,
British Guiana.*

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Surgon General
British Empire

C.S.O. No. 2673/32.



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1931

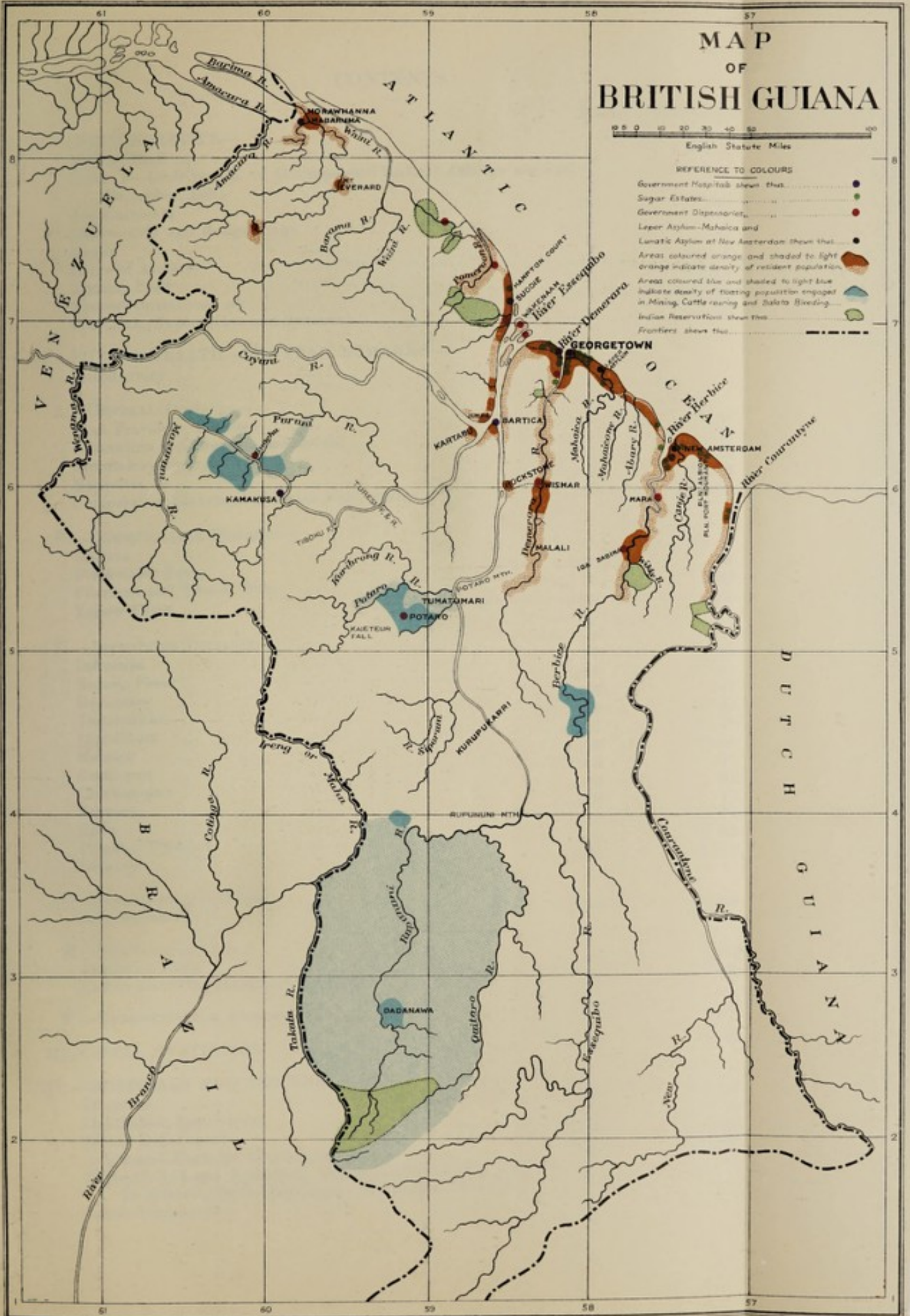
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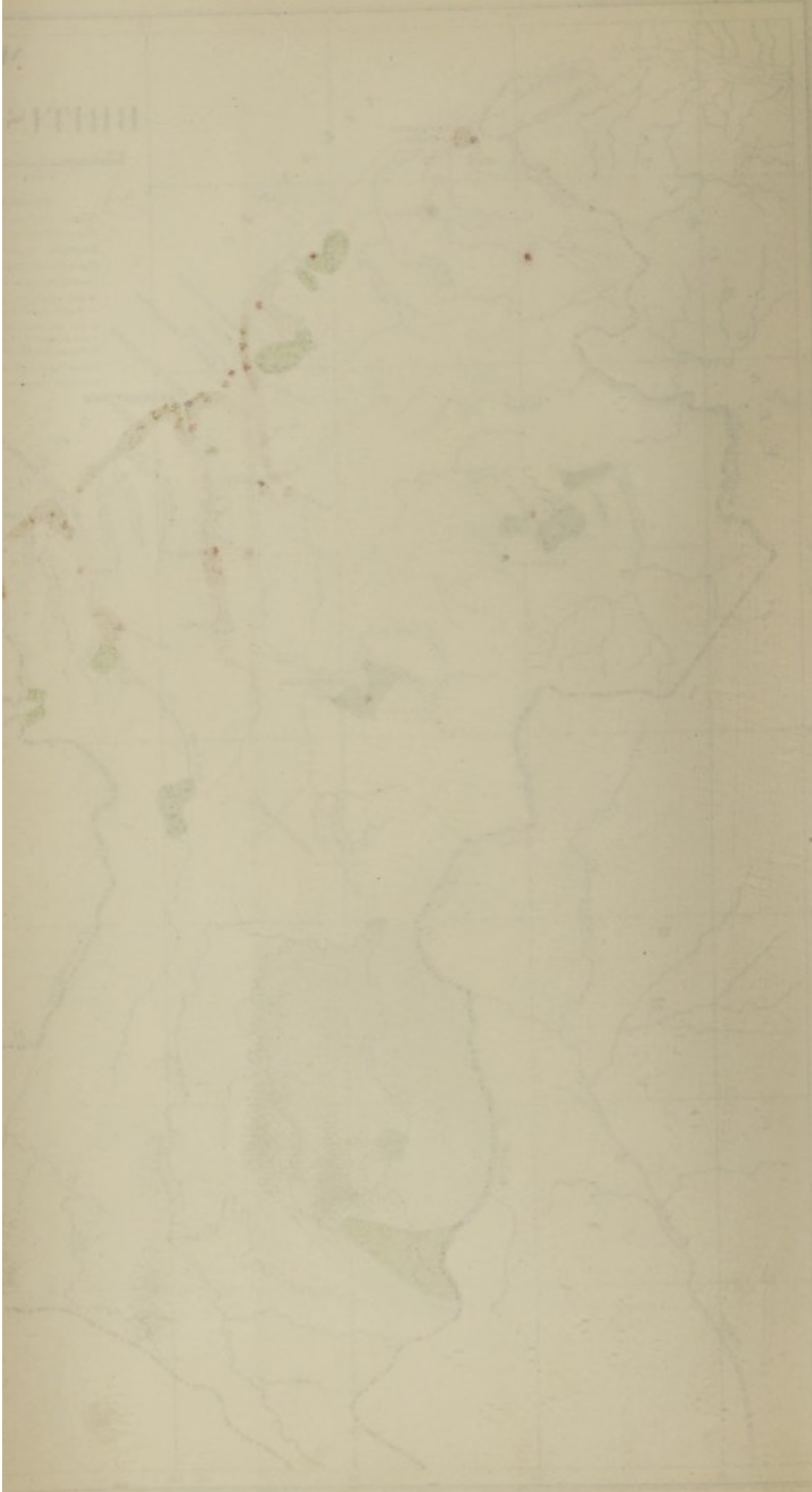
MAP OF BRITISH GUIANA

0 10 20 30 40 50 60
English Statute Miles

REFERENCE TO COLOURS

- Government Hospitals show this ●
- Sugar Estates ■
- Government Dispensaries ●
- Leprosy Asylum-Mahaica and Lunatic Asylum at New Amsterdam show this ●
- Areas coloured orange and shaded to light orange indicate density of resident population ■
- Area coloured blue and shaded to light blue indicate density of floating population engaged in Mining, Cattle raising and Salata Bleeding ■
- Indian Reservations show this ■
- Frontiers show this





PTIII

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SURGEON-GENERAL'S OFFICE,
GEORGETOWN, DEMERARA,
23rd June, 1932.

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 for the Colonies, the Medical Report on the health and sanitary conditions of British Guiana for the year 1931 together with the Returns, etc., appended thereto.

I have the honour to be,
Sir,
Your obedient Servant,

P. JAMES KELLY,
Surgeon-General.

The Honourable
THE COLONIAL SECRETARY.

BRITISH GUIANA.

ANNUAL MEDICAL REPORT FOR THE YEAR ENDING 31st
DECEMBER, 1931.

I.—ADMINISTRATIVE.

1. The Medical Staff as authorised by the Estimates (1931) consists of :—

- 1 Surgeon-General.
- 1 Government Medical Officer of Health.
- 2 Assistant Government Medical Officers of Health.
- 1 Bacteriologist and Pathologist.
- 1 Surgeon Specialist and Resident Surgeon, Public Hospital, Georgetown.
- 1 Medical Superintendent, Leprosy Hospital.
- 1 Ophthalmologist.
- 28 Government Medical Officers.

2. The distribution of the staff on the 31st December, 1931, is shown in Table 1 :—

Appointments.

3. Dr. H. D. Weatherhead was appointed a Government Medical Officer on 1st March, having been transferred from the Antigua Medical Service.

4. Dr. S. L. Kochhar was appointed Medical Officer of the Mahaicony District on the 1st September on a non-pensionable subsidy from Government.

Retirements and Resignations.

5.—(a) Dr. R. Huey resigned his appointment as a Government Medical Officer on 5th February, 1931.

(b) Dr. R. S. Millar retired on pension as from 25th September, 1931.

(c) Mr. F. A. Angoy, Steward, Mental Hospital, Berbice, and Mr. E. Lincoln, 1st Class Dispenser, retired on pension as from 1st January, 1931, and 1st October, 1931, respectively.

(d) Miss M. Donald, Matron, Mental Hospital, retired on pension as from 10th May, 1931.

Death.

6. I regret to record the death of Mr. H. T. Dash, Issuer, Public Hospital, Berbice, on 16th January, 1931.

Leave of Absence.

7. The following officers were on leave of absence out of the Colony during the year:—

Dr. V. V. H. Hoakai, Government Medical Officer, from 1st January to 5th February, 1931; Dr. A. G. Coia, Government Medical Officer, from 5th March, 1931, to 3rd December, 1931; Dr. J. A. Browne, Government Ophthalmologist, from 10th March, 1931, to 29th July, 1931; Mr. J. D. Grierson, Surgeon Specialist and Resident Surgeon, Public Hospital, Georgetown, from 8th May, 1931, to 5th November, 1931; Miss L. de Freitas, Matron, Public Hospital, Georgetown, from 10th March, 1931, to 9th September, 1931; Dr. J. Fung, Dental Surgeon, from 1st January to 13th March, 1931.

8. Dr. G. A. Grandoult, Government Medical Officer, was granted as from 26th June, 1931, six months full pay and two months half pay vacation leave on account of illness, with permission to spend this leave in the Colony.

9. The following officers were on short periods of vacation leave in the Colony:—

(i) Mr. M. Murray, 1st Class Dispenser, from 7th April to 17th May, 1931.

(ii) Mr. E. Lincoln, 1st Class Dispenser, from 1st July to 30th September, 1931.

(iii) Dr. R. S. Miller, Government Medical Officer, from 1st to 24th September, 1931.

(iv) Mr. W. B. Telford, 1st Class Dispenser, from 4th October to 31st December, 1931.

(v) Mr. F. C. L. Glasgow, 1st Class Dispenser, from 24th November to 31st December, 1931.

Nursing Staff.

10. There are five European Nurses attached to institutions as under:—

(a) Public Hospital, Georgetown—

Superintendent of Nurses—Miss V. M. Meade.

Divisional Sisters—Miss D. E. Hill, Miss N. M. C. Horrocks and Miss M. G. Morris.

(b) Public Hospital, New Amsterdam—

Superintendent of Nurses—Miss K. Welch.

11. Mrs. H. Hunter, Superintendent of Nurses, Public Hospital, Georgetown, was granted $3\frac{7}{8}$ months full pay vacation leave from 8th April, 1931. Her appointment was terminated with effect as from 15th July, 1931, on grounds of ill-health.

12. Miss V. M. Meade, Divisional Sister, Public Hospital, Georgetown, on the expiration of her contract was granted 4 months full pay leave from 20th March, 1931, and returned to England. She was re-engaged as a Divisional Sister as from 31st August, 1931, and was subsequently appointed Superintendent of Nurses, Public Hospital, Georgetown, on 1st September, 1931.

13. Miss K. Welch, Superintendent of Nurses, Public Hospital, Berbice, was granted 4 months full pay leave from 24th November, 1931, on the expiry of her contract and returned to England.

14. Miss M. Guidera resigned her appointment as Divisional Sister, Public Hospital, Georgetown, on 31st March, 1931, and returned to England.

15. Miss N. M. C. Horrocks and Miss M. G. Morris arrived in the Colony on 26th November, 1931, and assumed duty as Divisional Sisters, Public Hospital, Georgetown, on 27th November, 1931. Miss Horrocks was transferred to the Public Hospital, New Amsterdam, to act as Superintendent of Nurses on 21st December, 1931.

16. In the interval between the resignation of Miss Guidera and the arrival of Miss Horrocks and Miss Morris, Mrs. Good acted as Divisional Sister at the Public Hospital, Georgetown, from 7th April, 1931, to 21st November, 1931.

Ordinances, Regulations, etc.

17. The following Ordinance was passed during the year :—

The Leprosy Ordinance, 1931, to make better provision for the treatment, care and isolation of persons suffering from leprosy.

This Ordinance repealed the Lepers Ordinance, 1905.

18. The following Regulations and By-laws were also made during the year :—

(a) The Dangerous Drugs (Licensing) Conditions, 1931, setting out the conditions under which dangerous drugs licences may be issued.

(b) The Midwives (Training) Regulations, 1931, prescribing the course of training and examination of Midwives.

(c) The Chemists and Druggists (Training and Examination) Regulations, 1931, prescribing the course of training and examination of Chemists and Druggists.

Financial.

19. The following is a comparative statement of revenue and expenditure for the years 1929, 1930 and 1931 :—

(a) Revenue—Medical Department.

1929.	1930.	1931.
\$55,867.64 (includes \$4,274.10 for Medical Officers' Rents).	\$46,391.80 (includes \$3,225 for Medical Officers' Rents).	\$43,430.86 (includes \$2,737.10 for Medical Officers' Rents).

(b) Expenditure—Medical Department including Public Health Department.

1929.	1930.	1931.
\$621,538.88	\$568,895	\$547,034

20. The percentage of actual expenditure on Medical and Public Health Services to actual revenue of the Colony was :—

1929.	1930.	1931.
10.3%	11.7%	12.4%

II.—PUBLIC HEALTH.

21. The health of the Colony was good and generally there was an absence of any special epidemic disease. The number of deaths registered as due to Malaria shows a substantial decrease on the figures for the previous three years.

GENERAL REMARKS.

A.—General Diseases.

22. The most prevalent general diseases are those which relate to the Respiratory and Circulatory Systems and acute and chronic Nephritis.

(i) *Pneumonia and Broncho-Pneumonia.*—

23. 264 cases were treated in public hospitals, with 131 deaths, as against 278 cases with 134 deaths in 1930. The total number of deaths registered in the whole Colony was 563 as against 588 the previous year.

(ii) *Circulatory System.*—

24. 437 cases of all forms of Heart Disease were treated in public hospitals, with 167 deaths, as against 430 cases, and 165 deaths in 1930. The above figures do not include diseases of the arterial, venous and lymphatic system.

(iii) *Nephritis.*—

25. 473 cases of Nephritis were treated in public hospitals with 124 deaths, as compared with 449 and 111 respectively for 1930. The total number of deaths from Nephritis registered in the whole Colony was 487 as against 528 in 1930.

26. Below is given a Table showing the number of in-patients with acute and chronic Nephritis, together with deaths and case mortality, in public hospitals of the Colony for the last ten years :—

	Cases.	Deaths.	Case Mortality.
1922	745*	242*	32.4%*
1923	779*	184*	23.6%*
1924	763*	221*	28.9%*
1925	976	214	21.9%
1926	763	190	24.9%
1927	794	206	25.9%
1928	495	161	32.5%
1929	484	143	29.5%
1930	449	111	24.7%
1931	473	124	26.2%

*Amended to include Uraemia.

27. As in previous years the prevalence of this disease, especially in children and young adults, appears to be influenced by the malarial incidence.

28. The following Table furnishes a comparative statement of diseases treated, with deaths, in Government Hospitals during the years 1929, 1930 and 1931:—

	1929.		1930.		1931.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Malaria	2,293	164	2,224	129	1,847	112
Blackwater Fever	11	3	12	4	7	3
Dysentery	144	16	203	19	173	21
Enteric Fever	91	24	124	29	94	23
Diarrhoea and Enteritis and Colitis	352	69	289	67	287	63
Ancylostomiasis	134	6	171	21	133	8
Filariais (and Filarial Bubo)	291	11	243	7	226	9
Heart Disease* (all forms)	363	152	439	165	437	167
Nephritis (including Uraemia)	484	143	449	111	473	124
Pneumonia (including Broncho and Lobar)	389	197	278	134	264	131
Tuberculosis (including Phthisis)	368	127	383	143	453	164
Influenza	42	...	79	3	235	14

29. The deaths registered as due to the same diseases throughout the Colony for the same periods are as follows:—

	1929.	1930.	1931.
Malaria	1,198	1,104	834
Blackwater Fever	11	12	12
Dysentery	141	105	128
Enteric Fever	44	53	52
Enteritis (including Diarrhoea)	448	380	397
Ancylostomiasis	10	28	14
Filariais (including Filarial Bubo)	52	37	43
Heart Disease (all forms)	351	329	383
Nephritis (including Uraemia)	514	528	487
Pneumonia (including Broncho and Lobar)	661	588	563
Tuberculosis (including Phthisis)	276	302	287
Influenza	121	94	185

30. The diseases responsible for the highest number of deaths for the whole Colony during the years 1929, 1930 and 1931, arranged in quarterly periods, are shown in the following Table:—

Diseases.	March Quarter.			June Quarter.			Septem'r Q'rter.			Dec'mber Q'rter.			Total.		
	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.
Fevers (Malarial and others)	337	307	218	227	232	148	299	278	253	335	287	215	1,198	1,104	834
Pneumonia and Bronchitis	287	319	317	229	205	141	243	233	210	273	187	274	1,032	944	942
Kidney Diseases	133	139	137	132	126	111	112	138	124	148	132	119	525	535	491
Diseases of early Infancy (including Premature Birth, Infantile Debility, etc.)	155	196	169	113	109	111	109	144	110	223	207	180	609	656	570
Bowel Complaints (including Dysentery, Diarrhoea, Enteritis, etc.)	226	203	189	126	121	122	114	89	118	188	137	165	654	650	594
Phthisis and other forms of Tuberculosis	82	77	71	58	64	72	61	81	78	75	89	66	276	302	287

31. The quarterly rainfall for the same period as taken at the Botanic Gardens, (Georgetown), was:—

	1929.	1930.	1931.
1st Quarter	11.44	13.04	6.30
2nd Quarter	33.04	35.16	24.23
3rd Quarter	15.99	26.23	23.29
4th Quarter	11.15	10.44	15.44
Total	71.62	84.87	69.26

32. The statement below is a return of deaths occurring in the whole Colony during each quarter of the year for the past three years :—

	1929.	1930.	1931.
1st Quarter ...	2,041	2,060	2,055
2nd Quarter ...	1,539	1,524	1,390
3rd Quarter ...	1,654	1,708	1,673
4th Quarter ...	2,047	1,882	1,730

B.—Communicable Diseases.

MOSQUITO OR INSECT-BORNE.

(i) *Malaria.*—

33. 1,847 cases were treated in public hospitals, with 112 deaths, as compared with 2,224 cases with 129 deaths in 1930. The total number of deaths registered as due to malaria for the whole Colony was 834 in 1931, as against 1,104 in 1930.

34. Both as regards the number of cases treated in Public Hospitals, and in regard to deaths the statistics for 1931 manifest a satisfactory decline.

35. Below is given a Table showing the total in-patients of public hospitals, the number of malarial cases and deaths together with the case mortality, and the annual rainfall as taken at the Botanic Gardens (Georgetown) for the ten years 1922–1931 :—

HOSPITALS.					
Year.	Total In-Patients.	Cases Malaria including Black-water Fever.	Deaths Malaria including Black-water Fever.	Case Mortality.	Rainfall (Inches).
1922 ...	15,605	1,609	75	4.7%	102.04
1923 ...	18,198	1,699	77	4.5%	89.52
1924 ...	17,565	1,815	93	5.1%	88.18
1925 ...	19,025	1,914	77	4.0%	63.25
1926 ...	18,481	1,308	107	8.2%	89.32
1927 ...	20,671	3,188	184	5.8%	118.63
1928 ...	20,126	2,607	156	6.0%	96.48
1929 ...	19,577	2,394	167	7.2%	71.62
1930 ...	19,657	2,236	133	5.9%	84.87
1931 ...	18,276	1,854	115	6.2%	69.26

(ii) *Blackwater Fever.*—

36. Twelve deaths were registered in the whole Colony as due to this disease, the number of deaths being the same as in the previous year. In public hospitals 7 cases were treated with 3 deaths.

(iii) *Filariasis and Filarial Bubo.*—

37. 226 cases were treated in public hospitals, with 9 deaths, as against 243 cases with 7 deaths in 1930. The deaths registered in the whole Colony as due to the same disease were 43, as against 37 in 1930.

(iv) *Yellow Fever.*—

38. As for many years past no case occurred.

C.—Infectious Diseases.

(i) *Influenza.*—

39. 235 cases were treated in public hospitals, with 14 deaths, as compared with 79 cases with 3 deaths in 1930. The deaths registered as due to the same disease throughout the Colony were 185, as against 94 in 1930.

(ii) *Enteric Fever.*—

40. 94 cases were treated in public hospitals with 23 deaths as compared with 124 cases with 29 deaths in 1930.

41. The total number of cases notified in the whole Colony was 250 with 52 deaths as against 244 with 53 deaths in 1930.

(iii) *Dysentery (including amoebic, bacillary and other forms)*—

42. 173 cases were treated in public hospitals, with 21 deaths, as against 203 cases, with 19 deaths in 1930. The deaths registered in the Colony numbered 128 as against 105 in 1930.

(iv) *Tuberculosis*—

43. The number of cases notified during the year was 382 (372 being pulmonary and 10 being due to other forms), as against 331 in 1930. The deaths numbered 287 as against 302 the previous year.

44. 453 cases, with 164 deaths, were treated in public hospitals as against 383 cases, with 143 deaths in 1930. Of the hospital cases 436 were pulmonary, with 159 deaths, and 17 cases with 5 deaths were due to other forms of Tuberculosis.

45. The number of beds in the Best Sanatorium for the treatment of Tuberculosis is 37.

46. The Table below furnishes a statement of the total number of cases treated in each of the hospitals of Georgetown, New Amsterdam and Best Sanatorium, with deaths :—

Hospital.	Cases (All forms).		Deaths (All forms).	
	1930.	1931.	1930.	1931.
Georgetown	224	274	103	118
New Amsterdam	61	83	19	29
Best	76	77	12	12

(v) *Diphtheria*.—

47. 13 cases were treated in public hospitals with 6 deaths, as compared with 21 cases with 7 deaths in 1930.

48. The number of cases notified in the whole Colony was 36 as compared with 38 in 1930, and the number of deaths registered was 9 as against 11 in 1930.

(vi) *Measles*.—

49. 2 cases were treated in public hospitals with no deaths, as compared with 66 cases with 2 deaths in 1930.

50. No cases were treated in the Out-patient Departments, as against 57 in 1930.

(vii) *Small-pox*.—

51. No case occurred during the year.

(viii) *Chicken-pox*.—

52. 55 cases were treated in public hospitals with no deaths as compared with 22 cases with no deaths in 1930. The number of cases notified in the whole Colony as due to this disease was 70 as against 74 in 1930.

(ix) *Tetanus*.—

53. 22 cases were treated in public hospitals with 15 deaths, as against 35 cases with 20 deaths in 1930.

(x) *Yaws*.—

54. 18 cases were treated in public hospitals with no deaths, as compared with 20 cases with no deaths in 1930.

55. 71 cases were treated in the Out-patient Departments as against 214* cases in 1930.

*Includes cases attending on more than one occasion, i.e., repeat cases.

(xi) Venereal Diseases.—

56. The following Table gives the number of cases of venereal diseases treated in public hospitals for the last ten years (in-patients):—

	SYPHILIS.					Soft Chancere.	Gonorrhoea and its Complications.	Granuloma Venereum.
	Primary.	Secondary.	Tertiary.	Hereditary.	Stage not Indicated.			
1922	195	68	317	23	*	62+	290‡	45
1923	92	79	376	9	*	153+	213‡	68
1924	85	34	190	46	*	70+	281‡	78
1925	112	16	296	33	*	27	336	*
1926	128	93	361	22	*	51	224	*
1927	246	16	597	39	...	6	195	123
1928	157	38	418	88	1	170	372	145
1929	228	31	352	67	9	120	616	150
1930	271	44	471	37	31	38	626	111
1931	214	121	782	123	68	12	526	57
	1,728	540	4,160	487	109	709	3,679	757

NOTES:—*Included in other figures in case of Syphilis. Not specifically mentioned in case of Granuloma Venereum, and classed under other general headings not listed.

+Under the heading "Chancres and ulceration of penis."

‡Under the heading "Gonorrhoea" but including complications.

57. The number of Novarsenobillon and other injections given for Syphilis at the public hospitals was 20,671 as against 11,665 in 1930.

58. The Tables below furnish statements, classified in age-incidence periods, of in-patients treated for venereal diseases in public hospitals, prisons and the Alms House during the year 1931:—

(i.)—PUBLIC HOSPITALS.*

Ages.	SYPHILIS.									Gonorrhoea and its complications.			Chancroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.†			M.	F.	T.	M.	F.	T.	M.	F.	T.
	M.	F.	T.	M.	F.	T.	M.	F.	T.									
Under 1 year	...	...	...	...	...	...	24	20	44	15	9	24	...	...	...	...	...	...
1 to under 5	...	2	2	...	...	...	10	8	18	...	1	1	...	...	...	...	...	...
5 " 10	1	...	1	...	...	...	10	8	18	9	4	13	...	...	...	...	...	...
10 " 20	35	16	51	15	23	38	41	75	116	53	57	110	5	1	6	5	3	8
20 " 30	86	18	104	24	21	45	158	122	280	241	95	326	10	...	10	16	10	26
30 " 40	31	13	44	14	13	27	155	89	244	138	30	168	3	...	3	7	8	15
40 " 60	19	3	22	6	6	12	178	65	243	106	8	114	1	...	1	10	2	12
60 and over	2	1	3	...	1	1	33	13	46	20	...	20	...	...	...	1	...	1
Total	174	53	227	59	64	123	609	400	1,009	582	204	786	19	1	20	39	23	62

*NOTE.—The totals in this Table differ from those in the Table above in that cases of double infection are here included. †Include Hereditary and "Stage not indicated."

(ii.)—GEORGETOWN AND NEW AMSTERDAM PRISONS AND ALMS HOUSE.

Ages.	SYPHILIS.									Gonorrhoea and its complications.			Chancroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.*			M.	F.	T.	M.	F.	T.	M.	F.	T.
	M.	F.	T.	M.	F.	T.	M.	F.	T.									
Under 1 year	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to under 5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 " 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 " 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20 " 30	1	...	1	...	...	...	1	3	4	4	...	4	...	...	4	2	6	
30 " 40	...	...	...	...	...	...	4	5	9	2	...	2	...	...	2	...	2	
40 " 60	1	...	1	...	...	...	17	1	18	1	...	1	1	...	1	6	6	
60 and over	...	...	...	...	...	...	4	...	4	...	...	...	...	...	...	...	...
Total	2	...	2	...	...	...	26	9	35	7	...	7	1	...	1	12	2	14

*Include "Hereditary" and "Stage not indicated."

59. The following Table shows the number of out-patient attendances at Public Hospitals and Government Dispensaries for the past three years:—

	1929.		1930.		1931.	
	Public Hospitals.	Government Dispensaries.	Public Hospitals.	Government Dispensaries.	Public Hospital*.	Government Dispensaries.
Gonorrhœa and its complications ...	2,835	149	2,472	187	6,035	165
Chancroids ...	155	20	6	31	117	8
Syphilis (including Tertiary) ...	2,917	251	5,791	95	14,844	84
Granuloma Venereum and Pudendi ...	*62	...	*89	...	270	...

*Previously recorded under Gonorrhœa.

60. The Tables below furnish statements, classified in age-incidence periods, of out-patients (new cases) treated at public hospitals, Government Dispensaries, and prisons during the year 1931:—

(i.) PUBLIC HOSPITALS.

Age.	SYPHILIS.									Gonorrhœa and its complications.			Chancroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.*											
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Under 1 year ...	2	2	4	...	...	...	44	39	83	...	1	1	...	...	...	...	...	...
1 to under 5 ...	1	1	2	...	...	...	18	20	38	...	1	4	5	...	...	...	...	...
5 " 10 ...	...	...	...	...	3	3	24	18	42	...	9	3	12	...	...	...	...	...
10 " 20 ...	43	20	63	26	26	52	122	168	290	195	55	250	7	1	8	2	4	6
20 " 30 ...	159	12	171	77	37	114	297	365	662	607	126	733	14	1	15	20	6	26
30 " 40 ...	33	3	36	30	10	40	238	203	441	308	47	355	6	...	6	8	4	12
40 " 60 ...	35	...	35	6	...	6	212	157	369	129	11	140	...	...	...	1	2	3
60 years and over ...	...	...	...	...	1	1	21	9	30	14	...	14	...	...	...	1	...	1
Total ...	273	38	311	139	77	216	976	979	1,955	1,263	247	1,510	27	2	29	32	16	48

* Include "Hereditary" and "Stage not indicated."

(ii.) GOVERNMENT DISPENSARIES.

Ages.	SYPHILIS.									Gonorrhœa and its Complications.			Chancroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.*											
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Under 1 year ...	1	1	2	1	1
1 to under 5	1	1
5 " 10
10 " 20 ...	4	...	4	2	...	2	...	4	4	11	7	18	1	...	1	...	...
20 " 30 ...	3	2	5	...	2	2	4	5	9	52	6	58	5	...	5	...	...
30 " 40 ...	1	1	2	4	2	6	2	5	7	26	1	27	1	...	1	...	...
40 " 60 ...	...	...	...	2	...	2	4	1	5	13	1	14	1	...	1	...	...
60 years and over ...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...
Total ...	9	5	14	8	4	12	10	16	26	103	15	118	8	...	8	...	...

* Include "Hereditary" and "stage not indicated."

(iii.)—GEORGETOWN AND NEW AMSTERDAM PRISON.

Ages.	SYPHILIS.									Gonorrhœa and its Complications.			Chaneroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.*											
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Under 1 year
1 to under 5
5 " 10
10 " 20	...	8	...	8	...	...	...	...	...	7	...	7	1	...	1	...	...	...
20 " 30	...	14	...	14	1	...	1	...	3	34	...	34	3	...	3	7	...	7
30 " 40	...	9	...	9	...	...	...	...	1	14	...	14	...	...	...	4	...	4
40 " 60	...	1	...	1	...	...	...	...	...	6	...	6	...	...	...	1	...	1
60 years and over	1	...	1	...	...	...	...	...	...
Total	...	32	...	32	1	...	1	...	4	62	...	62	4	...	4	12	...	12

* Include " Hereditary " and " Stage not indicated."

61. The number of cases of venereal diseases treated on Sugar Estates for the past three years was :—

	1929.	1930.	1931.
Gonorrhœa	...	118	98
Chaneroids	...	4	5
Syphilis (including Tertiary)	...	47	64
Granuloma venereum and pudendi	5

62. Classified in age-incidence periods the in-patients treated on Sugar Estates during the year 1931 were as follows :—

Ages.	SYPHILIS.									Gonorrhœa and its complications.			Chaneroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.*											
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Under 1 year	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 to under 5	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 " 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10 " 20	...	1	1	...	...	...	3	...	3	9	14	23	...	...	...	...	...	...
20 " 30	4	...	4	1	1	2	3	3	6	36	16	52	1	1	2	...	1	1
30 " 40	3	...	3	...	...	...	7	1	8	18	6	24	2	...	2	...	...	...
40 " 60	2	...	2	...	...	...	9	1	10	15	4	19	3	...	3	...	...	...
60 years and over	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Total	12	2	14	1	1	...	22	5	27	78	40	118	7	1	8	...	1	1

* Include " Hereditary " and " Stage not indicated."

63. The Table below shows the out-patients (new cases) treated on Sugar Estates during the year 1931, classified in age-incidence periods :—

Ages.	SYPHILIS.									Gonorrhœa and its complications.			Chaneroids.			Granuloma Venereum and Pudendi.		
	Primary.			Secondary.			Tertiary or Chronic.*											
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Under 1 year	2	...	2	...	...	...	...	...	...
1 to under 5	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 " 10
10 " 20	4	1	5	3	2	5	1	...	1
20 " 30	25	4	29	4	...	4	2	...	2
30 " 40	2	2	9	1	10	1	...	1	1	...	1
40 " 60	5	1	6	...	...	...	...	...	...
60 and over	1	...	1	...	...	...	...	...	...
Total	...	1	1	...	...	...	...	2	2	46	7	53	8	2	10	4	...	4

* Include " Hereditary " and " Stage not indicated."

64. Below are furnished extracts from the Report of Dr. E. G. H. Payne, M.B., Ch.B., Medical Officer in charge of the Venereal Diseases Clinic at the Public Hospital, Georgetown:—

“The Clinic continued to be conducted in the Department specially arranged for the treatment of Venereal Diseases in both sexes.

“Male Clinics were held on Tuesday and Friday afternoons from 12.30 p.m. to 4.30 p.m. A Male Clinic was also instituted on Wednesday afternoons, and a short session for Males was held on Saturday afternoons from 1 p.m. to 2 p.m.

“Female Clinics were held on Monday and Thursday afternoons from 12.30 p.m. to 4.30 p.m.

“In order to meet as far as possible the demands of the Male working section, the Clinic was open for all day intermediate treatment from 7 a.m. to 5 p.m. with the exception of Monday and Thursday afternoons when Female sessions were in progress.

“The intermediate treatment of women was conducted in the Female dressing room of the New Out-patient Dispensary close by.

“All Pathological examinations were carried out in the Government Bacteriological Department. Details of these examinations may be got on reference to the report of Government Bacteriologist and Pathologist.

“For diagnostic purposes, and for test of cure of Syphilis cases, the Wasserman reaction, according to Harrison's method, was universally practised. In the treatment of Syphilis cases, the method of giving an Arseno-Benzol Compound at same time as a preparation of Bismuth intramuscularly, on the lines recently suggested by Colonel Harrison and practised in the St. Thomas' Clinic, London, was followed in the majority of cases.

“The Arseno-Benzol Compounds used were Novarsenobillon, Novarsan, Neo-arsphenamine, Neo-Silver-Salversan, Sulphostab and Sulpharsphenamine, the latter two intramuscularly mainly for treatment of infants and young children.

“The Bismuth preparation used was Bismostab.

“*Side Effects.*—There were four cases of Dermatitis and two cases of Jaundice. These effects were observed early during treatment and were not due to higher dosage of .9 grms. used. Mild vomiting was occasionally observed.

“Defaulting continued to be observed but the incident of defaulting was relatively lower than in preceding years and this was especially observed in the treatment of female cases of Syphilis.

“The incidence of defaulting in the male was due mostly to men drifting away in search of employment and failing to notify the Doctor that they were leaving the district.

“The incidence of Chancroid and ulcerating Granuloma of the Pudendum appears to have been considerably reduced.

“*Propaganda.*—Attention to this phase was continued during the year by short talks to all New Cases. Three pamphlets have been prepared and will be used to amplify this section of the work during the present year.

“The Clinic continued to receive from the Ante-Natal Centres cases of Syphilis in expectant mothers and in the newly-born of mothers infected with Syphilis.

“The Georgetown Infant Welfare and Ante-Natal Clinic notified that 164 cases were referred for treatment. Of these 95 attended and availed themselves of treatment. 30 other cases referred from other centres also attended thus making 194 mothers referred, of whom 125 availed themselves of treatment.

“The proportion of new Gonorrhoea cases to new cases of Syphilis

“ was 1 to 1.7 (nearly). The new cases of Syphilis in Primary and Secondary stages represented 17.9 per cent. of the total number of new cases of Syphilis.

“ The number of newly-infected cases of Gonorrhœa represented 44 per cent. of all new cases of Gonorrhœa. The ratio of early Syphilis to early Gonorrhœa was 1 to 1.45.

“ The peak age of infection was 20.30 for both male and female cases of Syphilis and Gonorrhœa. In general, it may be said that the attention of the public is increasingly being focussed on the very useful preventive and curative aspects of the V.D. Clinic. In spite of this observation, it ought to be said that Gonorrhœa continues to be looked upon as a disease of lesser importance, with the result that men continue to apply for treatment to the unqualified who hold out by persuasive language and advertisement magical cures for “ Disorders of men and women.” It is hoped that in the distribution of propaganda leaflets which have been prepared, we shall see a larger number of men coming forward for treatment of Syphilis and Gonorrhœa in the very earliest stages when the possibility of ensuring a cure may be facilitated, thus making it possible to reduce the transmission of infection by rendering them non-infective, at the earliest possible moment. Statistical details are provided in Appendix A.”

APPENDIX A.

TABLE I.—QUARTERLY INCIDENCE OF NEW CASES OF SYPHILIS AND GONORRHOEA.

Quarter ending	Sy. (1).	Sy. (2).	Sy. (3).	Acute G.	Ch. G.
March ...	37	21	279	199	132
June ...	59	16	424	117	153
September ...	70	30	370	169	126
December ...	35	24	265	190	149

TABLE II.—OLD CASES.

March ...	27	4	200	23	50
June ...	28	16	285	7	21
September ...	41	14	421	63	130
December ...	45	13	436	64	112

TABLE III.—NEW CASES.

Quarter ending	Chaneroid.	Granuloma Pudendi.
March ...	2	4
June ...	3	12
September ...	12	6
December ...	10	8

TABLE IV.—ATTENDANCES OF ALL CASES.

Quarter ending	Syphilis.	Gonorrhœa.	Ab. C. Injections.	Bismuth Injections.
March ...	1,878	805	1,514	151
June ...	3,070	1,288	2,453	1,290
September ...	3,945	1,627	2,445	2,377
December ...	3,866	1,524	2,303	1,666
Total ...	12,759	4,744	8,715	5,484

TABLE V.—ACTUAL NUMBER OF PATIENTS TREATED IN CLINIC.

	Male.	Female.	Total Male and Female.
Sy. (1) ...	154	15	169
Sy. (2) ...	45	21	66
Sy. (3) ...	386	613	999
Double infections			
Sy. (1) & G. ...	27	6	33
Sy. (2) & G. ...	18	1	19
Sy. (3) & G. ...	146	23	169
Cong. Syph. ...	53	102	155
Gonorrhoea ...	672	101	773
Con. Syph. & Gonoh. ...	7	7	14
Total ...	1,508	889	2,397

NOTE.—

Sy. (1)—Primary Syphilis.

Sy. (2)—Secondary Syphilis.

Sy. (3)—Tertiary Syphilis.

Ab. C. injections—Arseno-Benzol Compound injections.

(xii) *Leprosy.*—

65. The buildings in the Leprosy Hospital Compound are capable of accommodating 446 patients—281 males and 165 females.

66. The highest and the lowest total number of inmates in the Leprosy Hospital was 284 and 248 respectively.

67. The daily average number of inmates resident during the year was 159.0 males and 101.7 females—total 260.7.

68. The number of patients treated in the hospital and infirmary as in-patients was 131.

69. There were 27 deaths, 15 males and 12 females, during the year, giving a death-rate of 7.0 per cent. of the total number of inmates.

70. The number of new cases admitted was 57—33 males and 24 females—as compared with 34 males and 23 females in 1930.

71. The following are extracts from the Annual Report for the year 1931 furnished to the Surgeon-General by Dr. F. G. Rose, B.A., M.B., B. Chir. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), M.D., D.M.R. & E. (Camb.), Medical Superintendent, Leprosy Hospital:—

“*Ordinances, Regulations, &c.*—During the year Ordinance No. 14 of 1931 to make better provision for the treatment, care and isolation of persons suffering from leprosy was passed.”

“By this Ordinance admission to the Leprosy Hospital has been simplified and the magistrate and police eliminated as part of the legal procedure. Since its passage nearly all the notified cases have been voluntarily admitted; if they are unable to afford the means of transport, their passages are paid by Government from Poor Law Funds. Closed cases are not now compulsorily isolated, though the majority seek admission and are treated for a certain period before becoming outpatients. A Leprosy Board has been appointed which confirms the diagnosis of Leprosy in new admissions, recommends the discharge of arrested or quiescent cases, and also generally acts in an advisory capacity to the Surgeon-General.

“The Ordinance also provides for the compulsory removal of newborn children from their parents, if one or both of the parents suffer from leprosy. Other provisions include compulsory notification and the appointment of a Board of Official Visitors and of a Visiting Justice. From the grant of £500 made in December, 1930, by the British Empire Leprosy Relief Association to the Government of this Colony for the purpose of establishing clinic centres in appropriate localities and extending the policy of periodic leprosy surveys and propaganda, a clinic

“centre was established at Lodge Village at the end of the year and a
 “further centre is to be established in the Canje District adjoining New
 “Amsterdam. With the out-patient station at the Leprosy Hospital
 “itself, there will be therefore three centres at which closed cases may
 “attend as out-patients and discharged cases for examination and further
 “treatment.

“Special attention is also paid at these centres to examinations of the
 “families of infected persons, a measure on which so much stress is laid
 “by Sir Leonard Rogers.

“*Buildings.*—I regret to have to report that all the buildings except
 “the Male Hospital and Infirmary are in a grave condition of disrepair
 “most of the roofs are leaking, many window panes are missing and the
 “flooring of some of the buildings is so precarious as to be dangerous to
 “life and limb.

“Minor repairs are constantly being done by the attendant and
 “inmate carpenters, but, owing to lack of material, no major repairs are
 “possible.

“Two main bridges collapsed during the year, one being repaired by
 “inmate labour with material supplied by the Public Works Department,
 “while the other still remains incapable of carrying heavy traffic.

“*Grounds.*—The grounds have been kept in good condition, but it has
 “been impossible to keep the roads in repair for lack of material.

“The Cricket and Football grounds and Tennis lawns have been well
 “kept up. Most of the *Hydnocarpus* trees are doing well and a few
 “fruited during the year.

“The Government Ecologist, Mr. Follet-Smith, visited during the
 “year and gave useful advice with regard to their culture.

“The farm is still being kept up but the lack of water is a serious
 “handicap and only limited crops are possible under the circumstances.

“*Sanitation.*—The latrines and outhouses are in a most dilapidated
 “condition and many are quite useless on that account.

“More latrines are also urgently needed; it is impossible to
 “exaggerate the necessity for efficient disposal of excreta in such an
 “institution as this.

“*Occupation.*—The usual avocations of carpenter, shoemaker and
 “tailor have been followed, and all the minor repairs, making of shoes,
 “boots, etc. and of clothing have been done by the patients under the
 “supervision of Artisan Attendants.

“Many patients also have engaged in farming, poultry-rearing and
 “the rearing of pigs, besides trench-digging, weeding and other forms of
 “unskilled labour.

“A large quantity of greens and other vegetables, and all the eggs
 “and chickens used are thus supplied.

“Patients have also been trained to give the daily injections and
 “local applications and to administer treatment in the Electro-therapeutic
 “Department.

“There are also a few shopkeepers among them and all except those
 “absolutely incapacitated do their share of work.

“*Sports and Pastimes.*—Cricket and Football have been played as
 “usual and the usual dances and entertainments have been organized, and
 “the weekly Cinema has, as usual, been thoroughly appreciated.

“During the year a Guide-Troop and Scout-Troop were formed.
 “The Guide-troop was started on the initiative of Mrs. S. H. Bayley,
 “Colony Commissioner, and is under the direct control of Mrs. F. G. Rose
 “to whose devotion the success and expansion of the movement in the
 “Leprosy Hospital have been largely due.

“The existence of these Guides and Brownies has made a remarkable
 “difference to the tone of the whole institution and adds a new zest to a life

“dreary and monotonous at the best. Great kindness, both by way of visits and of welcome gifts, has been shown to the Troops by Lady Denham, the wife of His Excellency the Governor, Mrs. S. H. Bayley, Colony Commissioner, Mrs. G. R. Reid, Divisional Commissioner, and many other ladies in the capital too numerous to mention.

“The Scouts have the advantage of a keen and well instructed Scout-master among the patients and are also undergoing training with unflagging enthusiasm.

“The Guides have been provided with a Club-room and a tennis lawn and Scouts pavilion are now in course of construction.

“*Treatment (a) Specific.*—For specific treatment reliance has continued to be placed on Alepol intravenously and Hydnocarpus Oil intramuscularly, varied occasionally by Esters of Hydnocarpus intramuscularly and intradermally.

“The same local treatment has been used, viz., application of Trichloroacetic Acid varied by applications of Carbonic Snow.

“One visit was paid by the Government Ophthalmologist, who performed one operation for cataract and prescribed treatment for several other cases.

“*Electro-Therapeutic Department.*—1,465 sessions were given to 67 male and female patients. Faradic, galvanic and high-frequency currents and ultra-violet rays radiations were used.

“*Laboratory Investigations.*—28 examinations of sputa for B. Tuberculosis, 18 examinations of stools for *Ancylostome ova* or *amœbæ*, 9 examinations of blood for malarial parasites, 57 Khan precipitation tests, and 877 smears from Nasal mucosa, nodules, etc., for M. Lepree, were made during the year.

“*Results of treatment, discharges, re-admissions, relapses*—

“During the year 193 patients were under active treatment.

“The following table shows the results :—

TABLE I.

	No.	Percentage.
Treated	193	...
Improved	142	73.6
Stationary	42	21.8
Worse	9	4.7
Positive Cases	122	...
Positive cases becoming negative during the year	35	28.7

“60 cases were discharged as negative during the year or 31.1% of those under active treatment. One arrested case of cutaneous leprosy discharged in 1929 relapsed during the year and one quiescent case suffered interruption. Both were immediately re-admitted and again became negative after a comparatively short course of treatment.

“Of over 200 persons discharged during the past 5 years, only 2 have eluded observation.

“During 1931 over 68% of those discharged were without deformity.

“The following table shows the progress of the persons discharged :—

TABLE II.

Year.	Discharged.	Died.	Relapsed.	Remained Leprosy Hospital but have not relapsed.
1926	1	1	...	...
1927	25	5	3	1
1928	30	4	5	10
1929	46	3	6	6
1930	28	...	...	3
1931	60	...	...	2
Total	190	13	14	22

“ *Deaths.*—Post mortem examinations were carried out on 3 of the 27 persons who died, the causes of death being Nephritis, Pulmonary Tuberculosis and Acute Dysentery.

“ In two cases death was due to active Leprosy.”

72. The statistical returns of the Leprosy Hospital for the year are as follows :—

(1.) TABLE SHOWING NUMBER OF PATIENTS TREATED AND PERCENTAGE MORTALITY, 1931.

	M.	F.	T.
Number of patients on 31st December, 1930	164	107	271
New admissions, 1931	33	24	57
Re-admitted once in 1931	26	18	44
Re-admitted twice in 1931	7	...	7
Re-admitted thrice in 1931	3	...	3
Re-admitted four times	1	...	1
Total number treated in Leprosy Hospital, 1931	234	149	383
Died in Leprosy Hospital, 1931	15	12	27
Percentage mortality, 1931	6.4	8.1	7.0
Daily average number treated, 1931	138.0	101.7	260.7

(2) -NO. OF ADMISSIONS, DISCHARGES, DEATHS, ETC., CLASSIFIED ACCORDING TO RACE.

	EUROPEANS.				EAST INDIANS.				Chinese.		Aboriginal Indians.		Black.		Mixed Races.		Total.		Grand Total.
	Other than Portuguese.		Portuguese.		East Indian Immigrants.		B. G. East Indians.		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
	M.	F.	M.	F.	M.	F.	M.	F.											
No. of patients on 31st December, 1930	1	...	7	6	33	9	22	14	4	2	...	...	...	67	33	30	23	164	271
New admissions, 1931	2	...	2	...	10	5	6	1	...	2	...	...	...	11	13	2	2	33	57
Re-admitted once in 1931	...	...	...	1	5	3	7	4	...	...	...	...	...	13	8	1	2	26	44
Re-admitted twice in 1931	...	...	...	...	2	...	5	...	...	...	...	...	...	...	...	...	...	7	7
Re-admitted thrice in 1931	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	3	3
Re-admitted 4 times in 1931	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1
Discharged once in 1931	1	...	...	2	9	5	11	7	2	1	...	...	...	18	15	6	4	47	81
Discharged twice in 1931	...	...	...	...	1	...	5	1	...	...	...	...	...	1	...	...	...	7	8
Discharged thrice in 1931	...	...	...	...	...	...	3	...	...	...	...	...	...	2	...	...	...	5	5
Absconded in 1931	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1
Transferred in 1931	...	...	...	1	7	4	2	...	...	...	...	...	...	...	...	...	...	1	1
Died in 1931	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	27
Remaining on 31st December, 1931	2	...	9	4	33	8	29	11	2	3	...	...	...	66	54	26	20	138	259

383 admitted.

(died.
124 Discharged &

3.) CLASSIFICATION OF PATIENTS ACCORDING TO DISTRICT, FORM OF LEPROSY AND OCCUPATION.

County of Demerara.	M.	F.	T.	County of Berbice.	M.	F.	T.	County of Essequibo.	M.	F.	T.	Form of Leprosy.	M.	F.	T.
Georgetown	73	36	109	New Amsterdam	4	4	8	North Essequibo	2	3	5	Cutaneous	77	50	127
East Coast	15	23	38	East Coast	17	10	27	Pomeroon River	2	...	2	Neural	72	44	116
West Coast	7	4	11	West Coast	4	2	6	South Essequibo	3	4	7	Mixed	10	6	16
East Bank	6	4	10	East Bank	3	1	4	North West District	1	2	3	Non Leper	...	...	...
West Bank	8	2	10	West Bank	1	...	1								
Demerara River	5	1	6	Canje	6	3	9								
				Berbice River	2	1	3								
Total	114	70	184	Total	37	21	58	Total	8	9	17	Total	159	100	259

Occupation.	M.	F.	T.
Labourer	86	33	119
Farmer	5	1	6
Scholars	27	13	40
Tailors	2	...	2
Chauffeur	2	...	2
Vagrants	6	...	6
Carpenter	3	...	3
Mechanic	1	...	1
Clerk	1	...	1
Schoolmaster	1	...	1
Shoemaker	2	...	2
Salesman	3	1	4
Washer	...	1	1
Seamstress	...	6	6
Housewife	...	11	11
Clerkess	...	1	1
Domestic Servants	...	18	18
Unemployed	29	15	35
Total	159	100	259

(4.) CLASSIFICATION OF PATIENTS ACCORDING TO AGE, RACE AND SEX.

	Other than Portuguese.		Portuguese.		E. I. I.		B. G. E. I.		Chinese.		Ab. Indians.		Blacks.		Mixed.		Total.		Grand Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Ages 1 to 5 years..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" 6 .. 10	1	1	1	3	4
" 11 .. 20 ..	1	...	2	...	...	...	1	...	...	2	...	...	14	11	4	...	22	16	38
" 21 .. 30 ..	...	...	4	1	...	...	2	5	1	...	...	22	13	12	...	...	41	27	68
" 31 .. 40	1	1	12	4	1	13	14	6	4	36	23	59
" 41 .. 50 ..	1	...	1	...	28	5	2	...	...	...	...	11	8	...	...	2	43	15	58
" 51 .. 60 ..	...	...	2	5	3	1	...	...	...	...	...	4	7	3	...	...	13	12	25
" 61 .. 70 ..	...	...	1	...	...	...	...	...	1	...	...	2	1	...	...	2	3	4	7
Total	3	...	9	4	75	8	19	10	2	3	...	1	66	54	25	29	159	100	259	

D.—Helminthic Diseases.

Ancylostomiasis.

73. 133 cases were treated in public hospitals with 8 deaths, as compared with 171 cases, with 21 deaths in 1930.

74. 415 cases were treated in Out-patient Departments as against 270* cases in 1930.

75. The deaths registered as due to the same disease throughout the whole Colony were 14 as against 28 in 1930.

E.—Special Diseases.

(i) *Puerperal State.*—

76. 348 cases were treated in public hospitals with 48 deaths, as compared with 420 cases with 39 deaths in 1930.

77. The number of normal confinements in public hospitals was 1,027, including 28 remaining from the previous year, as against 1,107 in 1930.

*Includes cases attending on more than one occasion, i.e., repeat cases.

(ii) *Cancer and other Malignant Tumours.*—

78. The number of new cases treated in public hospitals was 95 as against 101 in 1930.

79. The following Table gives the different forms of malignant growths together with the racial incidence in each :—

Race.	Carcinoma.		Sarcoma.		Epithelioma.		Rodent Ulcer.		Endothelioma.		Unclassified.		Total.	
	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931
	European (other than Portuguese)	1	1	2	1	3
European (Portuguese)	4	4	1	1	...	...	...	1	...	...	...	1	6	6
East Indian	15	12	...	1	1	1	...	...	...	...	1	1	17	15
African	59	49	3	6	2	1	...	...	1	...	...	1	85	57
Mixed	7	10	1	1	1	...	1	1	...	...	...	1	10	13
Chinese	1	1	...	...	...	...	...	...	...	...	...	...	1	1
Syrian	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Total	88	77	5	9	4	3	1	4	1	...	2	3	101	95

80. Below is furnished a return of malignant tumours treated at Mackenzie Hospital during the year 1931 :—

TABLE NO. 1.—DIVISION OF CASES ACCORDING TO RACE.

Race.	Total.
Black	4
East Indians	3
Portuguese	1
Mixed	5
Chinese	0
Aboriginal Indians	0
White	1
Total	14

TABLE NO. 2.—DIVISION OF CASES ACCORDING TO SEX.

Sex.	Black.	East Indian.	Portuguese.	Mixed.	White.	Total.
Male	0	1	1	1	0	3
Female	4	2	0	4	1	11

TABLE NO. 3.—AGE INCIDENCE.

Age.	Black.	East Indian.	Portuguese.	Mixed.	White.	Total.
0-29	...	...	...	...	...	...
30-39	2	1	6	0	0	3
40-49	3	1	0	0	0	4
50-59	0	0	0	4	1	5
60 and over	0	0	1	1	0	2
Total	5	2	1	5	1	14

F.—Quarantinable Diseases.

81. There were no cases of Plague, Cholera, Yellow Fever, Small-pox or Typhus during the year.

III.—VITAL STATISTICS.

82. During the year 1931 a Census of the population of the Colony was made when it was calculated that the total population on the 26th April numbered 310,933 (males 155,381, females 155,552). The estimated population based on the Census figures on the 31st December, 1931, was 313,619.

83. There were 9,853 births and 6,848 deaths as compared with 10,438 births and 7,174 deaths in 1930.

84. The natural increase of population estimated in terms of births and deaths has been well maintained, the births exceeding the deaths by 3,005. Below is a statement indicating increase and decrease of population over the decennial period 1922-1931 :—

Year.	Excess.	
	Births.	Deaths.
1922	...	389
1923	641	...
1924	2,038	...
1925	2,845	...
1926	2,816	...
1927	2,017	...
1928	127	...
1929	2,543	...
1930	3,264	...
1931	3,005	...

85. Immigration exceeded emigration by 269.

86. The following Table shows Emigration and Immigration for the past ten years, together with excess for each year :—

Year.	Immigrants.	Emigrants.	Excess.	
			Immigrants.	Emigrants.
1922	9,069	8,991	18	...
1923	9,460	8,719	741	...
1924	9,338	9,391	...	33
1925	10,014	9,651	363	...
1926	9,694	10,078	...	384
1927	9,919	10,307	...	388
1928	11,172	11,988	...	816
1929	10,621	11,272	...	651
1930	10,076	10,527	...	451
1931	8,670	8,401	269	...
			1,391	2,723

87. The net excess of Emigration over Immigration during the last decade has thus been reduced from 1,975 in 1930 to 1,332 in 1931.

88. The birth-rate per thousand of the population was 31.4 as compared with 33.4 in 1930.

89. The death-rate was 21.8 per thousand as compared with 23.0 in 1930.

90. The infant mortality was 139 per thousand registered births as compared with 146 in 1930.

91. Notified still-births numbered 621 as against 697 in 1930.

92. The maternal mortality statistics for the year was as follows :—

- (i) The whole Colony—14.8 per 1,000 live births.
- (ii) Public Hospitals — 4.7 per 1,000 live births.
- (iii) Infant Welfare and Maternity League— 7.8 per 1,000 live births.
- (iv) Sugar Estates — 5.7 per 1,000 live births.

City of Georgetown.

93. Below is given a Table showing in parallel columns the separate figures for the Municipal area and for the Georgetown Registration District which differs from the former in that it includes certain districts outside the municipal boundaries:—

	City of Georgetown.	
	Municipal Area.	Registration Area.*
Estimated Population	61,961	62,690
No. of Births	1,533	1,726
Birth-rate	24.7	27.5
No of Deaths	1,147	1,190
Death-rate	18.5	19.0
Infantile Mortality	129	123
Deaths from Enteric Fever	5	5
Deaths from Malaria	60	65

*The deaths of persons in the Hospitals and other Public Institutions in Georgetown have in each case been returned as occurring in the district from which the patients came.

Town of New Amsterdam.

94. The number of births registered was 239 or a rate of 26.9 per thousand as compared with 300 or a rate of 33.0 per thousand in 1930.

95. There were 202 deaths or a rate of 22.7 per thousand as compared with 199 deaths or a rate of 21.9 per thousand in 1930.

96. The infant mortality was 138 per thousand registered births as compared with 153 per thousand in 1930.

97. Malaria Fever was the cause of 11 deaths as compared with 33 in 1930.

98. The number of cases of Enteric Fever notified was 7 as against 22 in 1930, and there were three deaths as against 7 in 1930.

99. The following Tables give the vital statistics for each registration district in the Colony including Georgetown and New Amsterdam for the years 1931, 1930 and 1929 :—

RETURN OF VITAL STATISTICS FOR EACH REGISTRATION DISTRICT IN THE COLONY FOR THE YEARS 1931, 1930, 1929.

DISTRICT.	Estimated Population.	Births.	Deaths.	Annual rate per 1,000 living.		Enteric Fever.	Intestinal Disorders over one year.	All Renal Diseases.	All Respiratory Diseases.	Malarial Fever.	Phthisis and other forms of Tuberculosis.	Intestinal Disorders under one year.	Still-Births.	No. of deaths of children under one year of age.	Deaths of children under one year of age to 1,000 registered births.
				Births.	Deaths.										
Skeldon	13,110	511	226	39.0	17.2	19	10	47	19	1	8	23	54	166	
Port Mourant	22,202	844	384	38.0	17.3	23	24	51	31	12	17	25	94	111	
Lower Canje	10,238	257	240	25.1	23.4	5	17	17	63	24	3	6	50	195	
Upper Canje	701	20	26	28.5	37.1	3	3	1	5	3	6	7	50	195	
New Amsterdam	8,889	239	202	26.9	22.7	24	21	11	14	6	33	33	158	158	
Highbury	2,883	81	117	28.1	40.6	11	12	17	15	6	2	5	16	198	
Mara and Upper Berbice River	2,731	65	90	23.6	32.7	7	7	18	9	...	...	1	10	154
Cotton Tree	16,083	434	286	27.0	17.8	31	17	65	20	11	6	6	26	48	
Mahaicony	7,003	330	158	47.1	22.6	9	9	8	31	3	4	21	48	145	
Mahaica	12,743	440	315	34.5	24.7	3	17	22	51	43	6	10	17	68	
Buxton	21,149	605	478	28.6	22.6	9	37	27	66	59	26	13	49	99	
Plaisance	22,458	703	591	31.3	26.3	6	53	39	82	59	22	25	35	123	
Georgetown	62,690	1,726	1,190	27.5	19.0	5	54	73	137	65	88	20	159	213	
Peter's Hall	18,998	525	494	27.6	26.0	3	27	44	77	67	19	9	31	87	
Demerara River	7,965	204	208	25.6	26.1	1	5	13	24	59	5	...	11	37	
Belle Vue	14,170	450	377	31.8	26.7	3	14	42	45	36	27	5	30	73	
Leonora	12,382	469	223	37.9	18.0	2	9	14	26	22	7	12	34	44	
Philadelphia-Leguan	13,994	525	296	37.5	21.2	1	20	25	49	39	4	14	37	67	
Up. Essequibo River	1,299	1	11	8	8.5	...	4	...	...	1	...	...	...	72
Bartica	4,567	97	97	21.2	21.2	1	4	9	16	19	9	1	9	7	
Up. Mazaruni River	2,228	1	53	4	23.1	...	6	...	11	12	...	...	...	...
Wakenaam	4,125	149	74	36.1	17.9	...	3	9	4	5	3	2	6	167	
Suddie	7,813	352	298	45.1	26.6	...	4	27	15	32	6	4	27	53	
Anna Regina	10,996	375	216	34.1	19.6	...	13	27	22	39	4	13	17	60	
Pomeroon	5,181	222	88	42.8	17.0	...	1	5	6	17	4	...	4	32	
North Western	6,909	228	200	33.0	28.9	...	2	5	20	95	4	...	14	44	
Males	156,779	4,994	3,599	31.9	23.0	22	223	247	574	435	168	106	338	737	
Females	156,840	4,859	3,249	31.0	20.7	30	194	244	368	399	119	71	283	636	
Persons	313,619	9,853	6,848	31.4	21.8	53	417	491	942	834	287	177	621	1373	
For year 1930	312,489	10,438	7,174	33.4	23.0	53	388	535	944	1104	302	162	697	1529	
For year 1929	309,676	9,824	7,281	31.7	23.5	44	462	525	1032	1198	276	192	703	1434	

RETURN OF VITAL STATISTICS FOR GEORGETOWN AND NEW AMSTERDAM FOR THE YEARS 1931, 1930, 1929.

DISTRICT.	Estimated Population.	Births.	Deaths.	Annual rate per 1,000 living.		Enteric Fever.	Intestinal Disorders over 1 year.	All Renal Diseases.	All Respiratory Diseases.	Malarial Fever.	Phthisis & other forms of Tuberculosis.	Intestinal Disorders under 1 year.	Still-Births.	No. of deaths of children under 1 year of age.	Deaths of children under one year of age to 1,000 registered births.
				Births.	Deaths.										
Georgetown, 1931	62,690	1726	1190	27.5	19.0	5	54	73	137	65	88	20	159	213	
Georgetown, 1930	57,921	1856	1319	32.0	22.8	7	79	77	149	88	94	23	173	213	
Georgetown, 1929	57,560	1874	1427	32.6	24.8	11	77	101	169	103	66	54	177	293	
New Amsterdam, 1931	8,889	239	202	26.9	22.7	3	24	8	21	11	14	6	33	33	
New Amsterdam, 1930	9,081	300	199	33.0	21.9	7	9	10	19	33	9	3	24	46	
New Amsterdam, 1929	8,958	301	181	33.6	20.2	...	13	12	16	25	17	4	30	103	

NOTE.—The deaths of persons in the Hospitals and other Public Institutions have in each case been returned as occurring in the District from which the patients came.

IV.—HOSPITALS AND DISPENSARIES.

100. During the year a new Casualty and Admitting Department was erected at the Public Hospital, Georgetown, on the site of the old building which was demolished. The new building houses in addition a commodious hospital dispensary and a large storeroom for drugs, medical and surgical appliances. A further improvement has been the provision on the floor immediately above the Casualty Department of well-arranged accommodation for the Orderly Officers on night duty.

101. During the same year on the female side of the hospital the old Nurses' Recreation Room was converted into an Outpatient Department which includes in it Ophthalmic and Dental Departments.

102. The public hospitals in the Colony are:—

	Public Hospital.	County.	No. of beds.
1	Georgetown ...	Demerara	564
2	New Amsterdam ...	Berbice	161
3	Suddie ...	Essequibo	92
4	Bartica ...	do.	14
5	Mabaruma ...	do.	30
6	Potaro* ...	do.	6
7	Kamakusa* ...	do.	8

*Dispensary Hospitals in interior mining localities.

103. Table 2 shows the accommodation, number of patients and deaths, average stay, percentage of mortality on number treated and number of out-patients in each hospital.

104. Table 3 gives the classes of in-patients and out-patients treated and the number of prescriptions dispensed.

105. Table 4 gives in detail the diseases of out-patients and in-patients treated.

106. Table 5 is a return of the surgical operations performed.

107. The number of in-patients treated was 18,276 as compared with 19,657 in 1930.

108. The Table below is an attempt to arrive at the actual number of new admissions to hospitals during the year and furnishes approximate figures of admissions of the same patients on one or more occasions. The total thus furnishes in truer perspective the actual amount of sickness occurring in the Colony and treated at the Public Hospitals:—

IN-PATIENTS.

Hospital.	Total admissions during year.	Persons admitted on one occasion (approx.)	Persons admitted on 2 occasions.	Persons admitted on more than 2 occasions (approx.)
Public Hospital, Georgetown ...	11,179	7,958	1,126	323
Public Hospital, Berbice ...	3,115	2,747	133	34
Public Hospital, Suddie ...	2,068	1,868	67	22
Public Hospital, Bartica ...	498	450	12	8
Public Hospital, Mabaruma ...	576	509	27	4
Public Hospital, Kamakusa ...	104	101	1	...
Public Hospital, Potaro ...	16	14	1	...
	17,556	13,647	1,367	391

Approximately 13,647 persons admitted on one occasion.
Approximately 15,465 persons admitted for the year.

109. There were 95,805 out-patient attendances in 1931 as against 93,332 in 1930. Of the attendances in 1931, 29,168 were for repeat medicines only, leaving a total of 66,637 persons treated as out-patients during the year.

110. The daily average number of patients in the three principal hospitals was :—

	1929	1930.	1931.
Public Hospital, Georgetown ...	496	544	487
Public Hospital, New Amsterdam...	111	119	137
Public Hospital, Suddie ...	65	80	74

111. The cost per caput per diem of patients treated, exclusive of Medical Officers' salaries, was :—

	1929. Cents.	1930. Cents.	1931. Cents.
Public Hospital, Georgetown ...	83.3	71.2	77.6
Public Hospital, New Amsterdam...	90.7	88.85	75.9
Public Hospital, Suddie ...	89.7	79.2	77.1
Public Hospital, Bartica ...	114.	145.7	107.5
Public Hospital, Mabaruma ...	99.7	89.07	83.7

112. During the year 106 nurses and midwives were trained. The following Table shows the number who qualified by examination :—

Hospital.	Probationers.	Nurses.	Midwives.	Total.
Georgetown ...	43	13	18	74
New Amsterdam ...	4	5	5	14
Suddie ...	...	1	2	3
	47	19	25	91

OPHTHALMIC DEPARTMENT.

Accommodation.

113. During the year this Department was moved from the building on the male side of the Hospital to the new Out-patient Department facing Middle Street.

114. The Staff consists of :—

Government Ophthalmologist.
Two nurses.
Clerk.

115. Owing to the absence from the Colony of the Government Ophthalmologist on six months' vacation leave only one visit was paid to the Public Hospital at New Amsterdam and for the same reason the statistics relating to this Department show considerable decrease in the number of cases treated, operations performed and in revenue.

116. The total number of cases treated during the year was 1,873 as against 4,108 for the previous year, made up as follows :—

Public Hospital.	IN-PATIENTS.						OUT-PATIENTS.					
	Paying.			Pauper.			Paying.			Pauper.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Georgetown ...	8	6	14	65	112	177	357	380	737	394	367	761
New Amsterdam ...	2	...	2	8	1	9	90	39	129	29	24	44
Suddie ...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	10	6	16	73	113	186	447	419	866	414	391	805

117. The following surgical operations were performed:—

	Public Hospital, Georgetown.	Public Hospital, New Amsterdam.	Public Hospital, Suddie.
Senile Cataract	44	...	...
Traumatic Cataract	1	...	...
After Cataract	1	...	...
Pterygium	6	2	...
Prolapse of Iris	6	...	...
Chronic Iritis	1	...	...
Chronic Glaucoma	8	...	...
Foreign body of Cornea	...	1	...
Cauterisation of Corneal Ulcer	...	3	...
Panophthalmitis	1	...	...
Lachrymal sac	...	1	...
Papilloma of Conjunctiva	1	...	...
Subconjunctival injections	...	3	...
Phthisis bulbi	1	...	...
Leucoma adhaerens	2	...	...
Dacryocystitis	1	...	...
Occlusio Pupillae	1	...	...
Tarsal Cyst	12	5	...
Foreign body	10	...	...
Total	96	15	...

118. The number of cases refracted and prescribed glasses was 121.

119. The revenue derived from all sources was \$615.99 as compared with \$1,697.20 in 1930 and was made up as follows:—

	In-Patients.	Out-Patients.	Surgical Operations.	Total.
Public Hospital, Georgetown	\$ 136 29	\$ 330 30	\$ 58 40	\$ 524 99
Public Hospital, New Amsterdam	6 00	83 00	...	91 00
Public Hospital, Suddie	...	...	...	...
Total	\$ 142 29	\$ 415 30	\$ 58 40	\$ 615 99

DENTAL DEPARTMENT.

120. This Department was transferred to the new Out-Patient Department which was opened during the year and considerable improvement has been effected thereby. The waiting and consulting rooms are well designed and equipped from the point of view of the Dental Surgeon and the public.

121. The staff consists of:—
Dental Surgeon.
Clerk.
Assistant Nurse.

122. The number of out-patients treated was 6,071 as compared with 5,865 in 1930, consisting of 2,538 pauper cases (1,077 males, 1,461 females) and 3,533 poverty cases (1,664 males, 1,869 females).

123. The revenue collected amounted to \$493.68 as compared with \$611.60 for the previous year.

X-RAY AND ELECTRICAL DEPARTMENT.

Public Hospital, Georgetown.

124. The staff of the Department attached to the Public Hospital, Georgetown, consists of:—

Government Radiographer.
Assistant Government Radiographer.
Two nurses.

125. *Radiographic.*—2,031 cases were radiographed during the year; of these 200 were sent by private practitioners and Government Medical Officers in districts and 1,831 from the Public Hospital, Georgetown.

126. The following shows the nature of the examinations:—

Barium Meals	...	...	134
Enemas	...	...	14
Chests	...	...	135
Teeth	...	...	25
Urinary Tract	...	...	38
Gall Bladder	...	...	116
Miscellaneous	...	...	1,569
			<hr/>
			2,031
			<hr/>

127. *X-Ray Treatment*.—37 patients were treated by X-Rays and 114 exposures made—of these 18 were sent by private practitioners and Government Medical Officers in districts and 19 were from the Public Hospital, Georgetown.

128. *Electrical Treatment*.—293 cases were treated and 5,456 attendances were recorded.

129. The revenue for the year was \$1,305.81 as against \$1,222.51 for 1930.

Public Hospital, New Amsterdam.

130. *Radiographic*.—The following gives the nature of the examinations:—

Barium Meals	...	...	4
Barium Enemas	...	...	...
Chests	...	...	16
Screening	...	...	...
Urinary Tract	...	...	...
Gall Bladder	...	...	1
Dental Films	...	...	2
Miscellaneous	...	...	92
			<hr/>
			115
			<hr/>

131. No cases were treated by X-Rays.

132. The revenue collected was \$62 as against \$53 for 1930.

TABLE 2
PUBLIC HOSPITALS.

	Georgetown.			New Amsterdam.			Suddie.			Bartica.			North-Western District.			Kamakusa.			Potaro.		
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
	Accommodation ... in Hospital—1st January, 1931 ...	317	247	564	92	69	161	45	47	92	10	4	14	15	15	30	8	8	16	6	6	12
Patients remaining in Hospital—1st January, 1931 ...	336	176	512	68	46	114	35	23	58	9	1	10	14	7	21	5	5	10	5	5	10
Patients admitted during the year ...	6,302	4,577	11,179	1,879	1,236	3,115	1,122	946	2,068	367	131	498	325	251	576	104	104	208	15	15	30
Total ...	6,638	5,023	11,661	1,947	1,282	3,229	1,157	969	2,126	376	132	508	339	258	597	109	109	218	15	15	30
Patients discharged—cured ...	880	1,084	1,964	87	63	150	57	57	114	6	6	12	18	18	36	9	9	18	3	3	6
" " relieved ...	4,314	2,836	7,150	1,488	942	2,430	876	682	1,558	288	88	376	242	192	434	61	61	122	3	3	6
" " not relieved ...	427	479	906	129	83	212	68	69	137	72	15	87	7	12	19	9	9	18	2	2	4
" " not sick ...	85	71	156	20	23	43	26	24	50	...	5	6	11	6	17	...	...	...	...	...	...
" " died ...	611	426	1,037	167	144	311	96	74	170	23	17	40	39	12	51	17	17	34	...	...	...
Patients remaining in Hospital—31st December, 1931 ...	321	198	519	65	53	118	34	23	57	7	7	14	8	8	16	...	...	...	1	1	2
Total Patients treated ...	6,638	5,023	11,661	1,947	1,282	3,229	1,157	969	2,126	376	132	508	339	258	597	109	109	218	15	15	30
The daily average number in Hospital during the year 1931 ...	298	188	487	80.8	49.8	130.7	41.9	32.2	74.1	7.70	3.17	10.87	13.9	7.5	21.4	1.5	1.5	3.0	1.5	1.5	3.0
Average stay in days of Patients discharged ...	16	12	14	16.7	14.8	15.8	12.5	12.9	12.7	6.66	7.61	6.90	13.4	10.7	11.1	5.5	5.5	11.0	5.5	5.5	11.0
Average stay in days of Patients remaining on 31st December, 1931 ...	49	30	40	26.2	20.7	23.4	19.8	17.2	18.5	10.28	4.71	7.5	16.6	11.3	14.2	4.6	4.6	9.2	4.6	4.6	9.2
Average stay in days of Patients died ...	20	15	18	14.8	11.2	13.1	7.5	5.8	6.6	6.43	3.17	5.05	9.7	5.7	8.8	4.6	4.6	9.2	4.6	4.6	9.2
Percentage of Mortality on number treated ...	9.2	8.4	8.8	8.57	11.23	9.63	8.3	7.6	8.0	6.11	12.87	7.87	11.5	4.6	8.5	13.6	13.6	27.2	13.6	13.6	27.2
Number of Out-Patients (exclusive of attendances for repeat medicines) ...	15,397	14,586	29,983	8,941	10,892	19,743	3,281	3,908	7,189	1,676	1,738	3,414	2,568	2,245	4,813	1,105	1,125	2,230	1,125	1,125	2,250

TABLE 3.

In-Patients Department, Public Hospitals, from 1st January to 31st December, 1931.

Class of Patients Treated.	Georgetown.	New Amsterdam.	Suddie.	Bartica.	North-Western District.	Kamakusa.	Potaro.
Seamen	33	...	...	...	...	...	...
Pay Patients	1,239	335	148	34	68	10	14
Police-men	227	48	7	1	1	1	...
<i>Race:</i>							
Europeans (other than Portuguese) ...	205	26	4	6	11	6	2
Europeans (Portuguese)	474	22	20	7	10	...	...
Mixed	1,098	222	188	136	187	10	1
Blacks	6,073	1,369	486	253	61	85	13
East Indians	3,148	1,559	1,369	66	136	4	...
Chinese	196	19	4	1	2	1	...
Aboriginal Indians	75	12	64	39	190	3	...
Total	11,179*	3,229	2,126	508	597	109	16

*Exclusive of 512 patients remaining in hospital on 31st December, 1930.

OUT-PATIENT DEPARTMENT.—PUBLIC HOSPITALS.

	Georgetown.	New Amsterdam.	Suddie.	Bartica.	North Western District.	Kamakusa.	Potaro.
Number of Out-Patients attended to with Pauper Certificates	15,149	7,985	6,060	2,910	4,511	...	...
Number of Out-Patients attended to with Poverty Certificates	11,221	10,562	959	376	211	...	...
Number of Out-Patients and casualties without Certificates	3,613	1,196	13	128	91	1,125	370
Number of Out-Patients treated during the year ...	29,983	19,743	7,189	3,414	4,813	1,125	370
Number of Government Employees attended to as Out-Patients	3,389	441	157	18	61	38	30
Number of Prescriptions dispensed for In-Patients	77,735	25,046	3,028	1,024	4,204	144	36
Number of Prescriptions dispensed for Out-Patients	36,758	27,890	10,032	4,514	5,574	2,855	400

TABLE 4.
HOSPITALS—GEORGETOWN, NEW AMSTERDAM, SUDDIE, BARTICA, NORTH-WESTERN DISTRICT, KAMAKUSA AND POTARO.
Return of Diseases (Out-Patients) and of Deaths (In-Patients) for the year 1931.

DISEASES.	P.H., Georgetown.			P.H., New Amsterdam.			P.H., Suddie.			P.H., Bartica.			P.H., N.W.D.			P.H., Kamakusa.			P.H., Potaro.			Totals.																															
	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.	In-Patients.																														
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	Cases.	Deaths																													
I.—Epidemic, Endemic, and Infectious Diseases.																																																					
1. Enteric Group—	2	1	71	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...									
(a) Typhoid Fever																													
(b) Paratyphoid A																													
(c) Paratyphoid B																													
(d) Paratyphoid C																													
(e) Type not defined																													
2. Typhus																													
3. Relapsing Fever																													
4. Unrelentant Fever																													
5. Malaria—	13	6	75	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...									
(a) Benign Tertian																													
(b) Quartan																													
(c) Sub-Tertian																													
(d) Chronic Malaria	82	162	245	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...									
(e) Blackwater	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...							
(f) Unclassified	1,658	1,970	700	15	1,122	1,338	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...												
6. Small Pox—																													
(a) Alastrim																													
7. Measles																													
8. Scarlet Fever																													
9. Whooping Cough	32	39	26	1	22	23	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...												
10. Diphtheria																													
11. Influenza	65	47	129	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...									
12. Miliary Fever																													
13. Mumps																													
14. Cholera																													
15. Epidemic Diarrhoea																													
16. Dysenteric Group—																													
(a) Amoebic																													
(b) Bacillary																													
(c) Unclassified	59	14	92	14	23	8	21	3	5	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...																
17. Plague																													
18. Yellow Fever																													
19. Spirochaetosis																													
20. Leptospirosis																													
(a) Nodular																													
(b) Anaesthetic																													
(c) Mixed																													
21. Erysipelas																													
22. Acute Poliomyelitis																													
23. Encephalitis Lethargica																													
Carried forward																						1,912	2,346	1,424	88	1,467	1,369	338	58	585	630	292	29	468	489	134	10	561	1,029	204	21	201	4	49	8	41	14	1	...	5,335	5,786	2,412	181

TABLE 4—(Continued).
HOSPITALS—GEORGETOWN, NEW AMSTERDAM, SUDDIE, BARTICA, NORTH-WESTERN DISTRICT, KAMAKUSA AND POTARO.
Return of Diseases (Out-Patients) and of Diseases and Deaths (In-Patients) for the year 1931.

DISEASES.	P.H., Georgetown.			P.H., New Amsterdam.			P.H., Suddie.			P.H., Bartica.			P.H., N.W.D.			P.H., Kamakusa.			P.H., Potaro.			Totals.																
	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.		In-Patients.	Out-Patients.	In-Patients.															
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	Cases.	Deaths.														
Brought forward	1,912	2,240	1,424	88	1,107	1,369	338	28	683	610	392	29	488	489	134	10	931	1,026	204	21	501	4	49	8	41	14	1	5,335	5,786	2,442	184							
24. Epidemic Cerebro Spinal Fever	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1						
25. Other Epidemic Diseases—					
(a) Rubeola (German Measles)	...	1	46	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Variola (Chicken Pox)			
(c) Dengue			
(d) Epidemic Dropsy	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(e) Yaws		
26. Glanders		
27. Anthrax		
28. Rabies		
29. Tetanus		
30. Mycosis	
31. Tuberculosis—	66	38	339	125	78	17	80	29	4	5	4	1	11	15	8	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Pulmonary and Laryngeal
(b) Tuberculosis of the Meninges or Central Nervous System
(c) Tuberculosis of the Intestines or Peritonaeum
(d) Tuberculosis of the Vertebral Column
(e) Tuberculosis of Bones and Joints
(f) Tuberculosis of other Organs—
(a) Skin or Subcutaneous Tissue (Lepus)
(b) Bones
(c) Lymphatic System
(d) Genito-Urinary
(e) Other Organs
37. Tuberculosis disseminated—
(a) Acute
(b) Chronic
38. Syphilis—	177	24	115	...	75	12	45	...	7	2	52	...	10	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Primary	62	20	48	...	15	5	21	...	6	...	40	...	11	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Secondary	696	742	700	49	292	143	41	1	22	16	20	...	16	...	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Tertiary
(d) Hereditary
(e) Period not indicated
(f) Soft Chancre
39. Carried forward	2,849	3,076	2,882	278	1,609	1,696	562	66	626	676	417	34	546	528	151	12	1,105	1,128	248	24	207	4	51	8	44	15	1	6,977	6,090	4,312	412	...	...	...	...

No.

BRITISH GUIANA.

THE GOVERNOR to THE SECRETARY OF STATE.

(Received 19th December, 1932.)

[Answered by No. .]

(No. 492.)

SIR,

Government House, British Guiana, 3rd December, 1932.

WITH reference to your despatch No. 170 of the 25th of May,* I have the honour to transmit, for your information, and to be laid before the Colonial Advisory Medical Committee, twelve copies of the Report of the Surgeon-General for the year 1931, together with twelve copies of the Report of the Public Health Department of the City of Georgetown for the same year.

2. The natural increase in the population was well maintained in the year under review, the births exceeding the deaths by 3,005.

The birth-rate per thousand of the population was 31.4 as compared with 33.4 in 1930, and the death-rate was 21.8 as against 23.0.

In Georgetown the birth-rate was 24.7 and the death-rate 18.5. These returns should be compared with those for 1926 when the birth-rate was 36.2 and the death-rate 28.0. As pointed out by the Medical Officer of Health for Georgetown in his Report, the present death-rate constitutes a record having fallen by 52 per cent. in just over twenty years. This very marked improvement in the health of Georgetown has been principally due to the valuable sewerage scheme with the introduction of a water carriage system.

3. There has been a steady decline in the incidence of malaria (including unclassified fever) since the epidemic of 1927 and 1928 when the number of deaths for the whole Colony stood at 1,715 and 1,563 respectively. The average number of deaths for the five years prior to 1927 was 1,162 as against a figure of 834 for 1931.

Pneumonia and bronchitis continue to rank high among the list of diseases causing the highest number of deaths. The average number of deaths for the decade 1922-1931, however, was 1,031, as against figures of 942 for 1931 and 944 for 1930.

4. The death-rate of infants under one year of age per thousand registered births was 139 as against 146 in 1930 and 146 in 1929. The average infantile mortality-rate for the decade 1922-1931 was 162.

Information regarding maternal mortality in the Colony has been included in the Surgeon-General's Report as requested by the Colonial Advisory Medical Committee. The figures given in paragraph 212 refer only to deaths of mothers occurring in the course of the work of the League Midwives and are in reality too small on which to base mortality-rates. There has, however, been a slight tendency to an increase during the past three years in the material mortality-rates for the Colony as a whole, the figures being 11.5, 12.7, and 14.8 for the years 1929, 1930, and 1931 respectively, the average for the past five years being 13.8. The increase in 1931 may in part be accounted for by an appreciable reduction in the number of live births as compared with the preceding year.

It is intended to include in the next Annual Report the comparative maternal mortality figures for the various races of the Colony.

5. The following figures appearing in paragraph 19 of the Report give an indication of the expenditure on medical services in recent years:—

	1929.	1930.	1931.
Total expenditure	\$621,538	\$568,895	\$547,034
Percentage of revenue of the Colony ...	10.3	11.7	12.4

6. With reference to paragraph 7 of my despatch No. 493 of the 17th of November,† the new Public Health Bill is now under consideration by a select Committee of the Legislative Council.

7. I attach copies of minutes by the acting Surgeon-General and the Government Medical Officer of Health commenting on the report of the Public Health Department of the City of Georgetown.

8. The continued steady improvement in the general health of the Colony is a matter for much satisfaction, and reflects credit on the Medical and Health Departments.

* No. C. 80405/4/31 [No. 4].

† No. C. 80405/4/31 [No. 1].

There is, however, much still to be done especially in respect of the housing and water supplies on the estates. These have, however, shown of late a considerable increase and interest in the health and sanitation amongst the labour population notably in respect of child welfare and infantile mortality with correspondingly good results.

9. I take this opportunity of bringing to your notice and that of the Colonial Advisory Medical Committee two subjects which I would suggest deserve special investigation and report in the interests of the whole of the Colonial Tropical Empire.

(1) *The Incidence and Causes of Blackwater Fever.*—Studies of the epidemiology and etiology of Blackwater fever on the Demerara river by Dr. G. Giglioli form Appendix II of the enclosed Report. It is a matter for medical experts to deal with this problem in its many bearings but writing as a layman with experience in East and West Africa and in this Colony of the incidence of this disease I venture to express the opinion that there is still much to be learnt with regard to it and in respect of its treatment.

Valuable lives have been lost here during the last few years from Blackwater. I suggest that this Colony affords an admirable field for the study of this disease from the data available, from the opportunities of considering outbreaks in connexion with climatic conditions, water supplies and tropical surroundings, &c., amongst Negroes and East Indians, Europeans and local Creoles.

I would suggest that Dr. Giglioli's studies with this note be specially considered with a view to investigation by a Commission or special experts on the subject being undertaken in this Colony when all possible facilities will be given to assist in such an inquiry.

(2) *The Use and Abuse of Quinine in the Prevention and Treatment of Malarial Fever.*—I believe that the two subjects referred to are not entirely divorced—*vide* (f) on page 88 of Dr. Giglioli's report.

From my general experience I do not share the opinion there expressed that "the population is by far better informed on the possible dangers than on the inestimable benefits which quinine can produce"—I believe that the time is come when it would be of very great help to administrative and other officers serving in the tropics that they should get further information and advice with regard to the use of quinine than that contained in the ordinary Tropical Diseases literature. The opinion of medical men, I am aware, differs in many respects, but I believe that a very considerable amount of misuse of this drug might be avoided by greater restraint being shown in advising on its universal applicability. Officers frequently arrive in the tropics after taking large doses of quinine on the passage out, others proceed to dose themselves with considerable quantities from the time of their arrival—quite irrespective of the climatic and health conditions of the spot where they are stationed. I believe that it would be found that many officers are rendered practically immune from the benefit of this drug as their systems have become impregnated with it, while in the case of others the medicine may be worse than the disease. It may not suit the particular patient who is often afraid to discontinue a treatment which has been prescribed to him as the sovereign remedy against all fevers.

In other cases officers suffer from deafness, indigestion, depression, &c., and abandon the use of a medicine which had they taken when required or in reasonable quantity might have been of the greatest service to them.

I fully appreciate that it is impossible to prescribe on paper for all and sundry but my point is that unfortunately much of the quinine campaign is so directed—a universal panacea may become as dangerous as an outbreak of disease.

I, of course, recognize that these are matters which are no doubt receiving the attention of our able School of Tropical Medicine but I submit that there is urgency in their being considered and examined fully in the field and with the assistance of the men in the Tropical Service who can speak with wide and personal experience.

I have, &c.,

EDWARD DENHAM,

Governor.

Enclosure 1 in No.

COPY OF A MINUTE BY THE ACTING SURGEON-GENERAL COMMENTING ON THE REPORT OF THE PUBLIC HEALTH DEPARTMENT FOR THE CITY OF GEORGETOWN FOR THE YEAR 1931.

H. C. S.

I BEG to submit the following remarks on the Report of the City Medical Officer of Health for 1931:—

On page 9, under the head of (1) Supervision of Midwives, a proposal has been made by me in a special minute addressed to you recommending the utilization of the services of the Superintendent of the Georgetown Maternity and Child Welfare Centre as an Inspector of Midwives; she is a fully qualified Nurse-midwife and desirous of undertaking the duties without extra remuneration. Revised regulations for the better control of midwives in the City have been made the subject of investigation by a Committee of the Medical Board and will be considered at its next meeting.

Re Ophthalmia Neonatorum—page 10. This matter has received the attention of the Committee of the Medical Board, and will be dealt with in due course.

Re milk supply—page 15. I am of the opinion that a joint Committee of the Government and Municipal Health Departments should be appointed to consider this matter, which is a very potential source of ill-health under present conditions under which the supply is obtained; there appears to be a lack of continuity of control, and this can be obviated by amending the present by-laws referred to by the City Medical Officer of Health.

Re stillbirths—page 34. The discrepancy between the number of cases notified to the City Medical Officer of Health and the number registered in the different registration districts of the City calls for notice. This anomaly will be, to some extent, obviated by the amended regulations which are under consideration by the Medical Board.

In the section dealing with *Maternity and Child Welfare*—page 39—Health Visitors and the necessity of increasing the number of these specially to strengthen the Albouystown and Charlestown Wards of the City where the need of an additional visitor has been felt, a proposal has been made by the Committee to the Mayor and Town Council to utilize the services of the Assistant to the Superintendent of the Clinic as a full-time Health Visitor.

I wish to add my quota of recognition of the valuable services of Lady Denham and the energetic Committee of the newly established Maternity and Child Welfare Clinic erected by the joint financial contributions of the Imperial Government and the Mayor and Town Council of the City, and in conclusion I wish to record my appreciation of the extremely informative and comprehensive report of the City Medical Officer of Health with whose recommendation for the further improvement of sanitary conditions in the City and environs I fully agree.

2. I attach remarks of the Government Medical Officer of Health.

Q. B. DE FREITAS,

14th September, 1932.

Enclosure 2 in No.

COPY OF A MINUTE BY THE GOVERNMENT MEDICAL OFFICER OF HEALTH COMMENTING ON THE REPORT OF THE PUBLIC HEALTH DEPARTMENT FOR THE CITY OF GEORGETOWN FOR THE YEAR 1931.

THAT the intercensal estimates of the population should have erred on the right side in that there has been an artificially higher death-rate recorded than is actually found to be the case when compared with the more accurate census of the population must be gratifying to the Medical Officer of Health. A reversal of the position when presenting the 1931 figures would have been distinctly disappointing, if unavoidable.

The vital statistics as a whole compare very favourably with those of the capital towns of the West Indies, and though there, unfortunately, chances to be a comparatively low birth-rate for the year under review with a proportionally higher infantile mortality, both the general death-rate of 18.5, and that of each of the prominent diseases tabled on page 20 of the Report continues to indicate the gradual but persistent reduction in the causes associated with the mortality under the several headings. Prominent among these are the factors associated with the cessation of the older conservancy system and the installation of a modern sewerage plant. The rapid decline in the number of notifications of and deaths from enteric fever is of especial interest in this connexion.

The City has been fortunate, as has the Colony as a whole, in the absence of any marked outbreak of any of the infectious diseases, not excluding malaria, during the year under review; deductions based on a forecast of the statistical returns for this past year should therefore be guarded. There appears to be little doubt, however, that the general trend is favourable and lasting.

The studied remarks of the Medical Officer of Health in relation to the housing problem in the poorer wards of the City and their corroboration as revealed in the tabled figures, more especially of tuberculosis and other respiratory conditions, warrants the Mayor and Town Council's most immediate and urgent consideration and necessary action. The widespread attention of local authorities to this problem and that of town planning in general in recent years in England and elsewhere, and the rapidly accumulating evidence, social, economic, and hygienic, all pointing to the need for carefully controlled slum clearance and increased sanitary amenities for the small owner and occupier, should satisfy natural caution and justify initiation of a housing programme.

This appreciable increase in the number of notifications of tuberculosis during 1931 is disquieting, though to a certain extent this figure is influenced by the activities of the Society for the Prevention and Treatment of Tuberculosis, and to the further fact that the case increase is offset by a reduction amounting to five deaths in comparison with the quinquennial average.

No one can question the correctness of the Medical Officer of Health's contention mentioned on page 10, paragraph VII, that a local authority should ultimately be responsible for anti-tuberculosis endeavours within its jurisdiction, but the suggestion put forward that the present Health Visitors working under the auspices of the Society should be attached to the City Health Department, the cost of dispensary treatment remaining with the Society, in exchange for the grant-in-aid made by the Council, will need further careful consideration. The salaries and allowances of the three Health Visitors at present working entirely within the City boundaries amount to considerably more than the sum granted by the Council to the Society, apart from the cost of treatment to City patients.

The value of making Ophthalmia Neonatorum a notifiable disease (in November, 1930, not December, as stated in the Report) has already become manifest, as evidenced on page 29 of the 36 cases thus brought under supervision.

Of the non-notifiable diseases the Medical Officer of Health has rightly emphasized those of malaria and the venereal diseases. The endemic level of the former in the City is still too high, although the reduction in the deaths registered in 1931 as due to this mosquito-borne disease is gratifying. It is to be hoped that a reduction *inter alia* in the number of grass-grown earth drains throughout the City will annually be effected by the Council.

The need for incorporating initial measures in relation to the control of the venereal diseases has been foreshadowed by Government in the draft of the Public Health Bill now under consideration by a Select Committee of the Legislative Council. The co-operation now existing between the Ante-natal Clinic and the Venereal Diseases Treatment Centre at the Public Hospital, Georgetown, merits the fullest encouragement and extension, but much systematic education and propaganda will be necessary before expectant mothers will be made to realize the advantages of regular attendance and early and efficient treatment. While the percentage that availed themselves of such treatment appears disappointing and small the number is still appreciable, and it may confidently be hoped that the percentage will rise year by year as knowledge spreads and benefits are appreciated.

The number of deaths from pneumonia, 80 out of 167 respiratory diseases, is high and this disease as a cause of death continues to head the list presented in Chart E on page 30 of the Report. The casual factors associated with these respiratory conditions are unfortunately intimately related to the general social and economic status of the community, and therefore the more difficult to tackle independently therefrom. The need for housing reform, and more especially in the wards of Charlestown and Albouystown, has already been referred to.

The annexed report of the acting Medical Officer to the Department of Maternity and Child Welfare is sufficiently explanatory and calls for no special comment, as also that of the Chief Sanitary Inspector. The valuable work of the former and the manifest activities of the latter must be a source of great satisfaction to the Medical Officer of Health.

Q. B. DE FREITAS,
13th September, 1932.

B. N. V. BAILEY,
13th September, 1932.

TABLE 4.—(Continued).
HOSPITALS—GEORGETOWN NEW AMSTERDAM, SUDDIE, BARTICA, NORTH WESTERN DISTRICT AND KAMAKUSA.
Return of Diseases (Out-Patients) and of Diseases and Deaths (In-Patients) for the year 1931.

DISEASES.	P.H., Georgetown.				P.H., New Amsterdam.				P.H., Suddie.				P.H., Bartica.				P.H., N.W.D.				P.H., Kamakusa.				P.H., Potaro.				Totals.						
	Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Cases.	Deaths.					
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.									
Brought forward	4,967	4,529	4,633	516	2,982	2,797	981	117	892	903	602	73	834	896	219	19	1,233	1,230	294	28	247	7	39	9	72	23	4	11,229	10,417	6,303	762				
91. Affections of the Circulatory System.—(Contd.)																																			
(a) Aneurysm	8	6	17	2	3	11	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	6	18	2				
(b) Arterio-sclerosis	17	7	64	12	11	11	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	34	19	67	12	2			
(c) Other Diseases	34	23	8	2	5	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	31	8	2	2			
92. Embolism or Thrombosis (non-cerebral)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
93. Diseases of the veins—																																			
(a) Haemorrhoids	159	35	112	...	78	52	58	...	5	4	29	...	3	2	2	...	6	4	2	...	2	...	...	...	...	...	...	254	97	194	...	...	
(b) Varicose Veins	5	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	4	4	...	...	
(c) Phlebitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
94. Diseases of the Lymphatic System—																																			
(a) Filariasis	112	108	178	8	53	135	22	...	1	2	19	1	14	35	6	...	2	1	...	...	4	...	...	...	...	...	227	372	225	9	...	...	
(b) Filarial Babo	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Elephantiasis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(d) Lymphangitis, lymphadenitis (non-filarial)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(e) Unclassified	50	49	41	...	92	69	37	...	25	15	7	4	6	2	1	...	9	3	2	1	1	...	...	...	...	...	168	114	85	1	...	...	
95. Haemorrhage of undetermined cause	6	1	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
96. Other affections of the Circulatory system	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F.—Affections of the Respiratory System—																																			
97. Diseases of the Nasal Passages—																																			
(a) Adenoids	1	3	29	...	2	2	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Polypus	5	5	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Rhinitis	23	22	2	...	5	11	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(d) Coryza	53	49	5	...	436	388	25	...	6	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(e) Other diseases of nasal passages	13	14	19	...	76	105	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
98. Affections of the Larynx—																																			
Laryngitis	10	15	9	...	1	30	21	...	94	149	5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchitis—																																			
(a) Acute	12	12	84	13	...	...	...	...	36	73	41	...	48	32	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Chronic	150	153	224	47	331	308	91	...	90	165	122	...	112	107	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Undifferentiated	798	733	233	11	...	...	...	...	460	633	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
100. Broncho-pneumonia	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
101. Pneumonia—																																			
(a) Lobar	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Unclassified	10	3	31	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
102. A. Pleurisy	21	16	44	6	9	8	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
B. Empty em	3	1	10	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
103. Congestion of the Lungs	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
104. Gargrene of the Lungs	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carried forward	6,475	5,894	5,963	676	4,718	4,708	1,385	161	1,617	2,014	378	92	1,975	1,941	249	27	1,482	1,372	335	37	342	8	89	17	92	33	4	15,801	14,980	8,784	1,010	...	...

TABLE 4—(Continued).
HOSPITALS—GEORGETOWN, NEW AMSTERDAM, SUDDIE, BARTICA, NORTH WESTERN DISTRICT, KAMAKUSA AND POTARO.
Return of Diseases (Out-Patients) and of Diseases and Deaths (In-Patients) for the Year 1931.

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	Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Cases.	Deaths.								
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.										
Brought forward	7,197	6,548	6,712	766	6,183	6,859	1,614	197	2,101	2,791	1,118	37	1,316	1,300	289	31	1,772	1,620	356	40	435	13	82	17	135	48	9	19,089	18,879	10,210	1,132							
VI.—Diseases of the Digestive System—(Con.)																																						
116. Diseases due to Intestinal parasites—(Con.)																																						
(a) Nematoda (other than Ancylostoma) (Con.)—																																						
Trichina																																						
Dracunculosis																																						
Strongylus																																						
Oxyuris																																						
(d) Coecidia																																						
(e) Other Parasites																																						
(f) Unclassified																																						
117. Appendicitis—																																						
(a) Acute																																						
(b) Sub-acute and chronic																																						
(c) Unclassified																																						
118. Hernia																																						
119. A. Affections of the Anus, Fistula, &c.																																						
B.—Other affections of the Intestine—																																						
(a) Enteroptosis																																						
(b) Constipation																																						
(c) Other affections																																						
120. Acute Yellow Atrophy of the Liver																																						
121.—Hydatid of the Liver																																						
122. Cirrhosis of the Liver—																																						
(a) Alcoholic																																						
(b) Other forms																																						
123. Biliary Calculus																																						
124. Other affections of the Liver—																																						
(a) Abscess																																						
(b) Hepatitis																																						
(c) Cholecystitis																																						
(d) Jaundice																																						
125. Diseases of the Pancreas																																						
126. Peritonitis (of unknown cause)																																						
127. Other affections of the Digestive System																																						
VII.—Diseases of the Genito-Urinary System (non-Veneral)—																																						
128. Nephritis—																																						
(a) Acute																																						
Carried forward	7,533	7,217	7,175	786	6,838	7,537	1,764	299	2,165	2,886	1,221	101	1,367	1,379	301	31	1,921	1,812	370	40	491	15	86	17	151	52	9	20,158	20,808	10,925	1,184							

TABLE 4.—(Continued).
 HOSPITALS—GROBETOWN, NEW AMSTERDAM, SUDDIE, BARTICA, NORTH-WESTERN DISTRICT, KAMAKUSA AND POTARO.
 Return of Diseases (Out-Patients) and of Diseases and Deaths (In-Patients) for the year 1931.

DISEASES.	P.H., Georgetown.				P.H., New Amsterdam.				P.H., Suddie.				P.H., Bartica.				P.H., N.W.D.				P.H., Kamakusa.				P.H., Potaro.				Totals.							
	Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Out-Patients.		In-Patients.		Cases.	Deaths.						
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.								
Brought forward	7,533	7,217	7,175	786	6,538	7,537	1,764	269	2,165	2,886	1,221	101	1,377	1,372	301	31	1,923	1,812	370	46	491	15	86	17	151	52	9	...	20,158	20,866	10,925	1,184				
VII.—Diseases of the Genito-Urinary System (non-Veneral).—(Contd.)																																				
128 Nephritis (Contd.)—																																				
(a) Chronic (128)	35	23	154	45	127	93	89	21	31	49	47	4	8	17	12	4	6	6	8	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Uracemia	...	...	13	11	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Unclassified	42	62	49	9	23	28	9	10	48	28	15	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
130. A. Chyluria (Non-flarial)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
B. Schistosomiasis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
131. Other affections of the Kidneys—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyellitis, &c.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
132. Urinary Calculus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
133. Diseases of the Bladder—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cystitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Stricture	34	31	20	7	58	84	7	1	7	4	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Other	51	...	66	1	37	10	47	4	2	...	6	2	8	...	2	...	3	...	1	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
B. Other Diseases of the Genito-Urinary System	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Hypertrophy	31	31	30	3	1	...	...	...	43	21	6	1	2	3	...	...	1	...	2	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Prostatitis	9	...	33	3	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
136. Diseases (non-venereal) of the Genital Organs of Man—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Epididymitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Orchitis	83	...	39	...	27	...	...	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Hydrocele	211	...	122	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(d) Ulcer of Penis	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(e) Phimosis and Paraphimosis	17	...	79	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(f) Other	12	...	17	...	151	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
137. Cysts or other non-malignant tumours of the Ovaries	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Salpingitis	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Uterine Tumours (non-malignant)	...	...	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
140. Uterine Haemorrhage (non-puerperal).	...	...	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
141. A. Metritis	...	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
B. Other affections of the Female Genital Organs—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(a) Displacements of the Uterus	4	...	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Amenorrhoea	88	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Dysmenorrhoea	27	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(d) Leucorrhoea	62	...	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(e) Other Affections	45	...	29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carried forward	8,061	7,706	8,123	875	7,267	8,639	2,157	244	2,314	3,116	1,382	127	1,402	1,512	331	36	1,945	1,901	303	42	514	15	87	17	178	65	9	...	31,681	22,945	12,452	1,310				

TABLE 4—(Continued.)
HOSPITALS—GEORGETOWN, NEW AMSTERDAM, SUDDIE, BARTICA, NORTH WESTERN DISTRICT AND KAMAKUSA,
Returns of Diseases (Out-Patients) and of Diseases and Deaths (In-Patients) for the Year 1931.

DISEASES.	P. H., Georgetown			P. H., New Amsterdam			P. H., Suddie			P. H., Bartica			P. H., N.W.D.			P. H., Kamakusa			P. H., Potaro			Totals.																	
	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Cases		Deaths												
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.											
Brought forward	8,513	8,144	9,791	916	7,444	8,947	2,572	362	2,397	3,177	1,701	134	1,431	1,581	383	35	1,991	1,991	451	45	532	15	93	17	196	69	11	...	22,477	23,594	15,002	1,409							
IX.—Affections of the Skin and Cellular Tissues—Contd.																																							
155. Other Diseases of the Skin.—(contd.)—																																							
(f) Myiasis	...	...	4	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(g) Chiggers	...	...	...	...	157	87	140	1	281	98	87	28	11	20	...	...	442	176	65	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(h) Ulcers	169	82	117	...	160	87	28	...	43	52	7	...	12	11	1	...	20	21	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(i) Other Skin Affections	199	153	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
X.—Diseases of Bones and Organs of Lesions (other than Tuberculous)—																																							
156. Diseases of Bones—																																							
Osteitis and Osteomyelitis	15	15	28	...	2	...	2	...	...	...	2	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
157. Diseases of Joints—																																							
(a) Arthritis	147	167	90	...	246	351	32	...	35	42	2	...	32	15	6	...	9	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Synovitis	13	16	31	...	29	12	12	...	1	2	5	...	7	4	2	...	4	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
158. Other Diseases of Bones or Organs of Locomotion	170	320	30	...	107	117	20	...	193	228	10	...	16	5	6	...	15	9	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
XI.—Malformations—																																							
159. Malformations—																																							
(a) Hydrocephalus	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Hypspadias	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Scis Bifida, &c.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(d) Unclassified	...	...	3	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
XII.—Diseases of Infancy—																																							
160. Congenital Deblility	1	...	60	33	3	1	8	4	...	...	18	13	2	...	1	1	...	...	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
161. Premature Birth	...	...	26	25	...	...	9	9	...	...	6	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
162. Other Affections of Infancy	...	...	18	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
163. Infant Neglect (infants of three months or over)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
XIII.—Affections of Old Age—																																							
164. Senility—																																							
(a) Senile Dementia	...	...	1	11	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Senile Deblility	...	...	42	98	13	37	65	28	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
XIV.—Affections produced by External Causes—																																							
165. Suicide by Poisoning	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
166. Corrosive Poisoning (intentional)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
167. Suicide by Gas Poisoning	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carried forward	9,244	8,943	10,402	960	8,190	9,677	2,850	287	2,920	3,609	1,873	153	1,536	1,628	421	36	2,486	2,204	537	48	606	15	96	17	222	69	11	...	25,203	26,140	16,175	1,540							

TABLE 4—(Continued.)
 HOSPITALS—GEORGETOWN, NEW AMSTERDAM, SUDDIE, BARTICA, NORTH WESTERN DISTRICT, KAMAKUSA AND POTARO.
 Return of Diseases (Out Patients) and of Diseases and Deaths (In-Patients) for the Year 1931.

DISEASES.	P.H., Georgetown			P.H., New Amsterdam.			P.H., Suddie			P.H., Bartica			P.H., N.W.D.			P.H., Kamakusa			P.H., Potaro.			Totals.																		
	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		In-Patients	Out-Patients		M.	F.	In-Patients	Deaths																
	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	M.	F.	C.	D.	Cases	Deaths														
Brought forward	9,244	8,943	10,402	989	8,190	9,677	2,855	287	2,920	3,609	1,853	103	1,535	1,638	421	36	2,486	2,201	537	48	696	15	96	17	222	69	11	25,293	26,145	16,176	1,549									
XIV.—Affections produced by External Causes—(Contd.)																																								
168. Suicide by hanging or strangulation	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
169. Suicide by drowning	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
170. Suicide by firearms	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
171. Suicide by cutting or st. bling instru- ments	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
172. Suicide by jumping from a height	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
173. Suicide by crushing	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
174. Other suicides	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
175. Food Poisoning—																																								
(a) Botulism	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Other	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
176. Attacks of poisonous animals—																																								
(a) Snake bite	2	1	7	...	...	...	...	...	3	3	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(b) Insect bite	4	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(c) Unclassified	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
177. Other accidental poisonings	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
178. Burns (by fire)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
179. Burns (other than by fire)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
180. Suffocation (accidental)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
181. Poisoning by gas (accidental)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
182. Drowning (accidental)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
183. Wounds (by firearms, war excepted)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
184. Wounds (by cutting or stabbing instru- ments)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
185. Wounds (by fall)	149	69	112	1	143	63	98	1	21	3	45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
186. Wounds (rupture of internal organs)	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
187. Wounds (by machinery)
188. Wounds (crushing, e.g., railway accel- erants, &c.)
189. Contusions—injuries inflicted by ani- mals, &c.
190. Wounds inflicted on active service
191. Executions of civilians by belligerents.
192. A.—Over fatigue
B.—Hunger or Thirst
193. Exposure to Cold, Frost-bite, &c.
194. Exposure to Heat—
(a) Heatstroke
(b) Sunstroke
Carried forward	9,412	9,018	10,656	1,010	8,240	9,766	2,988	295	2,994	3,623	1,911	156	1,565	1,641	445	36	2,522	2,214	561	49	627	15	105	17	246	71	14	25,676	26,538	16,619	1,663									

TABLE 5.

Return of Surgical Operations.—1931.

OPERATIONS.	P. H. Georgetown.		P. H. New Amsterdam.		P. H. Suddie.		P. H. Bartica.		P. H. Mabaruma.		P. H. Kanakusa.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
HEAD AND NECK.												
<i>Cranium—</i>												
Mastoiditis, acute—radical cure	5											
Do. chronic—do.	11											
Mastoid abscess—incision												
Necrosis of mastoid—sequenctomy and drainage			1									
Abscess scalp—incised	2											
Cyst, sebaceous—excised			1									
<i>Face—</i>												
<i>Eyelid—</i>												
Dacryocystitis—excision of lacrimal sac	1		1									
Do. —incision			1									
Cysts, taral—incised	12											
Do. do. —removed	2											
Do. do. —excision—radical operation			5									
Papilloma of conjunctiva—excised	1											
<i>Eye—</i>												
Glaucoma, chronic—trephined	8											
Panophthalmitis —evisceration	1											
Do. —enucleation			3									
Phthisis bulbi —excision	1											
Cornua—Pterygium—transplanted	6		2									
Do. —excised			1									
Foreign body—removed	10		2									
Leucoma adhaerens—incised	2											
Iris—Prolapse—excised	6											
Iritis, chronic—iridectomy	1											
Occlusio pupillae—iridectomy	1											
Lens—Cataract, senile—extraction	44											
Do. traumatic—extraction	1											
Do. after—dissection	1											
<i>Nose—</i>												
Foreign body—removed	4											
Polypus—removed	9		3									
Turbinales, enlarged—removed			3									
Cheek—Keloid—excised	2											
Papilloma—excised	1											
Cyst—excised	1		1		1							
Cyst, sebaceous—removed					1							
Rodent ulcer—excised	2											
Abscess—incised	3											
Atresia, ext. ear—excised			1									
Exostosis, ext. canal—excised			1									
Polypus, ear—removed			2									
Lipoma—removed			1									
Neoplasm, right ear—removed			1									
Jaws—Fracture—set	1											
Fracture, necrosis—incised, scraped			1									
Necrosis—sequestrectomy	3											
Odontoma, malignant—resection lower jaw	1											
Abscess—incised	2											
Osteomyelitis—tooth extraction			1									
Teeth, septic—extraction			1									
Dental caries									4			
Lip—Wound, lacerated—sutured	1											
Papilloma—excised	1											
Mucocoele—excised	1											
<i>Mouth and Pharynx—</i>												
Tonsils, enlarged, and Adenoids—removed	140	1	21		3							
Do., enlarged—tonsillectomy and adenectomy			7		3							
Do., septic—scraped			1									
Adenoids—adenectomy			1									
Cyst, palatal—removed			1									
Oesophagus—foreign body—removed	2											
<i>Ear—</i>												
Foreign body—removed	17											
<i>Neck—</i>												
Adenoma thyroid—hemi-thyroidectomy	4											
Cyst do. excised	1											
Cyst—incised, scraped					1							
Cyst, septic—excised	1											
Multiple wounds—sutured	1											
Foreign body—removed	1		1									
Sinus—excised	3											
Abscess—incised	6											
Carried forward	324	1	67		9				4			

TABLE 5.—(Continued).

OPERATIONS.	P. H. Georgetown.		P. H. New Amsterdam.		P. H. Suddie.		P. H. Bartica.		P. H. Mabaruma.		P. H. Kama-kusa.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Brought forward	324	1	67	...	9	...	...	...	4	...	...	...
UPPER EXTREMITY.												
<i>Shoulder</i> —												
Dislocation—reduced	1	...	...	...	...	...	...	...	...	...	...	...
Lipoma—excised	2	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	3	...	1	...	...	...	...	...	...	...	...	...
<i>Axilla</i> —												
Abscess—incised	5	...	...	...	...	...	...	...	...	...	...	...
<i>Upper Arm</i> —												
Fracture—set	7	...	...	...	...	...	...	...	...	...	...	...
Lacerated—amputation	2	1	...	...	...	...	...	...	...	...	...	...
Do. —sutured	2	...	...	...	...	...	...	...	...	...	...	...
Sinus stump—radical cure	1	...	...	...	...	...	...	...	...	...	...	...
Cellulitis—incised, drained	6	1	...	...	...	...	...	...	...	...	...	...
Abscess—incised	1	...	...	...	...	...	...	...	...	...	...	...
<i>Elbow</i> —												
Fracture—set	5	...	...	...	...	...	...	...	...	...	...	...
Dislocation—reduced	2	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	1	...	...	...	...	...	...	...	...	...	...	...
Synovitis—aspiration	...	...	1	...	...	...	...	...	...	...	...	...
<i>Forearm</i> —												
Fracture—set	29	...	...	...	...	...	...	...	...	...	...	...
Do. —poring radius	...	...	1	...	...	...	...	...	...	...	...	...
Fracture, compound, cut tendon—sutured, set	...	...	1	...	...	...	...	...	...	...	...	...
Ulcerated hand—amputated	1	...	...	...	...	...	...	...	...	...	...	...
Tendons cut—sutured	2	...	...	...	...	...	...	...	...	...	...	...
Artery cut—ligatured	1	...	...	...	...	...	...	...	...	...	...	...
Lipoma—excised	4	...	...	...	...	...	...	...	...	...	...	...
Foreign body—removed	1	...	...	...	...	...	...	...	...	...	...	...
Sequestrum—removed	1	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	2	...	...	...	...	...	...	...	...	...	...	...
Incised wound—sutured	...	...	1	...	...	...	...	...	...	...	...	...
Gangrene—amputated	...	...	...	...	1	...	...	...	...	...	...	...
<i>Hand</i> —												
Foreign body—removed	13	...	...	...	...	...	...	...	...	...	...	...
Ganglion—excised	13	...	...	...	...	...	...	...	...	...	...	...
Lacerated—repaired	13	...	...	...	...	...	...	...	...	...	...	...
Cellulitis—incised	...	...	...	...	...	...	...	...	...	...	...	...
Lipoma—excised	...	...	...	...	...	...	...	...	...	...	...	...
Wound, incised—sutured	...	...	1	...	...	...	...	...	...	...	...	...
Do. lacerated—sutured	...	...	2	...	...	...	...	...	...	...	...	...
Tendon, severed—sutured	...	...	1	...	...	...	...	...	...	...	...	...
Papilloma—excised	...	...	4	...	...	...	...	...	...	...	...	...
<i>Finger</i> —												
Fibroma—excised	4	...	...	...	...	...	...	...	...	...	...	...
Dislocation—reduced	2	...	...	...	...	...	...	...	...	...	...	...
Tendon, cut—sutured	1	...	2	...	...	...	...	...	...	...	...	...
Lacerations—sutured	4	...	...	...	...	...	...	...	...	...	...	...
Do. —amputation	3	...	1	...	...	...	...	...	...	...	...	...
Necrosis—sequestrectomy	3	...	1	...	...	...	...	...	...	...	...	...
Do. —amputation	...	...	1	...	...	...	...	...	...	...	...	...
Cellulitis and Necrosis—amputation	8	...	1	...	...	...	...	...	...	...	...	...
Cellulitis—incised	4	...	...	...	...	...	...	...	...	...	...	...
Whitlow—do.	...	...	1	...	...	...	...	...	...	...	...	...
Gangrene—do.	...	...	1	...	...	...	...	...	...	...	...	...
Do. —amputation	2	...	...	...	...	...	...	...	...	...	...	...
Septic—amputation	...	...	4	...	...	...	...	...	...	...	...	...
Crushed—partial amputation	...	...	...	...	1	...	...	...	...	...	...	...
LOWER EXTREMITY.												
<i>Hip</i> —												
Carcinoma—excised	1	1	...	...	...	...	...	...	...	...	...	...
Pus in joint—opened, drained	1	...	...	...	...	...	...	...	...	...	...	...
<i>Buttock</i> —												
Cyst—excised	1	...	...	...	...	...	...	...	...	...	...	...
Fibroma—excised	1	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	4	...	...	...	...	...	...	...	...	...	...	...
Psoas Abscess—opened, drained	...	...	...	...	1	...	...	...	...	...	...	...
<i>Groin</i> —												
Wound, lacerated—sutured	1	...	...	...	...	...	...	...	...	...	...	...
Lymphangiectasis—excised	1	...	...	...	...	...	...	...	...	...	...	...
Glands, septic—removed	2	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	6	...	...	...	...	...	...	...	...	...	...	...
Sinus—incised, scraped	...	...	5	...	...	...	...	...	...	...	...	...
Adenitis, suppurative—incised	...	...	5	...	...	...	...	...	...	...	...	...
Carried forward	471	4	101	...	12	...	...	...	5	...	...	...

TABLE 5.—(Continued).

OPERATIONS.	P. H. Georgetown.		P. H. New Amsterdam.		P. H. Suddie.		P. H. Hartiga.		P. H. Mabaruma.		P. H. Kama-kusa.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Brought forward	471	4	101	...	12	...	...	...	5	...	...	...
LOWER EXTREMITY—Contd.												
<i>Thigh—</i>												
Tumour—excised	1	...	...	...	...	...	...	...	...	...	...	...
Fracture—reduced, set	2	...	...	...	...	...	...	...	...	...	...	...
Femoral artery, cut—ligatured	1	...	...	...	...	...	...	...	...	...	...	...
Fracture, compound—cleaned, set	1	...	...	...	...	...	...	...	...	...	...	...
Sinus—excised	1	...	...	...	...	...	...	...	...	...	...	...
Osteomyelitis, chronic—radical cure	1	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised, drained	14	...	3	...	1	...	...	...	...	...	...	...
<i>Knee—</i>												
Bursa, enlarged—excised	1	...	...	...	...	...	...	...	...	...	...	...
Ankylosis—reduced	2	...	...	...	...	...	...	...	...	...	...	...
Pseudo-ankylosis—extension	...	...	1	...	...	...	...	...	...	...	...	...
Foreign body—removed	3	...	1	...	...	...	...	...	...	...	...	...
Pus in joint—incised, drained	4	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	1	1	1	...	...	...	...	...	...	...	...	...
Do. —counter incision	...	...	2	...	...	...	...	...	...	...	...	...
Osteomyelitis—incised, scraped	...	...	1	...	...	...	...	...	...	...	...	...
<i>Leg—</i>												
Fracture—set	7	...	...	...	...	...	...	...	...	...	...	...
Wound of leg and compound fracture of tibia and fibula—cleaned, set	...	...	...	...	1	...	...	...	...	...	...	...
Aneurysm—radical cure	1	...	...	...	...	...	...	...	...	...	...	...
Tumour—excised	1	...	...	...	...	...	...	...	...	...	...	...
Artery, ruptured—sutured	1	1	...	...	...	...	...	...	...	...	...	...
Wounds, lacerated—sutured	4	...	2	...	...	...	...	...	...	...	...	...
Osteomyelitis—radical cure	9	...	...	...	...	...	...	...	...	...	...	...
Do. tibia—sequestrectomy	...	...	1	...	...	...	...	...	...	...	...	...
Cellulitis—incised, drained	1	...	...	...	...	...	...	...	...	...	...	...
Do. —multiple incisions	...	...	1	1	...	...	...	...	...	...	...	...
Ulcer, chronic—skin graft	1	...	...	...	...	...	...	...	...	...	...	...
Do. chronic—excised, scraped	2	...	3	...	2	...	...	...	...	...	...	...
Do. —cauterisation	...	...	2	...	...	...	...	...	...	...	...	...
Abscess—incised, drained	9	...	2	...	...	...	...	...	...	...	...	...
Gangrene—amputation	1	1	...	...	1	...	...	...	...	...	...	...
Haematoma—incised	...	...	1	...	...	...	...	...	...	...	...	...
Varicose veins—obliterated	...	...	1	...	...	...	...	...	...	...	...	...
Hypertrophic growth—excised	...	...	1	...	...	...	...	...	...	...	...	...
Do. do. —cautery and scraping	...	...	1	...	...	...	...	...	...	...	...	...
<i>Ankle—</i>												
Fracture—reduced	2	...	...	...	...	...	...	...	...	...	...	...
Varicose eczema—veins ligatured	1	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	1	...	...	...	...	...	...	...	...	...	...	...
Tendon, cut—sutured	...	...	2	...	1	...	...	...	...	...	...	...
<i>Foot—</i>												
Talipes—manipulated	1	...	...	...	...	...	...	...	...	...	...	...
Foreign body—removed	2	...	1	...	...	...	...	...	...	...	...	...
Gangrene—amputation	1	...	...	...	...	...	...	...	...	...	...	...
Ganglion—excised	...	...	1	...	...	...	...	...	...	...	...	...
Wound, incised—sutured	...	...	1	...	...	...	...	...	...	...	...	...
Do. lacerated—sutured	...	...	2	...	...	...	...	...	...	...	...	...
Do. do. —amputation	...	...	1	...	...	...	...	...	...	...	...	...
Ulcer—scraped	...	...	4	...	...	...	...	...	...	...	...	...
Necrosis—incised, scraped	...	...	1	...	...	...	...	...	...	...	...	...
<i>Toe—</i>												
Nail, damaged—removed	1	...	...	...	...	...	...	...	...	...	...	...
Nail, ingrowing—radical cure	1	...	...	...	...	...	...	...	...	...	...	...
Nail, ingrowing—excised	...	...	2	...	...	...	...	...	...	...	...	...
Hammer toe—radical cure	1	...	...	...	...	...	...	...	...	...	...	...
Foreign body—removed	1	...	...	...	...	...	...	...	...	...	...	...
Necros'd toe— do.	3	...	...	...	...	...	...	...	...	...	...	...
Septic toe—nail removed	2	...	...	...	...	...	...	...	...	...	...	...
Septic toe—amputated	2	...	11	...	3	...	...	...	...	...	...	...
Necrosis — do.	...	...	2	...	...	...	...	...	...	...	...	...
Ainhum — do.	...	...	1	...	...	...	...	...	...	...	...	...
Gangrene — do.	...	...	...	...	1	...	...	...	...	...	...	...
Osteomyelitis—amputated	...	...	...	...	1	...	...	...	...	...	...	...
Ulcer, chronic—scraped	...	...	...	...	1	...	...	...	...	...	...	...
Paronychia—avulsion and scraping	...	...	1	...	...	...	...	...	...	...	...	...
Sinus and onychia—incision and avulsion	...	...	1	...	...	...	...	...	...	...	...	...
THORAX AND CHEST.												
Foreign body—removed	2	...	...	...	...	...	...	...	...	...	...	...
Sinus—explored, incised, scraped	1	...	1	...	...	...	...	...	...	...	...	...
Do. —rib resection	...	...	1	...	...	...	...	...	...	...	...	...
Empyema—radical cure	8	1	...	...	...	...	...	...	...	...	...	...
Do. —modified estlander's	...	...	1	...	...	...	...	...	...	...	...	...
Carried forward	570	8	159	1	24	...	...	...	5	...	...	...

TABLE 5.—(Continued).

OPERATIONS.	P. H. Georgetown.		P. H. New Amsterdam.		P. H. Suddle.		P. H. Bartica.		P. H. Mabaruma.		P. H. Kama-kusa.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Brought forward	570	8	159	1	24	...	...	...	5	...	...	...
UPPER EXTREMITY—(Continued).												
<i>Breast—</i>												
Papilloma—excised	1	...	...	...	...	...	...	...	...	...	...	...
Lipoma—excised	3	...	...	...	...	...	...	...	...	...	...	...
Carcinoma—radical removal	8	...	...	...	...	...	...	...	...	...	...	...
Do. —local removal	1	...	...	...	...	...	...	...	...	...	...	...
Recurrent Carcinoma—excision of glands	1	...	...	...	...	...	...	...	...	...	...	...
Sinus—excised	12	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	3	1	...	...	...	...	...	...	...	...	...	...
Adenoma, cystic—removed	...	...	1	...	...	...	...	...	...	...	...	...
Cyst — do.	...	...	...	...	1	...	...	...	...	...	...	...
ABDOMEN.												
<i>Abdominal Wall—</i>												
Wound, ruptured—sutured	1	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised, drained	12	...	2	...	1	...	...	...	...	...	...	...
Extra peritoneal abscess—incised	...	...	...	...	...	...	...	...	...	...	...	...
Hypogastric abscess— do.	...	...	1	...	...	...	...	...	...	...	...	...
Sinus—incised	...	...	1	...	...	...	...	...	...	...	...	...
Extravasation of urine—multiple incisions	...	...	1	...	...	...	...	...	...	...	...	...
<i>Laparotomy—</i>												
Liver, lacerated—packed	1	1	...	...	...	...	...	...	...	...	...	...
Volvulus—reduced	6	1	...	...	...	...	...	...	...	...	...	...
Do. recurrent—reduced	1	...	...	...	...	...	...	...	...	...	...	...
Obstruction, intestinal—reduced	2	1	...	...	...	...	...	...	...	...	...	...
Tumour, malignant—inoperable	2	...	1	1	...	...	...	...	...	...	...	...
Ileum—carcinoma—excised	1	1	...	...	...	...	...	...	...	...	...	...
Ulcer, gastric—gastroenterostomy	1	...	...	...	...	...	...	...	...	...	...	...
Appendicitis, acute—appendectomy	87	1	...	...	...	...	...	...	...	...	...	...
Do. chronic— do.	18	...	4	...	...	...	...	...	...	...	...	...
Abscess, appendicular—appendectomy, drainage	4	1	1	...	...	...	...	...	...	...	...	...
Do. do. —laparotomy	...	...	2	2	...	...	...	...	...	...	...	...
Cholecystitis—cholecystectomy	1	...	...	...	...	...	...	...	...	...	...	...
Cholelithiasis— do.	6	...	...	...	...	...	...	...	...	...	...	...
Cholecystitis—cholecystostomy	3	...	...	...	...	...	...	...	...	...	...	...
Bladder and colon—Stula—radical cure	1	...	...	...	...	...	...	...	...	...	...	...
Ulcer, gastric—perforated—sutured drained	5	1	...	...	...	...	...	...	...	...	...	...
Ulcer, duodenal—perforated do. do.	2	1	...	...	...	...	...	...	...	...	...	...
Ulcer, small gut— do. —excised, sutured	2	1	...	...	...	...	...	...	...	...	...	...
Peritonitis—drained	3	2	1	1	...	...	...	...	...	...	...	...
Spleen, gangrenous—removed, drained	1	1	...	...	...	...	...	...	...	...	...	...
Appendix do. —appendectomy, drainage	1	1	...	...	...	...	...	...	...	...	...	...
Abscess, subphrenic—drained	2	1	...	...	...	...	...	...	...	...	...	...
Fibroids—hysterectomy	47	1	...	...	...	...	...	...	...	...	...	...
Cyst, ovarian— do.	1	...	...	...	...	...	...	...	...	...	...	...
Cyst, do. —removed	6	...	...	...	...	...	...	...	...	...	...	...
Uterus, prolapsed—anterior and posterior colporrhaphy	1	...	...	...	...	...	...	...	...	...	...	...
Pelvis, contracted—Caesarean section	2	1	...	...	...	...	...	...	...	...	...	...
Uterus, retroverted—ventral fixation	4	...	...	...	...	...	...	...	...	...	...	...
Cyst, ovarian, malignant—inoperable	3	1	...	...	...	...	...	...	...	...	...	...
Cyst do. dermoid—removed	1	...	...	...	...	...	...	...	...	...	...	...
Ectopic gestation—removed	5	1	...	...	...	...	...	...	...	...	...	...
Hydro-salpinx—removed	1	...	...	...	...	...	...	...	...	...	...	...
Salpingitis—salpingectomy	10	...	...	...	...	...	...	...	...	...	...	...
Do. —hysterectomy	4	...	...	...	...	...	...	...	...	...	...	...
Fus tubes—salpingectomy	7	...	...	...	...	...	...	...	...	...	...	...
Do. —drained	2	...	...	...	...	...	...	...	...	...	...	...
<i>Hernia—</i>												
Right inguinal—radical cure	82	1	14	...	...	...	...	...	...	...	...	...
Do. do. —herniotomy	...	...	...	...	1	...	...	...	...	...	...	...
Left do. —radical cure	35	...	5	...	...	...	...	...	...	...	...	...
Right strangulated—radical cure	11	2	3	...	...	...	...	...	...	...	...	...
Left do. do.	5	1	1	...	1	...	...	...	...	...	...	...
Double inguinal— do.	21	...	1	...	...	...	...	...	...	...	...	...
Right femoral do.	4	...	...	...	...	...	...	...	...	...	...	...
Do. strangulated—radical cure	1	1	...	...	...	...	...	...	...	...	...	...
Umbilical— do.	1	...	...	...	...	...	...	...	...	...	...	...
Ventral— do.	1	...	...	...	...	...	...	...	...	...	...	...
Recurrent right inguinal— do.	2	...	...	...	...	...	...	...	...	...	...	...
Right scrotal— do.	...	...	2	...	...	...	...	...	...	...	...	...
<i>Rectum—</i>												
Hæmorrhoids—radical cure	83	1	...	...	...	...	...	...	...	...	...	...
Do. —excision	...	...	39	1	5	...	...	...	...	...	...	...
Do. (internal)—hæmorrhoidectomy	...	...	...	...	3	1	...	...	...	...	...	...
Do. (external)— do.	...	...	...	...	1	...	...	...	...	...	...	...
Do. —injection	...	...	13	...	...	...	...	...	...	...	...	...
Stricture—dilated	3	...	...	...	...	...	...	...	...	...	...	...
Abscess—incised	5	...	2	...	...	...	...	...	...	...	...	...
Sinus—incised, scraped	...	...	4	...	...	...	...	...	...	...	...	...
Fistula—radical cure	7	...	...	...	...	...	...	...	...	...	...	...
Do. —incised	...	...	1	...	...	...	...	...	...	...	...	...
Warts, ulcerated—scraped	...	...	1	...	...	...	...	...	...	...	...	...
Carried forward	1,099	33	251	6	37	...	1	...	5	...	...	...

TABLE 5.—(Continued).

OPERATIONS.	P. H. Georgetown.		P. H. New Amsterdam.		P. H. Suddie.		P. H. Bartica.		P. H. Malabar.		P. H. Kama-kusa.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Brought forward	1,099	33	231	6	37	...	1	...	5	...	...	...
ABDOMEN—Continued.												
<i>Anus—</i>												
Fissure—radical cure	4	...	...	...	...	...	...	...	...	...	...	...
Warts, peri-anal—removed	1	...	4	...	...	...	...	...	...	...	...	...
Fistula—incised	...	...	...	...	1	...	...	...	...	...	...	...
Condylomata—excised	...	...	...	...	...	...	...	...	...	...	...	...
BACK AND VERTEBRÆ.												
Back—cyst—removed	1	...	...	...	...	...	...	...	...	...	...	...
Back—lipoma—removed	1	...	...	...	...	...	...	...	...	...	...	...
Back—carbuncle—incised	2	...	...	...	...	...	...	...	...	...	...	...
GENITO-URINARY SYSTEM.												
<i>Kidneys—</i>												
Hæmorrhage—explored	2	...	...	...	...	...	...	...	...	...	...	...
<i>Bladder—</i>												
Papilloma—removed	1	...	...	...	...	...	...	...	...	...	...	...
Wound, punctured—sutured	...	...	1	1	...	...	...	...	...	...	...	...
<i>Prostate—</i>												
Enlarged—supra-pubic cystostomy	19	3	...	...	...	...	...	...	...	...	...	...
Enlarged—prostatectomy	10	...	...	...	...	...	...	...	...	...	...	...
<i>Urethra—</i>												
Stricture—dilated	9	...	3	...	...	...	...	...	...	...	...	...
Stricture—supra-pubic cystostomy	1	...	...	...	...	...	...	...	...	...	...	...
Sinus—excised	...	...	1	...	...	...	...	...	...	...	...	...
Extravasated urine—multiple incisions	1	...	...	...	...	...	...	...	...	...	...	...
<i>Genitalia—</i>												
<i>Male—</i>												
Hydrocele, double—radical cure	39	...	5	...	...	...	...	...	...	...	...	...
Do. right — do.	41	...	10	...	2	...	...	...	...	...	...	...
Do. left — do.	40	...	10	...	2	...	...	...	...	...	...	...
Do. — do.	4	...	...	...	...	...	...	...	...	...	...	...
Do. of cord—incised, drainage	...	...	1	...	...	...	...	...	...	...	...	...
Do. — injection	...	...	1	...	...	...	...	...	...	...	...	...
Septic circumcision wound—incised	...	...	...	...	1	...	...	...	...	...	...	...
Phimosis—circumcision	101	...	86	...	6	...	...	1	...	...	...	...
Phimosis	...	...	...	...	1	...	...	...	...	...	...	...
Paraphimosis—do.	...	...	6	...	...	...	...	...	...	...	...	...
Scrotum, elephantoid—radical cure	3	...	...	...	...	...	...	...	...	...	...	...
Do. abscess—incised, drained	4	...	...	...	...	...	...	...	...	...	...	...
Prepuce, adherent—retraction	...	...	1	...	...	...	...	...	...	...	...	...
Do. ulcer—circumcision	...	...	10	...	...	...	...	...	...	...	...	...
Penis, chancre—circumcision	...	...	2	...	...	...	...	...	...	...	...	...
Do. ulcer—do.	...	...	4	...	...	...	...	...	...	...	...	...
Do. ulcer—scraped	...	...	1	...	...	...	...	...	...	...	...	...
Do. gangrene—incised	...	...	2	...	...	...	...	...	...	...	...	...
Do. tumour—removed	1	...	...	...	...	...	...	...	...	...	...	...
Hæmatocele—incised	...	...	2	...	...	...	...	...	...	...	...	...
Granuloma pudendi—scraped	...	...	1	...	...	...	...	...	...	...	...	...
Testicle, undescended—orchidectomy	...	...	...	...	...	...	...	1	...	...	...	...
Lymphangiectasis of cord—removed	1	...	...	...	...	...	...	...	...	...	...	...
<i>Female—</i>												
Amenorrhœa—anaesthetic examination	1	...	...	...	...	...	...	...	...	...	...	...
Dysmenorrhœa—dilatation	7	...	...	...	...	...	...	...	...	...	...	...
Endometritis—dilatation and curettage	1	...	10	...	4	...	...	2	...	...	...	...
Do. septic—curettage	...	...	...	...	1	...	...	...	...	...	...	...
Uterine hæmorrhage—dilatation and curettage	2	...	...	...	...	...	...	...	...	...	...	...
Endocervicitis—cautery	6	...	...	...	...	...	...	...	...	...	...	...
Bartholin's abscess—incised	1	...	...	...	...	...	...	...	...	...	...	...
Tumour of vagina—excised	1	...	...	...	...	...	...	...	...	...	...	...
Prolapse uteri—anterior and posterior colporrhaphy	8	...	...	...	...	...	...	...	...	...	...	...
Cervix uteri—cancer—panhysterectomy	...	...	1	1	...	...	...	...	...	...	...	...
Do. do.—ulcerated—scraped	...	...	1	...	...	...	...	...	...	...	...	...
Uterus—fibroid—sub-total hysterectomy	...	...	3	...	...	...	...	...	...	...	...	...
Cervical fibroid—excised	3	...	...	...	...	...	...	...	...	...	...	...
Cervical polypus—excised	1	...	...	...	...	...	...	...	...	...	...	...
Labia—papilloma—removed	2	...	...	...	...	...	...	...	...	...	...	...
Do. —hypertrophied—removed	...	...	1	...	...	...	...	...	...	...	...	...
Do. —ulcer—scraped	...	...	1	...	...	...	...	...	...	...	...	...
Vulva—wart—excised	...	...	1	...	...	...	...	...	...	...	...	...
Perineum—ruptured—perineorrhaphy	...	...	1	...	...	...	...	...	...	...	...	...
Fistula—paring edge	...	...	...	...	1	...	...	...	...	...	...	...
Abortion, incomplete—removed	3	...	...	...	...	...	...	...	...	...	...	...
Do. do. —curettage	...	...	2	...	...	...	...	...	...	...	...	...
Abortion and hæmorrhage—curettage	...	...	...	...	1	...	...	...	...	...	...	...
Transverse presentation—version manual delivery	...	...	...	...	1	...	...	...	...	...	...	...
Do. do. —embryotomy	...	...	...	...	1	...	...	...	...	...	...	...
Carried forward	1,421	36	429	8	59	...	1	...	9	...	...	...

TABLE 5.—(Continued).

OPERATIONS.	P.H. Georgetown.		P.H. New Amsterdam.		P.H. Suddie.		P.H. Bartica.		P.H. Mabaruma.		P.H. Kamakusa.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Brought forward	1,421	36	429	8	59	...	1	...	9	...	...	...
GENITO-URINARY SYSTEM—Continued.												
<i>Genitalia—</i>												
<i>Female—(Contd.)</i>												
Transverse presentation—internal podalic version	...	...	...	...	1	...	...	...	...	...	...	...
Do. do. —examination	...	...	...	...	1	...	...	...	...	...	...	...
Do. do. —impacted shoulder—forceps delivery	...	...	...	...	1	...	...	...	...	...	...	...
Delayed labour—forceps applied	...	...	...	...	1	...	...	...	...	...	...	...
Difficult labour—occipito posterior—forceps applied	...	...	...	...	1	...	...	...	...	...	...	...
Footling presentation—forceps delivery	...	...	1	...	...	...	...	...	...	...	...	...
Retained placenta—removed	...	...	...	...	1	...	...	...	1	...	...	...
Total	1,421	36	430	8	65	...	1	...	10	...	...	...
MISCELLANEOUS.												
A.—Injections, Syphilis	17,813	...	1,345	...	208	...	282	...	1,023	...	...	...
B.— Do. Yaws	10	...	3	...	26	...	...	...	191	...	...	...
C.—Extractions, Dental	7,409	...	125	...	285	...	75	...	202	...	8	...
D.—Operations, Minor	1,358	...	2,946	...	257	...	101	...	34	...	32	...
E.—Injections, Gonorrhoea	732	...	...	...	...	...	...	...	...	...	...	...
GRAND TOTAL	28,743	36	4,849	8	841	...	459	...	1,460	...	40	...

PUBLIC DISPENSARIES.

133. Out-patient Dispensaries are attached to each of the Public Hospitals in Georgetown, New Amsterdam, Suddie, Bartica, Mabaruma, Kamakusa and Potaro.

134. There is besides in the City of Georgetown a Government public dispensary at Charles Street.

135. Consequent on the closing of the estate hospital at Plantation Hampton Court during the year and the removal of the resident Government Medical Officer from Anna Regina District, a dispensary was established in this district on 29th July. This dispensary besides serving the needs of the public in a populous district is conveniently situated for the inhabitants of the Government Settlement at Bush Lot.

136. There are now eleven Government dispensaries in the charge of qualified dispensers situated in the more remote and populous river districts and in the Diamond and Gold-fields.

137. The following Table gives the number of cases treated, with expenditure and revenue :—

	Paying Patients.			Police Patients.			Pauper Patients.			Expenditure.	Revenue.
	New Cases.	Repeats.	Total.	New Cases.	Repeats.	Total.	New Cases.	Repeats.	Total.		
No. 1 Charles Street ...	8,001	1,976	9,977	...	...	...	6,734	1,282	8,016	\$ 1,839 76	\$ 2,634 48
Leguan ...	1,152	79	1,231	60	11	71	194	26	220	645 45	321 96
Demerara River (Christianburg) ...	539	72	611	22	3	25	688	19	707	981 68	246 13
Berbice River (Ida Sabina) ...	125	16	141	...	...	...	471	62	533	1,005 46	53 70
Pomeroon River (Charity) ...	653	268	921	14	...	14	3,257	689	3,946	1,340 34	390 44
Essequibo River (Supenaam) ...	490	78	568	...	...	...	560	125	685	1,545 10	259 68
Meruca River (Acquero) ...	9	...	9	...	...	...	1,398	68	1,466	1,297 93	3 20
Caval No. 2 Polder ...	884	49	933	...	...	...	22	4	26	769 22	124 64
Mara ...	155	27	180	50	14	64	4,199	1,460	5,659	1,457 18	478 82
Enachu ...	48	4	52	10	...	10	1,957	141	2,098	+	53 00
Wakenaam ...	783	519	1,302	27	11	38	252	168	420	1,069 38	336 98
Anna Regia* ...	61	5	66	23	4	27	1,250	406	1,656	318 49	20 14

* Figures are for period 1st August to 31st December, 1931.

† Supplies are obtained from Public Hospital, Kamakusa.

138. Free medicines were supplied to a number of Aboriginal Indian Mission Stations at a cost of \$80.60

V.—MENTAL HOSPITAL.

139. This hospital is situated in the county of Berbice and has accommodation for 769 patients—448 males and 321 females.

140. The staff consists of :—

- 1 Medical Superintendent.
- 1 Senior Medical Officer.
- 1 Junior Medical Officer.
- 1 Steward.
- 1 Matron.
- 2 Clerks.
- 1 Issuer.
- 1 Dispenser.
- 1 Chief Male Attendant.
- 56 Male Attendants.
- 30 Female Attendants.
- 1 Engineer.
- 3 Cooks and Bakers.
- 1 Butcher.
- 1 Gateman.
- 1 Store Porter.
- 1 Night Watchman.
- 1 Organist.

141. The daily average number of patients was 757 (males 426, females 331), as against 755 in 1930.

142. There were 83 admissions (males 46, females 37) as against 98 in 1930, making with the 755 patients (430 males, 325 females) remaining on January 1st a total of 838 treated during the year.

143. The admissions from the three counties were:—

County.	Males.	Females.	Total.
Demerara	33	31	64
Berbice	7	3	10
Essequibo	6	3	9
Total	46	37	83

144. The admissions classified as to countries of origin were:—

Country.	Males.	Females.	Total.
British Guiana	35	30	65
India	8	4	12
Barbados	2	2	4
Palestine	1	1	2
St. Lucia	1	1	2
Total	46	37	83

145. A fair number of patients from outside the Colony still continue to be admitted, viz., 7.22% of the total admissions.

146. The patients classified under India (14.45% of the total admissions) originally came to the Colony as immigrants and have been domiciled in the Colony for several years.

147. The contributory factors associated with admissions were:—

Contributory Factors.	Males.	Females.	Total.
Poverty and want	15	17	32
Domestic worries	9	10	19
Recurrence	5	2	7
Parturition	1	1	2
Epilepsy	1	1	2
Adolescence	4	1	5
Irregular Life	1	1	2
Congenital	1	1	2
Syphilis	3	2	5
Vice and Criminal Taint	2	...	2
Heredity	1	...	1
Not insane	5	1	6
Total	46	37	83

148. These factors and the numbers under the various headings remain fairly constant. Poverty and want and domestic worries again account for over 50% of the total admissions. Recurrence this year accounts for only half the number of that in 1930—8.43% of the total admissions—as against 15.3%. Syphilis appears as a cause this year in 6.02% of the total admissions.

149. The chief types of unsoundness of mind were: Delusional Insanity—26; Melancholia—7; Adolescent Insanity—5; Syphilitic Insanity—5; Dementia of various forms including Senile Dementia—16.

150. There were 33 discharges (males 22, females 11) as against 26 in 1930, and the total number of patients under treatment at the end of the year was 2 less than at the end of 1930.

151. The total number of recoveries was 33—7 more than in 1930. Out of 46

males and 37 females admitted, 10 males and 2 females were discharged—14.45% of recoveries as against 12.24 per cent. in 1930.

152. The number of deaths was 52 (34 males and 18 females) as compared with 47 in 1930, and the mortality rate was 6.21% as against 5.67% in 1930.

153. Out of the 83 admissions 11 died within one year of admission—8 males and 3 females, *i.e.*, 13.25% of the total admissions.

154. From the above figures it will be seen that the number of male patients has decreased by 10 and that the female patients have been increased by 8 as compared with the end of 1930. Although the number of male admissions is greater than the female admissions there were more male deaths and more male discharges. The deaths and discharges of males were practically double those of females—so that as compared with previous years the proportion of female patients to males is increasing. The disparity lies amongst the East Indians, there being 162 males to 76 females.

155. The chief diseases treated were Malaria, Dysentery, Pulmonary Tuberculosis, Syphilis (Chronic), Chronic Nephritis, Filariasis and Debility.

156. The principal causes of death were General Debility, Malaria and Tuberculosis.

157. The expenditure for the year was \$71,041.34 as compared with \$74,985.18 in 1930 and the revenue \$2,469.58 as compared with \$2,215.63 in 1930.

158. The per caput cost per diem was 25.1 cents as against 26.5 cents in 1930.

159. The value of inmate labour in such occupations as Baking, Gardening, Tailoring, Shoemaking, Washing, Printing, Carpentry, Woodcutting, etc., was estimated at \$16,943.48 as compared with \$15,014.32 in 1930.

160. The Table below furnishes the accommodation in the various wards of the Hospital with classification as to type of patient:—

Division.	No.	Name of Block.	Accommodation.		Class of Patients.
			Authorised.	Actual Number of Patients Treated.	
Male	448	"A" ...	23	22	Trusted.
		B and C and Single Rooms ...	82	99*	Dangerous and Refractory.
		D Lower ...	71	68	Chronic Creole.
		D Upper ...	74	67	Chronic East Indian.
		E Lower ...	38	37	Quiet East Indian.
		E Upper ...	41	39	Quiet East Indian.
		F ...	31	27	Dirty and Doubtful.
		G Male Infirmary ...	55	48	Sick and Infirm.
		Criminal Annexe ...	33	12 419	Criminal.
Female	321	Victoria "A" ...	67	70	Chronic Creole.
		Victoria "B" ...	66	65	Chronic East Indian.
		Single Rooms ...	28	27	Dangerous and Dirty.
		Central Block ...	81	160	Doubtful and Dirty.
		Female Infirmary ...	54	47+	Sick and Infirm.
		Dress (Cottage) ...	25	25 334	Convalescent and Trusted.
			769	763	

* 17 of these sleeping in the Criminal Annexe making the numbers there 29.

+ One small boy included here. He has to be added to the male division making that 420, and deducted from the female making that 333.

161. Accommodation generally throughout the Mental Hospital is inadequate. This is particularly the case in the Refractory Wards in both divisions of the Hospital, more particularly in the female division where the ward is dangerously overcrowded. On the male side a little relief is obtained by using the Criminal Annexe. More single rooms are badly needed for both male and female patients.

VI.—PRISONS.

162. By Order-in-Council dated 23rd June, 1930, His Majesty's Penal Settle-

ment ceased to be a prison as from 31st May, 1930. Although this Prison was officially closed and the majority of prisoners transferred to the Georgetown Prison a nucleus of prisoners, subsequently supplemented by a further number from Georgetown, was retained at the Settlement for the purpose of carrying out bonification work in connection with the establishment in that locality of the headquarters of the Forestry Department.

163. The general health of the prisoners in the Penal Settlement and the Georgetown and New Amsterdam Prisons has been good. There was no epidemic disease during the year.

164. Food and diet scales, milk and water supplies were satisfactory.

165. The daily average number of convicts and prisoners was 300.

166. The following Table shows the number of patients treated in prison hospitals during the year:—

Number remaining in hospital on 31st December, 1930 ...	1
Number admitted to hospital during the year ...	273
Number discharged from hospital during the year ...	253
Number died in Prison hospital ...	3
Number transferred to public hospitals ...	13
Number remaining in hospital on 31st December, 1931 ...	5

167. The principal diseases treated were Malaria and Influenza.

168. The number of out-patients treated was 5,623 as against 6,013 in 1930.

169. There were two executions during the year.

VII.—MINING—MAZARUNI DIAMOND FIELDS.

170. The resident medical staff consists of:—

- 1 Senior Dispenser.
- 2 Junior Dispensers.
- 1 Cook.
- 1 Scavenger.
- 1 Mechanic for motor engine.
- 2 Boathands.

171. The hospital of eight beds, with a dispensary, is situated at the headquarters station at Kamakusa.

172. An out-station dispensary under the charge of a dispenser is maintained at Enachu.

173. The senior and junior dispensers make routine tours of inspection of the district.

174. The average number of the mining population during the year was approximately 2,121, as against 3,050 in 1930.

175. During the year there was a marked decline in mining activities owing to the fall in prices which resulted in a marked decrease in the number of labourers engaged in this industry. As a further sequel there was a high sickness rate due to influenza and dysentery, and conditions became so serious that special relief measures had to be provided by Government. With the exception of this period, health conditions in the district were fair, the most prevalent diseases being Malaria and Bronchitis.

176. The number of venereal diseases cases treated was small—the majority gave evidence of having been infected outside the diamond fields area.

177. The rainfall in the district was:—

Inches 118.02 as compared with
Inches 126.36 in 1930.

178. During the year 53 deaths were registered in the district—17 in hospital and 36 elsewhere—as against 77 in 1930. The causes were:—

Malaria	...	...	...	12
Pneumonia	...	...	...	11
Influenza	...	...	...	8
Dysentery and Enteritis	...	...	...	6
Blackwater Fever	...	...	...	1
Other causes	...	...	...	15

VIII.—SUGAR ESTATES.

179. The total number of these estates is 32. Of these 25 provide and maintain their own hospitals and dispensaries for the benefit of their labour forces and employ their own dispensers and midwives.

180. During the year on instructions from His Excellency the Governor a special inspection of all the sugar estates in the Colony was undertaken by the Surgeon-General and the Government Medical Officer of Health. As a result of this inspection a detailed report was submitted for the information of His Excellency which dealt with health conditions of East Indians on individual estates, and attached to the report was a general summary of vital statistics and recommendations for improving health conditions of labour forces on these estates.

181. The general health of labourers was satisfactory and improvement in vital statistics is being maintained.

182. The following Table shows the births and deaths of the 25 estates with Hospitals:—

RETURN OF BIRTHS AND DEATHS ON SUGAR ESTATES—1931.

NAME OF ESTATE.	POPULATION.			BIRTHS.		STILL-BIRTHS.		DEATHS.		
	East Indians.	Others.	Total.	East Indians.	Others.	East Indians.	Others.	East Indians.	Others.	Non-resident.
Skeldon	1,566	546	2,112	59	23	4	1	29	13	16
Springlands	459	...	459	18	4	1	...	7	...	5
Port Mourant	5,235	329	5,564	211	12	9	1	88	4	10
Albion	5,353	294	5,647	211	5	5	...	61	3	4
Rosehall	3,044	358	3,402	111	14	2	1	71	5	5
Providence, Berbice	476	192	678	8	1	...	3	13	1	3
Mara	242	130	372	6	7	1	...	11	5	8
Blairmont	1,893	277	2,170	53	2	3	...	52	2	4
Bath	1,616	81	1,727	56	4	2	...	35	1	8
Cane Grove	1,390	138	1,468	48	4	4	...	24	...	3
Enmore	2,274	529	2,803	63	14	3	1	43	9	6
Nonpareil	2,096	499	2,595	63	11	6	1	44	9	4
Lusignan	3,130	695	3,834	76	9	9	1	68	7	12
Mon Repos	...	...	...	13	3	...	1	10	3	2
La Bonne Intention	1,935	50	1,985	76	2	5	...	45	3	2
Vryheid's Lust	1,233	162	1,395	47	7	6	...	27	4	2
Ogle	1,897	285	2,182	69	11	5	...	53	6	3
Diamond	2,793	1,288	4,081	65	14	8	...	38	2	21
Farm	1,180	436	1,616	42	7	7	...	21	1	6
Providence, Demerara	2,349	449	2,798	79	3	6	...	36	3	19
Wales (including Schoonerd)	1,689	474	2,163	30	14	4	1	33	6	9
Versailles	590	36	636	30	11	3	2	5	...	15
Leonora	3,132	279	3,411	109	...	9	...	44	...	4
Uitvlugt	4,545	710	5,255	131	12	9	...	47	8	1
De Kinderen	1,354	413	1,767	41	11	5	3	18	9	9
Total	51,390	8,470	59,860	1,715	205	116	16	923	104	172

183. There were 1,920 births of resident estate population as against 2,152 in 1930, and the deaths of resident estate population numbered 1,027 as against 997 in 1930.

184. The total number of deaths of the resident estate population, adding to the above totals the number of deaths occurring in public hospitals, was 1,121 as against 1,069 in 1930.

185. The birth rate, death rate and infantile mortality of the resident estate population were 32.0 17.1 and 130, respectively as compared with 35.7 16.5 and 128 for the year 1930.

186. Housing conditions continue to be improved though somewhat slowly and with grants made from the Colonial Development Fund most estates have improved their housing by the erection of well-designed cottages housing one or two families. In the absence of such a grant, in view of the general economic depression in the sugar industry owing to the slump in prices, progress in this direction will be slow. Otherwise on the better managed estates sanitation has been maintained.

187. In view of the high infant mortality on estates which has been brought to the notice of the Estates Authorities greater efforts have been made with a view to decreasing this mortality and most estates have now been affiliated with the Colony Branch of the Infant Welfare and Maternity League and are working on lines similar to the League's with the aim and object of concentrating on the care and preservation of infant and child life.

IX.—ALMS HOUSE.

188. Dr. O. M. Francis assumed duty as Medical Officer, *vice* Dr. Boyce, on 1st April.

189. Accommodation is provided for 808 inmates—514 males and 294 females.

190. The number of cases admitted to the infirmary wards was 1,550.

191. The deaths numbered 219—109 males and 110 females—the death-rate being 17.21 per cent. of the total number of inmates as compared with 14.72 per cent. in 1930.

192. The chief causes of death were:—Senility, Hemiplegia, Chronic Nephritis, General Debility, Myocarditis, and Chronic Endocarditis.

193. The number of minor operations performed was 321—169 males and 152 females.

194. Twenty-nine injections of tartar emetic were given, 187 intravenous injections of novarsenobillon and 6 injections of ametox.

195. The number of inmates remaining in the institution on the 31st December, 1931, was 830—512 males and 318 females—and the chief causes of detention were Senility, Ulcers, General Debility, Hemiplegia, Blindness and Paralysis.

196. The following Table shows the admissions, deaths, etc., for the last ten years:—

(1) Year.	(2) Total Deaths.	(3) Total persons in Alms House during the year.	(4) Death-rate per cent.	(5) Number of cases of Diarrhoea.	(6) Number of cases of Dysentery.	(7) Number of deaths from Diarrhoea and Dysentery.
1922	655	2,793	23.4	589	91	185
1923	483	2,346	20.5	482	37	122
1924	353	1,783	19.8	291	26	60
1925	430	2,044	21.03	273	31	60
1926	375	1,829	20.5	350	40	74
1927	324	1,591	20.4	224	40	31
1928	338	1,698	21.02	260	53	44
1929	286	1,429	20.01	148	69	38
1930	203	1,379	14.72	54	19	6
1931	219	1,272	17.21	62	6	4

General Remarks.

197. This institution, like the larger public hospitals, has suffered from overcrowding during the year, the congestion on the female side being particularly noticeable.

X.—ONDERNEEMING INDUSTRIAL SCHOOL.

198. The report of the Medical Officer is published with the report of the Superintendent.

199. The following Table shows the statistical figures for the years 1929, 1930 and 1931 :—

	1929.	1930.	1931.
Daily average number of boys in school ...	126	128	126
Daily average number of boys sick	8	6	6
Percentage of sick to daily average number of boys ...	7	4	5
Percentage of ancylostome infection during the year...	3	2	26

200. 212 boys were treated in the infirmary during the year, and there were no deaths.

201. There were 24 admissions into the school during the year. These boys in accordance with custom, were examined for Ancylostomiasis and Filariasis, but none of them was found to be infected with either disease. Three of these boys were treated for malaria—one from the day of admission; in the case of the second and third the onset of the disease coming 8 months and 5 months respectively after admission.

202. Thirty-two boys were treated for malaria; of these 30 had one attack and 2 had two attacks.

203. Twelve cases of abscesses were treated surgically. 24 boys were vaccinated against small-pox (all successful) and one boy received a prophylactic dose of anti-tetanic serum.

204. During the month of July an epidemic of ulcers broke out among the boys. These ulcers originated from minor injuries received while working in the farm and workshop, which subsequently became infected. The situation was taken in hand with the result that by the middle of October there were no more than 4 boys under treatment. Apart from this epidemic, the health of the boys was satisfactory on the whole.

XI.—MATERNITY AND CHILD WELFARE.

205. The report of the British Guiana Infant Welfare and Maternity League founded in 1914 is published separately and may be had on application to the Secretary.

206. The Government grants the League annually, as a subvention, a sum of \$12,062 which is allocated as follows :—

For Midwives (Subsidies) ...	\$ 8,616
For General Purposes ...	2,846
For Inspector of Midwives ...	600
	\$12,062

207. There are maternity wards in each of the five principal hospitals of Georgetown, New Amsterdam, Suddie, Mabaruma and Bartica.

208. The accommodation in these hospitals and the maternity returns for the year are as follows :—

	Number of Beds.	Deliveries.	Deaths (Maternal).	No. of Births.	No. of Still-births.
Public Hospital, Georgetown ...	26	816	23	690	99
do. New Amsterdam ...	8	146	8	129	26
do. Suddie ...	12	85	9	67	18
do. Mabaruma ...	1	15	...	14	1
do. Bartica ...	2	12	...	9	3

209. The Maternal Mortality rate in the above Institutions was 4.7 per 1,000 live births.

210. The total number of births registered in the Georgetown Registration District and in the City of Georgetown was 1,726 and 1,533 respectively. Of this number 690 occurred in the Public Hospital, Georgetown.

211. In the country districts there are employed under the auspices of the Infant Welfare and Maternity League, supported principally by Government subsidies, 44 Midwives and three Health Visitors. There is also a Health Visitor in the town of New Amsterdam.

212. Below is a statement of maternity work undertaken by League Midwives during the years 1929-1931:—

	1929.	1930.	1931.
No. of cases undertaken	2,565	2,665	2,568
No. of infants' deaths	103	104	70
No. of still-births	134	115	97
No. of mothers' deaths	11	17	20
Maternal Mortality rate	4.3	6.4	7.8

213. Infant and ante-natal clinics have been regularly conducted by Government Medical Officers in 55 centres as follows:—

Clinic Centre.	Government Medical Officer.	No. Clinics.	ATTENDANCES OF INFANTS.		No. of Infants treated.	* No. Expectant Mothers.	No. Treated.
			Under 1 year.	Over 1 year.			
Kitty	Dr. Q. B. deFreitas	24	800	105	429	16	14
Plaisance	do.	25	441	143	97	16	10
Beterverwagting	do.	26	1,153	179	182	20	20
Buxton	do.	25	1,051	384	178	16	16
Golden Grove	Dr. G. T. G. Boyce	16	306	86	175	...	...
Paradise	do.	11	64	27	47	...	...
Victoria	do.	12	164	46	93	2	2
Ann's Grove	do.	12	185	2	87	...	...
Unity	do.	5	35	...	28	...	...
Mahaica	do.	12	105	52	40	...	...
Supply	do.	11	56	23	28	...	...
Rosignol	Dr. J. E. Chow	15	143	21	39	20	6
No. 9 Village	do.	15	154	4	26	13	5
Hopetown	do.	14	58	...	9	3	2
No. 28 Village	do.	15	65	22	25	18	6
New Amsterdam	Dr. G. Carto	75	991	49	313	457	390
Edinburgh Village	do.	18	89	45	43	...	...
Mara	Dr. W. W. Besson	12	61	66	41	17	9
Sandvoort	Dr. G. Carto	11	58	35	29	...	...
Adelphi	do.	12	147	47	21	...	...
New Forest	do.	12	59	54	17	...	...
Sheet Anchor	do.	11	98	30	47	...	...
Fyrish	Dr. L. H. Sharples	11	74	...	17	72	11
Rose Hall	do.	11	261	2	31	46	15
Auchlyne	do.	12	322	112	77	47	19
Lindair	do.	11	338	2	41	35	5
No. 59 Village	Dr. D. J. Taitt	19	56	29	20	...	...
No. 64 Village	do.	12	66	22	30	...	...
No. 71 Village	do.	11	77	37	50	...	...
No. 78 Village	do.	16	67	40	26	...	...
La Peritence	Dr. J. E. R. Ramdeholl	25	1,076	188	391	128	31
Agricola	do.	26	439	157	214	72	10
Grove	do.	24	138	17	80	9	2
Penderoyen	Dr. J. Neild	19	84	18	21	10	5
Hagotville	do.	12	97	2	23	2	...
No. 1 Canal Polder	do.	15	68	12	24	...	...
Den Amstel	Dr. R. N. Cozier	26	82	16	14	...	...
Windsor Forest	do.	17	65	13	23	3	3
Hague	do.	24	271	99	46	1	1
Bartica	Dr. W. Pollard	24	315	100	51	9	5
Leguan	Dr. R. N. Cozier	23	129	2	44	30	30
Marionville	Dispenser Mitchell	53	206	87	31	2	...
Zeelandia	do.	24	107	59	20	...	...
Aurora & Supensam	Dr. G. Kerry	24	237	110	133	48	13
Riverstown	do.	24	224	107	148	32	25
Suddie	do.	25	179	71	133	39	25
Queenstown	Dr. C. R. Subryan	13	102	6	52	31	17
Danielstown & Henrietta	do.	22	127	24	62	5	1
Bush Lot Settlement	do.	36	210	110	88	41	12
Anna Regina	do.	12	137	...	54	5	4
Pomerooa	do.	6	13	...	3	...	...
Morua	Dispenser Trotman	26	342	85	121	41	4
Morawhanna	Dr. V. V. H. Hoakai	31	92	30	61	11	10
		975	12,325	2,967	4,113	1,277	728

XII.—HYGIENE AND SANITATION.

214. This report refers to the Colony in general, and excludes the Municipal areas of Georgetown and New Amsterdam.

1.—ADMINISTRATIVE.

Staff.

215. The authorised staff of the Department in 1931 was as follows:—

(i) *Headquarter Staff*—

Government Medical Officer of Health, B. N. V. Bailey, M.B., Ch. B. (Edin.),
D.P.H., D.T.M. & H. (Eng.).

Assistant Government Medical Officer of Health—vacant throughout the year.

Head Clerk (Fifth Class) C. A. Lashley (January to
February); C. H. Harewood (March-Dec.).

Second Clerk (Sixth Class) Miss E. Lewis.

Third Clerk (Clerical Assistant) Miss I. Clarke.

In addition, there are two disinfecting assistants, who also act as photographers, draughtsmen and messengers, and carry out duties in connection with experimental work.

(ii) *Sanitary Staff*—

Sanitary Inspectors—Class I.

County of Berbice—F. J. July (Member R. Sanitary I.).

County of Demerara—H. A. Moonsawmy (Member R. Sanitary I.).

County of Essequibo—Vacant—Supervised by County Sanitary Inspector,
Demerara.

2.—ORDINANCES.

216. No new Ordinances were passed during the year.

3.—NOTIFIABLE DISEASES.

217. The notifiable diseases are Small-pox, Alastrim, Yellow Fever, Cholera, Plague, Tuberculosis (all forms), Enteric Fever, Diphtheria, Chicken-pox and Ophthalmia Neonatorum.

218. No cases of Small-pox, Alastrim, Yellow Fever, Cholera or Plague occurred during the year, and there were no special epidemics amongst the notifiable diseases.

219. The total number of cases notified of the remaining diseases for the whole Colony was 786 as compared with 695 in 1930. The deaths registered as due to the same diseases were 348 as against 366 in the previous year.

220. There was a slight increase in the number of cases of Tuberculosis and Enteric Fever in the whole Colony, but otherwise cases and deaths of the notifiable diseases showed a slight decline.

(i) *Tuberculosis (all forms)*—

221. As will be seen from the Table below there was a slight increase in the number of cases but a reduction in the number of deaths for the Colony as a whole.

222. The British Guiana Society for the Prevention and Treatment of Tuberculosis continued its activities as in former years. These activities take the form of (1) Dispensary examination and treatment by Honorary Visiting Physicians and (2) Sanatorium treatment for incipient and convalescent cases, under the supervision of a District Government Medical Officer.

223. Arrangements were made during the year for admissions to Best Hospital to be under the control of the Government Medical Officer of Health and for cases for admission to pass through the Tuberculosis Dispensary in Georgetown, thus

avoiding the former necessity of patients first having to be admitted to the Public Hospital, Georgetown, for transference to Best Hospital.

224. The Twenty-fifth Annual Report being the Jubilee Report of the Society has been held over until October, 1932, when it is proposed to hold special meetings during a Health Week as well as the Annual Meeting of the Society.

225. The Government Medical Officer of Health continued to serve as an Honorary Visiting Physician.

226. Below is a Table showing the cases notified and deaths registered in the City of Georgetown, the remainder of the Colony and the Colony as a whole, for the past ten years. These are compared with the cases and deaths of In-Patients of the Public Hospitals, the average ten-year case mortality also being given :—

TUBERCULOSIS (ALL FORMS).
CASES NOTIFIED AND DEATHS REGISTERED.

	City of Georgetown.		Remainder of Colony.		Whole Colony.		Public Hospitals In-Patients.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1922 ...	176	121	279	266	455	387	327	108
1923 ...	161	120	298	274	459	394	350	127
1924 ...	184	101	259	243	433	344	290	121
1925 ...	162	95	263	254	425	349	385	141
1926 ...	124	100	195	226	319	326	371	133
1927 ...	116	93	173	252	289	345	388	139
1928 ...	102	76	190	225	292	301	357	122
1929 ...	97	61	230	215	327	276	368	127
1930 ...	122	85	209	217	331	302	383	143
1931 ...	140	78	242	209	382	287	453	164
Totals ...	1,384	930	2,348	2,381	3,732	3,311	3,672	1,325
Average (10-year) Case Mortality.	67.2%		101.4%		88.7%		36.1%	

227. The number of cases from all forms of this disease has tended to increase during the past five years. On the other hand the number of deaths during this period has declined. An increase, however, is revealed in the deaths occurring in Public Hospitals, resulting in a slight rise in the case mortality. The general inference would appear to be that more patients are annually coming forward for examination and treatment. The continued economic depression throughout the colony is also probably reflected in the figures.

(ii) *Enteric Fever.*—

228. Below is a Table showing the cases notified and deaths registered in the City of Georgetown, the remainder of the Colony and the Colony as a whole for the past ten years. These are compared with the cases and deaths of In-Patients of the Public Hospitals, the average ten-year case mortality also being given :—

ENTERIC FEVER.
CASES NOTIFIED AND DEATHS REGISTERED.

	City of Georgetown.		Remainder of Colony.		Whole Colony.		Public Hospitals In-Patients.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1922 ...	135	29	305	63	440	92	231	63
1923 ...	168	49	296	77	464	117	292	89
1924 ...	158	32	255	57	413	89	229	56
1925 ...	80	16	234	63	314	79	148	40
1926 ...	103	16	297	86	400	102	235	58
1927 ...	67	16	196	74	263	90	143	49
1928 ...	55	14	169	44	224	58	114	31
1929 ...	43	11	157	33	200	44	91	24
1930 ...	24	7	220	46	244	53	124	29
1931 ...	18	5	232	47	250	52	94	23
Totals ...	851	186	2,261	590	3,212	776	1,751	462
Average (10-year) Case Mortality.	21.9%		26.0%		24.2%		26.4%	

229. The figures for the City of Georgetown continue to show a decline both in the number of cases and in the number of deaths as also the cases and deaths received into or occurring in the Public Hospitals.

(iii) *Diphtheria.*—

230. There was a slight over-all reduction in the number of cases and deaths throughout the Colony, but as will be seen the figures remain much the same year by year.

231. Below is a Table showing the cases notified and deaths registered in the City of Georgetown, the remainder of the Colony and the Colony as a whole, for the past ten years. These are compared with the cases and deaths of In-Patients of the Public Hospitals, the average ten-year mortality also being given :—

DIPHTHERIA.
CASES NOTIFIED AND DEATHS REGISTERED.

	City of Georgetown.		Remainder of Colony.		Whole Colony.		Public Hospitals In-Patients.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1922 ...	14	3	13	4	27	7	25	7
1923 ...	10	4	20	2	30	6	30	6
1924 ...	9	2	5	...	14	2	14	2
1925 ...	47	7	14	6	61	13	29	8
1926 ...	28	8	7	...	35	8	22	2
1927 ...	13	2	17	13	30	15	21	11
1928 ...	21	9	14	11	35	20	16	9
1929 ...	18	4	8	6	26	10	15	6
1930 ...	18	4	20	7	38	11	21	7
1931 ...	19	2	17	7	36	9	13	6
Totals ...	197	45	135	66	332	101	206	64
Average (10-year) Case Mortality.	22.8%		41.5%		30.4%		31.1%	

(iv) *Chicken-Pox.*—

232. No deaths were recorded from this disease throughout the colony. An appreciable increase in the number of cases occurred in the City of Georgetown and this increase was reflected in cases admitted to Public Hospitals. On the other hand there was a marked reduction in the number of cases in the remainder of the Colony.

233. Below is a Table showing the cases notified and deaths registered in the City of Georgetown, the remainder of the Colony and the Colony as a whole, for the past ten years. These are compared with the cases and deaths of In-Patients of the Public Hospitals, the average ten-year case mortality also being given :—

CHICKEN-POX.
CASES NOTIFIED AND DEATHS REGISTERED.

	City of Georgetown.		Remainder of Colony.		Whole Colony.		Public Hospitals In-Patients.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1922 ...	25	...	43	...	68	...	17	...
1923 ...	8	...	21	...	29	...	7	...
1924 ...	23	1	77	...	100	1	8	1
1925 ...	72	...	24	...	96	...	31	...
1926 ...	29	...	30	...	119	...	18	...
1927 ...	14	...	17	...	31	...	5	...
1928 ...	7	1	44	...	51	1	11	...
1929 ...	9	...	41	...	50	...	14	...
1930 ...	25	...	49	...	74	...	22	...
1931 ...	52	...	18	...	70	...	55	...
Totals ...	264	2	424	...	688	2	188	1
Average (10-year) Case Mortality.	0.8%		0.0%		0.3%		0.5%	

(v) *Ophthalmia Neonatorum.*—

234. Below is a Table showing the cases notified in the City of Georgetown, the remainder of the Colony and the Colony as a whole from November, 1930, to December, 1931 :—

OPHTHALMIA NEONATORUM.			
CASES NOTIFIED.			
(Notification commenced November, 1930).			
	City of Georgetown.	Remainder of Colony.	Whole Colony.
	Cases.	Cases.	Cases.
1930 (Nov.-Dec.) ...	3	5	8
1931 ...	36	12	48
Totals ...	39	17	56

4.—GENERAL PREVENTIVE MEASURES.

235. The usual Tables showing in detail the work of the District Sanitary Inspectors are appended.

236. Of specified sanitary improvements carried out there were 52,479 as compared with 47,421 in the previous year. Cases taken to Court numbered 995 ; of these 83 were withdrawn, the number of convictions obtained being 902.

(i) *Latrine Erection.*—

237. The policy of erecting dry pit latrines in Village, Country and Rural Districts was continued during the year. The total number of this type of latrines erected in 1931 was 2,417 apart from the conversion of old and less satisfactory types. Where possible the septic tank system of conservancy is recommended. During the year this system was introduced on sugar estates. While the initial cost of the erection is considerably higher, the permanency, the general efficiency and the appearance have collectively encouraged a few Estate proprietors to adopt this system.

(ii) *Lot Inspection.*—

238. Routine activities of the District Sanitary Inspectors under this head were continued throughout the year. Owing to the shortage of staff prevailing some of the districts had to be extended, thus somewhat limiting the completeness and frequency of the periodical inspection. Stress was laid on the need for the screening of water receptacles together with the maintenance in a sanitary condition of interlot drains and the removal of excess bush and vegetation. Owners of lots are especially advised as to the importance of filling in irregularities in the surface of the ground and generally the proper levelling and grading of the land to the adjacent drains. Attention was paid by Sanitary Inspectors to the condition of the guttering of dwelling-houses as this forms a most prolific source of breeding, chiefly of the *Aedes* mosquito.

(iii) *Refuse Disposal.*—

239. No special arrangements exist at present in Village, Country and Rural Sanitary Districts for the proper disposal of refuse, and until such time as Local Authorities are able to provide or to contract for systematic collection and destruction or burial of house refuse the policy continued by the Department must remain that of encouraging burying or burning by individual occupiers.

(iv) *Food Inspection and Sampling.*—

240. Shops are regularly visited and foodstuffs inspected. Table IV. reveals that of 200,728 samples examined, 1,022 were condemned as unfit for use for human consumption.

241. Milk samples were taken at intervals in the different districts and submitted to the Government Analyst for examination. Out of 1,513 samples taken, 103 were found to be adulterated. These figures compare favourably with those for the preceding year which were 1,285 samples with 136 adulterations.

242. Routine examination of Slaughter-houses was carried out by Sanitary Inspectors wherever such exist, as also wherever slaughtering occurred. The chief causes for condemnation of carcasses and portions of carcasses were Tuberculosis and Parasitic Infection of individual organs. The number of carcasses inspected was 5,504 of which 19 were wholly condemned and 1,431 portions of one or another were found unsound and destroyed.

(v) *Buildings.*—

243. Continued difficulty was experienced in enforcing the existing provisions of the law in respect to this important subject. A working policy has in the meanwhile been introduced pending the passing of the new Public Health Ordinance, and this has had the effect of tightening up conditions in respect to the preparation and laying out of land prior to the actual building. Until, however, the importance of this aspect of sanitation is fully realised, effective measures directed towards the control of house-lots generally cannot be carried out. Greater regard in this connection is similarly being paid to the front lands of Sugar Estates.

(vi) *Water Supply.*—

244. The gradual extension and in places the renovation of the Artesian Well system in the more populous districts of the colony must be regarded as highly satisfactory. It is interesting in view of this to note the steady and marked decline in diseases and deaths classified under the general heading of Diarrhoea and Enteritis; on the other hand the general absence of any protective measures directed against surface contamination of fresh water trenches, the use of which is so widespread for drinking and domestic purposes, remains an unsatisfactory feature.

(vii) *Disinfection.*—

245. On the receipt of the notification form from the District Medical Officer of any of the notifiable diseases (with the exception of Ophthalmia Neonatorum) the Sanitary Inspector of the District concerned is immediately informed by telegram, and measures for the disinfection of the premises are promptly carried out.

(viii) *Vaccination.*—

246. Public vaccinators appointed in various parts of the colony continued to vaccinate cases brought to them. Vaccination Officers are appointed for this purpose. The following Table shows the number of vaccinations performed:—

	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Total Vaccinations	...	...	...	5,150	6,862	4,241	6,668	6,500	4,864	5,179
Total verified successful	6,826	6,113	3,905	4,671	6,208	3,610	5,311	5,814	4,777	4,778
Per cent. verified successful	...	...	...	90.7	90.4	85.1	88.6	89.6	98.2	92.3

5.—SPECIAL PREVENTIVE MEASURES.

(i) *Anti-malarial Measures.*—

247.—(a) The programme of bonification of the Thomas Lands to the north and east of Georgetown was continued throughout the year. Progress, however, was necessarily slow owing to still further reduction in the vote allotted to this work. Paid labourers are employed when possible, but otherwise this work is undertaken by convict labour under the supervision of the Department.

(b) A section of land in the neighbourhood of Queen's College, Georgetown, viz., a portion of the D'Urban Park Race Course, was bonified during the year.

(c) The special measures commenced in 1929 at the Mazaruni Station (His Majesty's Penal Settlement) were continued throughout the year. A larger contingent of convicts was provided from Georgetown for this work. These, amounting in number to some fifty to sixty, cleared, levelled and graded a considerable area of the land adjacent to and surrounding existing buildings. Evidence of an over-all reduction in mosquito incidence was noted in the last quarterly report of the Government Medical Officer resident at the Station, and although Malaria Fever continued to be reported an appreciable reduction in the number of cases was noted in the returns.

(ii) *Model Dry Pit Latrines.*—

248. The policy of erecting the Departmental type of dry pit latrines in Police Stations, Schools, etc., was continued, but owing to a still further reduction in the sum of money allotted for Approved Sanitary Works of this nature the number erected was less than the previous year. There still remains in many Government Institutions and Officers' Quarters an unsatisfactory and antiquated bucket system of conservancy. It is hoped that the policy of substituting the septic tank or, where this is impossible, the dry pit system, will be proceeded with as early as possible.

249. Under the supervision of the Department a section of the Race Course in New Amsterdam was levelled and graded, thus eliminating many areas which formed an ideal breeding ground for the anopheline mosquito.

(iii) *Education and Propaganda.*—

250.—(a) A course of lectures in connection with the local examination for Sanitary Inspectors' and Women Health Visitors' Certificates was given, the examination being held later in the year.

It was not found practicable to hold the usual Refresher Course for District Sanitary Inspectors during the year.

(b) The examination for the Royal Sanitary Institute's Certificates for Sanitary Inspectors and Women Health Visitors was held in Trinidad, the Government Medical Officer of Health being one of the examiners. One Sanitary Inspector and two Health Visitors from this Colony obtained certificates.

(c) The Government Medical Officer of Health continued to give weekly lectures in Hygiene and Sanitation to Student Teachers of the Teachers' Training Centre of the Education Department.

(d) A Health Section was arranged at an Exhibition held on the grounds of the Georgetown Cricket Club on the occasion of the Centenary Celebrations of the Colony in October, the demonstrations being grouped under the following subjects:—Maternity and Child Welfare, Anti-malarial measures, Disinfection, Insect Parasites, Pure Water Supplies, Pure Food and the Vitamin containing Foodstuffs; and General Sanitation, including Sanitary Appliances.

(e) The Chief Engineer for the Municipal Sewerage and Water Commissioners, Mr. I. M. E. Aitken, also arranged in conjunction with the Health Exhibition a model demonstration of the Sedimentation and Filtration Plant for the clarification and purification of Lamaha (creek) water, and the Medical Superintendent of the Leprosy Hospital illustrated in a separate kiosk the varying phases of Leprosy, and methods of treatment.

(f) A new "Health Series" of pamphlets was initiated by the Department at this Exhibition, the subjects dealt with being Malaria and Tuberculosis. These were freely distributed to visitors.

6.—NEW PUBLIC HEALTH BILL.

251. The drafting of a new Bill "to promote the Public Health of the Colony" was continued throughout the year.

7.—LABORATORY WORK.

252. No increase in staff over the previous year was available, the laboratory work being carried out by a part-time assistant under the supervision of the Government Medical Officer of Health. During the major portion of the year, the assistant, a Class III Sanitary Inspector, Mr. S. D. Singh, was appointed to a district in the neighbourhood of Georgetown to act as Sanitary Inspector owing to temporary staff shortage. No extension of laboratory work was therefore possible during the year and, in fact, the usual investigations, such as those for Malaria and Hookworm, had unavoidably to be held over.

253. Arrangements were made with the Society for the Prevention and Treatment of Tuberculosis to undertake the routine examination of specimens of sputa.

254. A total of 200 specimens in all were examined during the year.

- 107 specimens of sputa were submitted, of which eighteen showed the presence of acid-fast organisms;
- 69 blood films were submitted, of which two showed the presence of the sub-tertian parasites of malaria;
- 22 were water samples; and
- 2 were specimens of stools submitted for the presence of parasitic worms or ova; one of these showed the presence of *Ascaris* only.

(i) *Water Analysis.*—

255. Of the 22 samples examined, 11 were of creek water, 10 were of rain water, and one of ordinary trench water.

256. The same technique as detailed in the Annual Report for 1929 was employed, but, in addition, three further sugars were added, viz., Adonite, Inosite and Salicin. The addition of these carbohydrates was made with a view to undertaking a more detailed examination of the *B. coli* communior group, this type being by far the most frequently met with as compared with the *B. coli* communis; in fact, in only one sample of the twenty-two examined—a sample of rain water collected from the roof of the Department—was this organism isolated. In all other instances the organism was a member of the Communior group.

ARTESIAN WELL WATER.

257. No specimens of artesian well water were examined during the year.

RAIN WATER.

258. Of the 11 samples tested,

- In 2 cases Coliform organisms were isolated in 1 c.c.
- In 4 cases Coliform organisms were isolated in 5 c.c.
- In 3 cases Coliform organisms were isolated in 10 c.c.
- In 1 case Coliform organisms were isolated in 25 c.c.
- In 1 case Coliform organisms were isolated in 100 c.c.

The last case referred to above was in a sample of water analysed after filtration by the alum and sodium aluminate process, an experimental plant having been installed for the purpose of chemical purification of swimming bath water by Mr. I. M. E. Aitken, Chief Engineer of the Municipal Sewerage and Water Commissioners, for the benefit of a local club.

259. Irregularity in some of the above tests was experienced, more especially in the acid reaction with Andrade's indicator, largely occasioned by the heavy greenish-black deposit which occurred, especially in the larger tubes. This blue-green coloration appeared to be due to the presence of the *Bacillus pycocyaneus* which in some instances was later isolated in pure culture.

260. Generally, the Indol, Voges-proskauer and Methyl Red reactions which were determined in every case confirmed the carbohydrate reactions. *B. aerogenes* was isolated in five out of the 11 samples, and one or other of the members of the *B. coli* communior group was also isolated in five of the samples. Of these, *Bacillus metacoli* (Castellani, 1915) and *Bacillus oxytocus perniciosus* (Mysookowitsch) were the most frequent. Not infrequently lactose showed late fermentation (72-96 hours). There was some variation in the carbohydrate readings, especially after repeated sub-cultures.

CREEK WATER.

261. Creek (Lamaha) water being supplied through pipes to the Department for general use, it was decided to take samples monthly with a view to ascertaining the wet and dry seasonal variation in organismal content.

RAIN WATER.

262. Of the 15 samples examined,

2 cases	showed the presence of Coliform organisms in	0.1 c.c.
1 case	"	"
1 case	"	"
1 case	"	"
2 cases	"	"
1 case	"	"
1 case	"	"

263. Again, *B. oxytocus perniciosus* or *B. metacoli* were the most frequent organisms met with. The one case only of the 22 tests in which *B. coli communis* was isolated, as referred to above, is interesting in view of the fact that it was collected from the roof of the Department, this building being one of the highest in Georgetown. On the onset of a shower of rain sterilised flasks were placed so as (1) directly to catch the falling rain and (2) after it had fallen on to the roof and into an iron gutter.

264. *B. coli communis* only was isolated from the former samples while *B. coli communior* only was obtained from the latter. That *B. coli communis* should be found in such rain water uncontaminated by roof or gutter points to the organism having been present in the atmosphere.

TRENCH WATER.

265. One sample was examined, *B. aerogenes* being isolated in .01 c.c. of the sample.

266. In view of many of the tests being private or official requests for analysis, difficulty arose from the outset in deciding whether or not the sample of water should be classed as potable. If the standard of contamination for *B. coli communis* alone be accepted, then 100 per cent. of those samples so analysed must be considered 100 per cent. pure. In view however of the sources of such water and the state in which the receptacles were found, it was thought advisable to consider any sample in which coliform organisms were isolated in 25 c.c. or more with suspicion, and to recommend the receptacle to be emptied and cleansed, or chlorinated.

267. Frequent sub-cultures were made and each tested in the endeavour to isolate the exact type or types of the *B. coli* communior present. Much irregularity

was shown on the tests based on successive sub-cultures. It was found on occasions that sub-cultures had to be repeated many times before purity of type could be guaranteed. These tests will be continued in order to ascertain the commonest types met with in the ordinary drinking and domestic water supplies of this Colony.

(ii) *Entomology.*—

268. The collection and preparation on a small scale of various species of mosquitos, bugs, fleas, lice and other parasites was continued during the year, the addition of a suitable though locally made cabinet being found very serviceable for the successful storage of specimens.

APPENDIX A.

TABLE I.

Inspections of lots.	Notices served.	Prosecutions.	Convictions.	Withdrawn.	Dismissed.	Struck out.	Amount of fines.
129,136	16,042	698	624	69	4	1	\$788.91

TABLE II.

Lots weeded.	Drains weeded.	Drains dug.	Trenches cleaned.	Ponds cleaned.	Water Receptacles screened.
10,864	7,661	1,405	542	867	1,830

TABLE III.

Latrines erected.	Latrines removed and re-erected.	Latrines repaired.	Latrines limewashed.	Cesspits emptied.	Cesspits oiled.
2,417	1,461	2,309	2,420	579	17,399

TABLE IV.

	1930.	1931.
Inspection of provision shops ...	8,774	9,234
Provision shops cleaned by order ...	1,036	1,008
Provision shops certified ...	9	49
Inspection of bakeries ...	1,601	1,706
Bakeries cleaned by order ...	179	260
Bakeries certified ...	4	6
Samples of foodstuffs examined ...	195,031	200,728
Samples of foodstuffs condemned ...	1,051	1,622
Inspection of butcheries ...	2,701	3,657
Carcasses inspected ...	5,023	5,504

TABLE V.

Milk Sampling, Inspection of Cowpens, etc.	1930.	1931.
Cattle-pens certified as sources of milk supply ...	437	411
Licences issued for the sale of milk ...	722	882
Persons medically examined as to fitness for handling milk or milk vessels ...	639	440
Persons prosecuted for selling milk unlawfully ...	67	116
Persons prosecuted for selling adulterated milk ...	126	103
Inspection of cattle-pens ...	7,586	8,373
Cattle-pens cleaned by order ...	671	836

TABLE VI.

RESULTS OF MILK SAMPLING—	1930.	1931.
Samples taken ...	1,285	1,513
Samples genuine ...	1,149	1,400
Samples adulterated ...	136	103
Amount of fines ...	\$ 1,582 50	\$ 1,489 50

TABLE VII.

PERCENTAGE OF ADULTERATED MILK SAMPLES—	1930.	1931.
East Coast, Demerara ...	9.1%	5.9%
West Coast, Demerara ...	18.9%	6.0%
East Bank, Demerara ...	8.9%	10.0%
West Bank, Demerara ...	8.1%	9.0%

XII.—PORT HEALTH WORK AND ADMINISTRATION.

PORT OF GEORGETOWN.

269. The Surgeon-General is the Quarantine Authority for the Colony.

270. The Staff is as follows :—

Health Officer	...	B. N. V. Bailey, M.B. Ch.B. (Edin.), D.P.H., D.T.M. & H. (Eng).
Deputy Health Officers	...	The Government Medical Officers attached to the Public Hospital, Georgetown.
Port Sanitary Inspector	...	J. H. Matthews, (Local Certificate in Hygiene and Sanitation).
Engineer	...	W. Spooner.
Caretaker, Quarantine Station		G. Reid.

271. During the year the duties of the Port Health Officer were performed by Dr. B. N. V. Bailey and in his absence by Government Medical Officers from the Public Hospital, Georgetown.

272. Quarantine was maintained during the year as follows :—

- (a) Permanently against all South and Central American Ports (except British, French and Dutch) for Yellow Fever, Plague, Small-pox and Cholera.
- (b) At different times and for varying periods against Colon, Hayti, Cuba, Tampa, Florida (U.S.A.) and Guatemala for Small-pox; St. Martin's and St. Bart's for Alastrim and the Azores, Porto Rico and San Domingo for Plague.

273. *Vessels visited by the Port Health Officer.*—During the year seventy (70) vessels were visited by the Port Health Officer under the Quarantine Ordinance tabulated as under with fees chargeable in each case.

Month.	Gratis.	\$1.	\$6.50.	\$9.50	\$2. (Revisit).
January	6	2	...	...
February	4	...	...	...
March	8	...	...	...
April	7	...	...	...
May	5	...	...	...
June	5	1	...	...
July	3	2	...	...
August	8	...	...	...
September	6	...	...	...
October	3	...	...	...
November	6	...	...	...
December	4	...	...	...
Total—70	...	65	5	...	...

274. Passengers placed under surveillance by the Port Health Officer as follows :—

For Small-pox	...	...	9
For Cholera	...	...	Nil.
For Plague	...	...	1
For Yellow Fever	...	...	Nil.

275. Vessels consigned to the Demerara Bauxite Company, Mackenzie, Demerara River, with crews placed under surveillance by the Port Health Officer were allowed to proceed to their destination. In each case the Medical Officer of the Bauxite Company was instructed to keep all members of the Crew of each vessel under surveillance until the Quarantine period had expired and to report at the expiration of the period.

276. During the year five (5) passengers arriving in the Colony from Quarantinable Ports were vaccinated.

VESSELS VISITED BY THE PORT SANITARY INSPECTOR.

277. The total number of vessels visited was as under :—

<i>Steamers.</i>		<i>Sailing Vessels.</i>	
Ocean Steamers ...	152	Schooners ...	79
Coasting Steamers ...	52	Other Craft ...	29
	204		108

278. The total number of visits paid to vessels was as follows :—

<i>Steamers.</i>		<i>Sailing Vessels.</i>	
Ocean Steamers ...	412	Schooners ...	477
Coasting Steamers ...	715	Other Craft ...	56
	1,127		533

279. The above visits include routine inspection of Government Steamers.

NOTICES SERVED ON MASTERS OF VESSELS LYING IN PORT.

280. During the year no written notices were served on Masters of vessels by the Port Sanitary Inspector. Nuisances occurring on board vessels were abated according to verbal instructions issued.

VESSELS FUMIGATED AND DISINFECTED BY THE PORT HEALTH AUTHORITIES.

281. One vessel was fumigated with Sulphur Gas during the year and the cabin and baggage of one passenger, a Chicken-pox patient to this Colony, and the crews' quarters on another occasion were disinfected with formalin.

282. Plague precautions were enforced on sixty-seven (67) vessels whilst lying alongside the quay at Georgetown or at Mackenzie, Demerara River.

CARE OF MERCHANT SEAMEN.

283. Thirty-two (32) sick seamen were sent to the Public Hospital, Georgetown, for treatment during the year from ocean-going vessels.

DISINFECTION AND FUMIGATING MACHINES.

284. *Clayton Fumigator at the Public Hospital, Georgetown.*—This machine was never actively employed during the year but was subjected to a quarterly test and gave satisfaction on each occasion. New hose is required for the machine.

285. Trays for burning sulphur have been used in the fumigating of one vessel.

286. *Washington Lyon Steam Disinfector at the Quarantine Station, Best, West Coast, Demerara.*—This machine was subjected to a quarterly test during the year and worked satisfactorily on each occasion. Several charges of bedding were sterilized for the Tuberculosis Hospital.

287. *Clayton Rat Gassing Machine.*—This machine was not used during the year, but is in good condition.

QUARANTINE STATION, BEST, WEST COAST, DEMERARA.

288. Regular attention has been directed to the keeping of this station compound in a sanitary condition including the weeding of grass, bushing and the maintenance of proper drainage.

289. The condition of the water receptacles on the whole is satisfactory; there is, however, the need for an increase in the number of these receptacles to meet dry weather conditions. The necessity never arose during the year to utilize the Quarantine Station for the accommodation of persons arriving in the Colony under surveillance from infected ports, nor was there any case of a dangerous infectious disease in the Port of Georgetown and its vicinity during 1931.

REMARKS.

290. Cablegrams were interchanged as heretofore between the Health Officer of this and other Convention Ports giving notice of passengers under surveillance on board vessels about to sail.

291. The total revenue accruing to Government from sanitary services in the Port of Georgetown in 1931 amounted to \$297.50; this amount included \$5 for hire of apparatus for fumigating one ship.

XIV.—METEOROLOGICAL.

292. The rainfall during the year, as registered at the Botanic Gardens, (Georgetown), was 69.26 inches as against 84.87 inches in 1930, and the mean degree of humidity was 80.2 as compared with 80.9 in the previous year.

293. The mean of the four recording stations in Georgetown was 70.40 inches as against 80.80 inches in 1930.

294. The following is the meteorological return for the year :—

Month.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maxi- mum.	Mini- mum on Grass.	Shade Maxi- mum.	Shade Mini- mum.	Range.	Mean.	Amount in Inches.	Degree of Humi- dity.	General Direc- tion.	Average Force. Velocity	
January ...	159.1	72.5	84.9	75.6	14.0	80.2	1.72	79.3	N.E.	6.67	
February ...	152.3	73.2	85.7	76.7	17.9	81.2	3.09	77.7	N.E.	7.69	
March ...	151.4	73.1	86.5	76.9	16.0	81.7	1.49	74.9	S.E.	3.37	
April ...	150.7	73.9	87.9	77.6	15.0	82.7	1.27	74.3	S.E.	7.99	
May ...	145.4	74.3	85.7	76.9	16.0	81.3	11.49	82.8	S.E.	6.07	
June ...	145.8	73.8	85.6	76.2	14.0	80.9	11.47	84.8	S.E.	4.35	
July ...	146.3	73.3	85.5	75.1	18.0	80.3	12.42	82.9	S.E.	4.21	
August ...	148.3	73.5	86.7	75.8	16.5	81.2	6.44	81.3	N.E.	4.86	
September ...	152.6	74.3	87.6	76.7	15.0	82.1	4.43	80.5	N.E.	5.56	
October ...	151.9	73.6	87.9	76.6	16.0	82.2	5.62	78.5	N.E.	6.26	
November ...	150.6	73.9	86.6	76.9	17.0	81.7	2.05	81.4	N.E.	5.73	
December ...	148.9	72.4	84.3	75.8	12.0	80.0	7.77	84.3	N.E.	5.69	
Mean ...	149.5	73.5	86.2	76.4	...	81.3	69.26 Total	80.2	...	6.18	

Georgetown—Registered Rainfall for the year 1931 ... Mean 70.40 inches.

XV.—RECOMMENDATIONS.

295. As previously mentioned (paragraphs 99 and 100) the new Out-patient Admitting and Casualty Departments at the Public Hospital, Georgetown, were completed during the year.

296. The following are the recommendations which are deserving of serious and urgent consideration :—

Public Hospital, Georgetown.—The provision of better and more suitable accommodation for the treatment of Tuberculosis; the present Tuberculosis ward is far from satisfactory.

Mental Hospital, Berbice.—The erection of further blocks for the better segregation of mental patients and for the treatment of paying and voluntary patients. The accommodation at this institution has been inadequate for some years past and this feature was commented on by Sir Wilfred Beveridge on his recent visit to the Colony.

APPENDIX I.

ANNUAL REPORT OF THE GOVERNMENT BACTERIOLOGICAL DEPARTMENT FOR THE YEAR 1931.

1.—STAFF.

Bacteriologist and Pathologist	...	Geo. H. Steven, M.B., Ch.B. (Edin).
Laboratory Assistants	...	Messrs. I. and E. A. Singh.
Volunteer Assistant	...	R. L. Morgan.
Clerical Assistant	...	W. O. Haynes.
Laboratory Attendant	...	Miss V. Shipley.

Mr. Haynes resigned in February and Mr. Morgan was appointed Clerical Assistant.

2.—LEAVE.

The following Officers were on leave of absence during the year :—

Dr. G. H. Steven from 9th December to 14th December.

I. Singh from 23rd July to 2nd August.

E. A. Singh from 11th May to 24th May.

W. O. Haynes from 16th February to 27th March.

During the absence of Dr. G. H. Steven, his duties were performed by Dr. S. Bettencourt-Gomes, Government Medical Officer, attached to the Public Hospital, Georgetown.

3.—BACTERIOLOGICAL AND SEROLOGICAL WORK.

The specimens examined during the year numbered 12,264, an increase of 3,117 (35%) over the figures of 1930.

Of these 5,707 were Wasserman Examinations of Blood and Cerebro-Spinal Fluids, showing an increase over previous year of 1,780 (45%).

4.—LIST OF DETAILED EXAMINATION.

1. *Microscopic and Chemical.*—

Throat Swabs for Klebs-Loeffler Bacilli	...	...	95
Sputum for Tuberculosis	...	...	976
Nasal Smears for Lepræ Bacilli	...	...	89
Fæces for Helminths and Dysentery	...	...	980
Blood for Malaria Parasites	...	...	554
Blood for Micro-filaria	...	...	41
Blood Counts	...	...	496
Smears for Gonococci and Spirochætes	...	...	1,241
Pus for Organisms	...	...	70
Urine (microscopic and chemical)	...	...	579
Tissues for Section	...	...	23
Cerebro-Spinal Fluids (Cell Count, etc., etc.)...	...	...	43
Varia	..	...	45
			5,232

2. *Cultural.*—

Urine Cultures	...	...	29
Blood Cultures	...	...	208
Cultures for K. L. B.	...	...	95
Pus Cultures	...	...	83
Water Examinations	...	...	7
Fæces Cultures	..	...	210
Autogenous Vaccines	...	...	36
			668

Carried forward 5,900

Brought forward	...	...	5,900
3. Pathological and Biochemical.—			
Widals	...	...	255
Blood Urea Estimations	...	...	236
Blood Sugar Estimations	...	...	120
Urea Concentration Tests	...	...	46
Wasserman Reactions	...	...	5,707
			<hr/> 6,364
Total	...	...	<hr/>12,264

5.—SOURCE OF SPECIMENS EXAMINED.

Most of the specimens were received from the Public Hospital, Georgetown, and the various Clinics and Out-patient Departments attached.

The source of specimens examined is shown below :—

Public Hospital, Georgetown	...	...	10,223
Other Government Institutions	...	...	621
Districts run by Government Medical Officers	...	...	178
Private Practitioners	...	...	1,242
			<hr/> 12,264
Total	...	...	<hr/>12,264

REMARKS OF VARIOUS DISEASES, ETC., INVESTIGATED.

6. *Helminths*—

980 specimens of fæces were examined and of these 323 contained ova.

Anchylostomum Duodenalis was found in 245 cases = (34 per cent.)

Ascaris Lumbricoides 55 cases = (5.5 per cent.)

Trichuris Trichiura 23 cases = (2.3 per cent.)

The percentages in 1930 were 21 per cent., 5.5 per cent. and 2 per cent. respectively.

7. *Dysentery*—

167 of above fæces were examined specially for presence of Amœbæ; and *Entamoeba Histolytica* or Cysts were found in 11 cases (6 per cent.).

These fæces were also cultured for Bacillary Dysentery.

A *Bacillus* of the Flexner Group was isolated on two occasions and *Bacillus Shigha* once.

The number of cases of Clinical Dysentery confirmed in the Laboratory was 14—(8 per cent.)—11 Amœbic and 3 Bacillary.

In 1930 the figures were 6 Amœbic and 3 Bacillary from 104 suspected cases.

8. *Enteric Group of Diseases*—

255 Widal examinations were made of which 72 were positive (28 per cent.) as against 88 (37 per cent.) positive out of 237 tests in 1930.

62 (86 per cent.) agglutinated with *B. Typhosus*; 4 each (5.5 per cent.) with Paratyphoid "A" and "B" and 2 (2.5 per cent.) with Paratyphoid "C."

The percentages in 1930 were 84 per cent. *B. Typhosus*, 7 per cent. Para "A," 8 per cent. Para "B" and 1 per cent. Para "C."

9. From 196 Blood Cultures made *Bacillus Typhosus* was isolated on 7 occasions (3.7 per cent.).

In 1930 the figures were 187 Blood Cultures with *Bacillus Typhosus* isolated 15 times (8 per cent.).

10. Forty-three fæces only were sent for examination. No organism of this Group (Enteric) was isolated.

In 1930 *Bacillus Typhosus* was isolated on 6 occasions from 47 fæces.

11. Examination of fæces in Enteric cases is rather disappointing. Only 43 specimens were submitted and all for the purpose of diagnosis. As I mentioned in the 1930 Report fæces are not examined before patients leave hospital, which is a pity as the spread of disease is chiefly by excrement and the duration of Carriers in convalescent cases is very variable.

12. Nephritis—

Routine estimation of Albumen in Urine and Urea in Blood was made during the year.

About 400 specimens of Urine were fully examined and of these 130 contained more than 0.05% of Albumen.—(32%).

236 Blood Ureas were estimated and of these 110 contained more than 50 milligrams per 100 c.c. (45%), and 46 over 100 milligrams per 100 c.c. (20%).

These examinations show that the existence of or tendency to Renal Disease is by no means negligible.

13. Tuberculosis—

976 Sputa were examined during the year, practically the same as in 1930.

137 were found to contain Tubercle Bacillus (16%) as against 21% in 1930.

The drop in percentage is not a real one as no sputa were received from the Clinics of the Tuberculosis Society after April. Thirty-eight specimens with nine positives (25%) were examined during the first three months. It is possible if these Clinics had continued to send specimens the percentage of 1931 would have equalled 1930.

In addition 129 sputa were examined from patients in the Best Hospital Eighty-six contained Tubercle Bacillus (66%) as against 60 positive out of 80 sputa (73%) in 1930.

14. Venereal Disease—

5,687 Wasserman reactions on Blood Sera were done during the year and 20 on Cerebro-Spinal Fluids.

This is an increase of 1,795 over the 1930 figure and 2,011 over 1929.

The results for the last two years are tabulated below :—

	1931.	Percentage.	1930.	Percentage.
Positive ...	1,973	35	1,378	35
Weak Positive...	806	14	753	20
Negative ...	2,928	51	1,781	45
Total ...	5,707		3,912	

15. The decrease in the Weak Positives is noteworthy. These are all treated cases from the Clinic and it points to the fact that improved methods are leading to a more speedy sterilisation.

The Positive Rate however still continues high.

16. 532 adult patients from the Infant Welfare and Antenatal Clinic were examined during the year.

125 of these were positive (23%).

17. Examination of smears for Gonococci and Spirochaetes increased from 436 in 1930 to 1,241 in 1931.

No accurate deductions can be made from the results as patients under treatment are examined very frequently and most of the specimens came from the V.D. Clinic.

18. *Diphtheria*—

95 Pharyngeal Swabs were examined for Klebs-Loeffler Bacillus.

In 16 the presence of the Bacillus was proved (17%).

19. *Leprosy*—

80 Nasal Swabs were examined for Bacillus Lepra and it was found in 9 cases, all of which were Nodular in type.

Most of the other cases were typical cases of Nerve Leprosy.

20. *Malaria*—

Following a request for Malarial Films from a London source in May, 554 specimens were examined, only 49 of which were received prior to June.

Plasmodia were found in 131 films (24%).

Plasmodium Vivax was found in 121 of the positives (93%).

Plasmodium Falciparum was found in 9 of the positives.

Plasmodium Malariae was found once only.

21. *Vaccines*—

Antityphoid Vaccine for B. Typhosus, B. Paratyphosus A. and B. was made and 3,000 c.c. issued to various districts.

Over 3,000 c.c. Haemolytic Streptococcal Vaccine, mixed strains, for Filarial prophylaxis was made. This was injected chiefly in the Laboratory and the average weekly attendance was over 20 patients.

36 Autogenous Vaccines were made and distributed during the year.

22. *Post Mortem Examinations*—

One hundred and twenty-six were done as against 117 in 1930.

The following Table shows the "Causes of Death":—

GENERAL DISEASES—

1. Anchylostomiasis	...	...	...	1	
2. Dysentery	...	...	...	1	
3. Diabetes Coma	...	...	...	1	
4. Enteric Fever	...	...	...	2	
5. Chronic Malaria	...	...	...	7	
6. Maldevelopment	...	...	...	3	
7. General Peritonitis	...	...	...	6	
8. Septicæmia	...	...	...	5	
9. Tertiary Syphilis	...	...	...	1	
10. Miliary Tuberculosis	...	...	...	1	28

INJURIES—

1. Burns	...	..	..	1	
2. Cerebral Hæmorrhage (Traumatic)	...	..	..	1	
3. Fracture of Skull	...	..	..	1	
4. Rupture of Liver	...	..	..	3	
5. Cutlass wound of Skull and Brain	...	..	..	1	
6. Punctured Kidney	...	..	..	1	8

Carried forward 36

Brought forward ...	...	...	36
MALIGNANT TUMOURS—			
1. Cancer of Liver	...	...	2
2. Sarcoma of Melanotic Mesentery...	...	...	1
3. Sarcoma of Hip and Lung	...	...	1
			<hr/> 4
DISEASES OF BRAIN AND MEMBRANES—			
1. Cerebral Abscess	...	...	1
2. Cerebral Hæmorrhage	...	...	5
3. Mastoid Abscess	...	...	1
4. Meningitis	...	...	5
			<hr/> 12
DISEASES OF THE CIRCULATORY SYSTEM—			
1. Aneurysm Innominate Artery	...	...	1
2. Cardiac Failure and Myocarditis	...	...	8
3. Cardiac Failure with Bronchitis & Emphysema	...	...	2
4. Cardiac Failure with Valve Stenosis	...	...	3
5. Rupture of Iliac Artery (Traumatic)	...	...	1
			<hr/> 15
DISEASES OF THE RESPIRATORY SYSTEM—			
1. Empyema	...	...	4
2. Phthisis Pulmonalis	...	...	7
3. Oedema Glottidis	...	...	1
4. Pleurisy (Acute)	...	...	1
5. Lobar Pneumonia	...	...	9
6. Broncho-pneumonia	...	...	1
			<hr/> 23
DISEASES OF THE DIGESTIVE SYSTEM—			
1. Appendix (Gangrenous)	...	...	1
2. Duodenal Ulcer	...	...	2
3. Acute Gastro-Enteritis	...	...	3
4. Gastric Ulcer (Perforated)	...	...	2
5. Intussusception	...	...	1
6. Intestinal Obstruction (Acute)	...	...	2
7. Jaundice	...	...	1
8. Tuberculosis of Bowel	...	...	1
			<hr/> 13
EXCRETORY SYSTEM—			
1. Cysts of Ureter and Uræmia	...	...	1
2. Nephritis (Acute)	...	...	4
3. Nephritis (Chronic Parenchymatous)	...	...	5
4. Nephritis (Chronic Interstitial)	...	...	4
			<hr/> 14
GENERATIVE SYSTEM—			
1. Abortion	...	...	2
2. Concealed Hæmorrhage	...	...	1
3. Salpingitis and Peritonitis	...	...	6
			<hr/> 9
		Total	<hr/> 126 <hr/>

GEO. H. STEVEN,
Government Bacteriologist.

27th January, 1932.

APPENDIX II.

STUDIES ON THE EPIDEMIOLOGY AND ETIOLOGY OF BLACKWATER FEVER
ON THE DEMERARA RIVER, 1923-1932,

BY

GEORGE GIGLIOLI, M.D. (ITALY), D.T.M. & H. (LONDON),
C.M.O., DEMERARA BAUXITE CO., LTD., B.G.

Blackwater fever is a disease on which we know very little, in spite of the remarkable number of hypotheses and theories which have been expounded to explain its etiology and pathogenesis. Also on the general epidemiology of the disease our knowledge is poor and fragmentary, mainly in consequence of the very difficult conditions under which the disease has been studied in most instances.

Immunity, or conversely susceptibility, plays a great part in the epidemiology of Blackwater. We find in fact that the native population of the endemic areas usually presents a remarkable and often quasi-absolute immunity to hæmoglobinuria, while the condition is common in recent immigrants, particularly of European race.

In the tropical countries where blackwater is most frequent, the European element represents a small minority characterized by a remarkable heterogeneity as to origin, length of residence, degree of acclimatization, exposure to malaria infection, habits, etc., etc. Adult males prevail; children are scarce, the majority live in towns where blackwater is exceptional and usually imported; the rest are sparsely distributed over enormous tracts of country. Under such conditions the task of the epidemiologist is a hard one. Every case has to be investigated and interpreted separately. The risks of error are multiple and all generalization is hazardous.

Most of the work done in Africa has been carried out under such conditions. The 110 cases studied by Thomson in Southern Rhodesia in 1922-23 originated from an area approximately equal to that of Great Britain. Deeks and James in Panama, from 1905 to 1910, studied 232 cases of hæmoglobinuria; but here again conditions were extremely abnormal for epidemiological work. The native Panamanians were found to be immune, and the cases studied were collected from a mass of over 43,000 adult male contract labourers of Negro, White, and mixed race, originating from malarial and malaria-free countries, from North, South and Central America, from the West Indian Islands, and from five European countries.

Blackwater is not a common disease, and it is rarely given to a single observer to study many cases in any one locality, unless special conditions occur. If these conditions are the result of an unusual prevalence of the disease, endemic or epidemic, in the native or acclimatized, settled population of the region, then optimum conditions are realized for epidemiological work. If, on the other hand, the prevalence of the disease is produced by a change in the population, typically by immigration from other countries of a large but heterogeneous mass of men, then conditions become extremely difficult, as the factor immunity (or conversely, susceptibility) has to be separately investigated for every single case and individual on data, the reliability of which is always doubtful. The clinician simply deals with cases of the disease; the epidemiologist must study such cases in relation to the mass of the population and to the environment in which they occur; data obtained at the bedside are far from sufficient. To record that a hæmoglobinuria patient has suffered from repeated subtertian attacks, and to establish the fact by clinical and laboratory investigation, represents only a unilateral view of the problem. It remains to be determined why the hundreds of thousands who have equally and in the same region suffered from repeated subtertian attacks under identical conditions have not and do not develop Blackwater.

The view at present held by many, mainly following Thomson's work in Rhodesia (1923), that Blackwater is a reaction to chronic infection and re-infection with *P. falciparum*, and that its epidemiology is governed by the distribution and endemic index of this parasite and the degree of susceptibility of the population, is very difficult to defend. In many regions where subtertian malaria is endemic and severe Blackwater is practically unknown. (Roman Campagna, according to Marchiafava and Bignami, 1931; Funjab, according to Sinton, 1929). It was on the base of such distributional characteristics that Manson and Sambon regarded Blackwater as a disease "a se."

Nocht has suggested that malarial hæmoglobinuria may be the outcome of infection with special hæmolytic strains of the Plasmodia. These would be morphologically identical to the ordinary forms, but would be characterized by the biological property of causing hæmolysis. Low blood cholesterol and quinine, according to Nocht, would both be favouring factors for the production of hæmolysis and hæmoglobinuria. Hæmolysins have been found in the blood of hæmoglobinuric patients by Ghiron and again by Gosio. Nocht has not been able to confirm such findings; he doubts that hæmolysins should be demonstrable, as the amount sufficient to produce hæmolysis is so small as to escape detection by laboratory methods. Hæmolysins cannot be detected, for instance, in the blood of animals suffering from experimental hæmoglobinaemia and hæmoglobinuria, consequent to injection of heterologous hæmolytic amoceptor.

According to Nocht's suggestion, Blackwater would be due to a direct action of the infecting parasite, and not, as Thomson would have it, to a reaction of more or less obscure nature and pathogenesis, secondary to ordinary chronic subtertian malaria.

It is evident that a great deal can be learnt concerning the relative value of these etiological theories by a careful study of the epidemiology of the disease, but special precautions are essential in order to reduce this difficult problem to its simplest expression, so as to eliminate as far as possible the risks of error. The following conditions should be fulfilled:—

- (1) Investigation should be restricted to a limited area, so that a careful study of the field in which the disease occurs may be possible.
- (2) The native or the settled acclimatized population of the region should be susceptible to blackwater. The disease must be studied in this section of the population, not in the casual, recent or unacclimatized immigrants.
- (3) The investigation of the epidemiology of malaria, in all its details, in the same district is essential.
- (4) Observation should extend over a prolonged period of years to determine the epidemiological fluctuations of the disease and their relation to those of malaria.

In 1927 Whitmore, during a short visit to Cuba, "studied malarial hæmoglobinuria in a white race, living their lives for generations in the region." Unfortunately, the material available was scarce. But this author's observations on the recurrence of blackwater in certain Cuban families are of very great interest.

The present report deals with observations carried out between October, 1932, and March, 1932, on the Mid and Upper Demerara, in a District extending some 45 miles along the River, from Christianburg to Malalli.

The Demerara River District offers a very good field of work; all the settlements are situated on the river banks, and are easily accessible. The total popula-

tion of the mid and upper river, excluding the Camoonie Creek, according to the 1931 census amounts to 7,550 and is made up as follows:—

Race.	Males.	Females.	Persons.
Europeans other than Portuguese	41	24	65
Europeans—Portuguese ...	62	33	95
East Indian ...	795	526	1,321
Negroes ...	2,209	1,543	3,752
Chinese ...	63	35	98
Aborigines ...	270	239	509
Mixed Races ...	902	793	1,695
Races not stated ...	11	4	15
Total ...	4,353	3,197	7,550

The population of the villages of Christianburg, Relief and Support amounts to 1,764 persons, of which 830 are males and 934 females. Negroes account for two-thirds of the village population (1,155). The rest of the population is distributed in small settlements, farms and mining camps.

These figures do not exactly correspond to the area in which my investigation has been carried out, as they include the lower reaches of the river, where the East Indian race prevails. On the mid and upper river, the number of East Indians could scarcely exceed 250. As regards the other races, the census figures should correspond closely to those of the area covered by my work.

The mixed races, with White, Aboriginal, and Negro blood, constitute the typical settled population of the District. The proportion of the sexes and of adults to children are therefore within the normal average.

Only a small part of the Negro population really belongs to the district; the majority are temporary immigrants from the Coast and from the West Indian Islands, (mainly Grenada, St. Lucia, St. Vincent). The male sex prevails and children are relatively scarce.

The standard of living, general habits, degree of education, degree of exposure, malarial infection, facilities of treatment, general sanitary conditions, etc. are remarkably uniform throughout the district and for the various races.

Mackenzie Hospital is the only medical institution in the district, so that most of the cases of serious disease occurring in the surrounding area are seen as In- or Out-patients. Of these card index records are kept, so that in the course of years a large amount of material has accumulated; from these records the more important data in the medical history of a considerable proportion of the population of the district for the past six years can be obtained. It is also possible to trace the chronological and place relations of the various diseases. Outside the Hospital, a thorough knowledge of localities and of the people, gradually built up by long observation, has been of the greatest assistance.

Malaria is by far the most important disease in the region. It is not possible in this report to deal with the epidemiology of this disease on the Demerara River; on this I have reported already, and reference to my former publications is essential. Malaria is hyperendemic in the district; *A. argyritarsis* is the vector; there is a marked malarial season following the May to July rains, with the maximum number of cases in September and October. Subtertian malaria prevails; new *P. falciparum* and *P. malariae* infections are frequent during the autumn and winter months.

(1)—INCIDENCE OF BLACKWATER, AND ITS RELATION TO MALARIA.

From January, 1923, to December, 1931, inclusive, 12,502 cases of malaria and 63 cases of blackwater have passed through my hands, many of the latter were treated repeatedly for relapses.

In Table 1 a complete record of all the cases of Blackwater observed is given, with annotations on the age, race, sex, locality, date of occurrence and termination for each patient. Cases are grouped in chronological order according to locality and to family connection.

TABLE No. 1.

CASES OF BLACKWATER OBSERVED FROM THE MID AND UPPER DEMERARA 1923-1932 (MARCH).

Case No.	Locality.	Name.	Date.	Age.	Race.	Sex.	Relapses.	Termination.	Remarks.
1	Retrieve land	Cor. F.	26. 2.27	13	Mixed	M.	None	Recovery	
2	Do.	Cor. J.	25. 4.27	19	"	M.	2	Recovery	
3	Do.	Cor. L.	30. 6.27	20	"	F.	1	Recovery	
4	Do.	Allie. A.	8. 9.27	46	"	M.	None	Recovery	
5	Do.	Allie. An.	14. 7.27	15	"	F.	None	Recovered	
6	Do.	Allie. H.	25.10.28	79	"	F.	None	Recovered	
7	Do.	Luther	21. 7.27	4	"	F.	None	Recovered	
8	Do.	Duggin	19. 8.27	6/12	"	M.	?	Recovery	
9	Do.	Stellinb.	19. 8.27	58	Abor. I.	M.	1	Recovery	Reported to have died from a relapse.
10	Do.	Simmons	22. 8.27	6	Abor. I.	M.	?	Recovery	
11	Do.	Sookool	7. 9.28	4	East I.	F.	1	Recovery	
12	Do.	Allie. E.	5. 8.31	36	Mixed	M.	None	Recovery	
13	Mackenzie	Per. O.	20. 3.27	5	"	F.	4	Recovery	
14	Do.	Per. F.	10. 5.27	36	"	M.	1	Death in 2nd attack	
15	Do.	Per. N.	29. 9.28	14	"	M.	None	Recovery	
16	Do.	Blane. S.	11. 3.27	7	"	M.	None	Recovery	
17	Do.	Lamb. O.	15. 3.27	24	Abor. I.	F.	None	Recovery	
18	Do.	Long. M.	29.11.26	44	Eur.	M.	None	Death	
19	Do.	Carr. D.	24.12.26	6	Mixed	F.	None	Recovery	
20	Do.	McPhears.	1. 5.27	12	"	F.	None	Died	
21	Do.	Manson-H.	10. 8.27	29	Chin.	M.	None	Died	
22	Do.	Bess	18. 8.27	13	Mixed	F.	None	Recovery	
23	Do.	Brumell	17. 4.31	39	Negro	F.	...	Death	
24	Carla	Gid. A.	2. 6.27	14	East I.	F.	None	Recovery	
25	Do.	Gid. N.	7. 5.28	8	"	F.	None	Recovery	
26	Do.	Gid. E.	12. 9.27	8	"	M.	1	Recovery	
27	Lucky Spot	Edm. C.	27. 5.27	10	Mixed	M.	...	Death	
28	Do.	Köm. V.	30. 5.27	7	"	M.	1	Death in 2nd attack	
29	Do.	Edm. J.	Feb. 28	6	"	M.	None	Recovered	
30	Coomacka	DeClou, E.	Dec. 26	9	"	F.	3	Recovered	
31	Do.	DeClou, D.	Dec. 26	6	"	F.	6	Recovered	
32	Do.	DeClou, V.	15. 2.27	10	"	M.	...	Death	
33	Akyra	Serr. O.	24.10.26	10	"	M.	1	Recovered	
34	Do.	Serr. A.	9.12.27	38	"	M.	None	Recovered	
35	Do.	Matthew	9.10.24	10	Negro B.G.	M.	...	Death	
36	Do.	Knights	1.11.24	19	Negro B'doa	M.	...	Death	
37	Do.	Robnson	12.11.24	8	Abor. I.	M.	?	Recovery	
38	Do.	Jules	13. 1.25	25	Negro G'da.	M.	None	Recovery	
39	Do.	Fox	11.10.26	13	Abor.	F.	...	Death	
40	Do.	Granger	23. 4.27	21	Negro B.G.	M.	None	Recovery	
41	Do.	Asson	18.12.28	23	Negro D'ca.	M.	None	Recovery	
42	Christianburg	Playtner	1. 1. 27	26	Negro B.G.	F.	?	Recovery	
43	Do.	Dean	18. 7.27	4	East I.	M.	1	Recovered	
44	Do.	Spence	27. 7.27	71	White	M.	...	Death	
45	Do.	Lewis	10. 8.27	8	Negro B.G.	M.	...	Death	
46	Do.	Rot.	18. 8.27	66	White	M.	None	Recovery	
47	Do.	Allie. M.	24. 8.27	8	Mixed	F.	?	Recovery	
48	Do.	East	15. 5.31	29	"	M.	...	Death	Reported in second attack.
49	Wismar	Edwards	13.12.27	14	Negro B.G.	M.	None	Recovery	
50	Do.	Stewart	27. 3.31	6	"	F.	None	Recovery	
51	Lucky Spot	Reece	7. 1.30	54	Mixed	M.	...	Death	
52	Richmond Hill	Henry	9. 7.30	40	Abor. I.	F.	None	Recovery	
53	Cape Star	Russell	39. 9.27	46	Mixed	M.	None	Recovery	
54	Trewern	Callender	7. 8.28	24	"	F.	?	Recovery	
55	Arcadia	Feidtkou	28. 2.27	13	"	F.	?	Recovery	
56	Bootooba	Lorrimer	18. 3.27	12	"	F.	2	Recovery	
57	Do.	Fleming	18. 3.28	12	"	F.	1	Recovery	
58	Do.	Fleming	15. 1.29	5	"	M.	7	Recovery	
59	Malalli	Feidtkou	2. 9.27	3	"	M.	?	Recovery	
60	Do.	Feidtkou	5.10.27	4	"	M.	None	Recovery	
61	Do.	Jacobs	1. 1.30	32	"	F.	?	Recovery	
62	Wismar	White	12.12.31	52	East I.	M.	...	Death	
63	Geed Hope	Spencer	21. 1.32	65	Mixed	F.	1	Death in 2nd attack	

Table 2 gives the number of cases of Malaria and Blackwater treated at our Hospital, month by month, from 1923 to 1931.

TABLE No. 2.
MONTHLY NUMBER OF CASES OF MALARIA AND OF BLACKWATER TREATED AT MACKENZIE HOSPITAL, 1923-1931.

Year.	Diseases.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Totals.
1923...	Malaria	125	73	70	52	48	30	35	65	53	25	29	31	628
	Blackwater	...	...	...	...	...	...	...	...	...	...	...	...	Nil
1924...	Malaria	40	31	35	27	40	25	78	130	120	120	90	75	811
	Blackwater	...	...	...	...	...	...	...	...	1	2	...	...	3
1925...	Malaria	105	85	130	78	85	126	127	99	116	140	80	46	1,217
	Blackwater	1	...	...	...	...	...	...	...	...	...	...	...	1
1926...	Malaria	85	62	55	48	26	69	110	169	140	380	405	380	1,911
	Blackwater	...	...	...	...	...	...	...	...	2	1	1	1	4
1927...	Malaria	290	230	180	144	190	152	165	128	118	110	150	100	1,957
	Blackwater	2	3	4	3	4	2	3	8	5	...	1	2	37
1928...	Malaria	145	102	88	52	102	126	151	170	130	175	164	137	1,542
	Blackwater	...	...	1	...	1	...	...	2	2	1	...	1	8
1929...	Malaria	181	145	124	136	157	143	128	169	180	95	65	85	1,608
	Blackwater	1	...	...	...	...	...	...	...	...	...	...	...	1
1930...	Malaria	196	177	176	132	105	116	95	101	119	115	92	70	1,494
	Blackwater	2	...	...	...	...	...	1	...	...	...	...	...	3
1931...	Malaria	77	88	157	136	101	118	130	156	147	96	59	89	1,334
	Blackwater	...	...	1	1	1	...	...	1	...	...	...	...	4
Totals	{ Malaria	1,244	993	995	805	854	896	1,019	1,179	1,123	1,256	1,125	1,013	12,502
	{ Blackwater	6	3	6	4	6	2	4	11	7	4	4	4	61

From these figures one sees that, in spite of a very high incidence of Malaria, Blackwater is not a common condition on the Demerara. In fact, if it were not for the little outbreak of 1926-27, which accompanied the important malarial epidemic, the disease could be regarded as definitely rare. We find that from January, 1923, to September, 1924, with mild Malaria, no cases of hæmoglobinuria were recorded. In the latter months of 1924, Malaria showed a very definite exacerbation, with numerous new infections, and at the same time four cases of Blackwater were seen (October-November, 1924, January, 1925). In 1925 Malaria was very prevalent, and 1,217 cases were treated, *i.e.*, practically 100% more than in 1923, and 50% more than in 1924. The majority of these cases were relapses from chronic infections, dating back to the summer and autumn of 1924. In spite of this prevalence of chronic infections, only one case of Blackwater was recorded for the year; this case occurred early in January as the result of a recent malarial infection, and as such must naturally be grouped with the other three cases occurring at the end of 1924.

For the first 9 months of 1926 no cases of hæmoglobinuria were recorded. With the onset of the malaria epidemic, which became definite in October, Blackwater *immediately* appeared. During the last three months of the year 1,165 cases of Malaria (nearly exclusively new and recent infections) and four cases of Blackwater were recorded.

In 1927 the epidemic continued during the early months; relapses were also very prevalent; 1,957 cases of Malaria were treated. Blackwater patients were practically always present in our wards, 37 cases being recorded. The maximum incidence occurred in August and September with 13 cases; this is the season when new infections are most easily contracted owing to the prevalence of anopheles following the May to July rains.

In 1928 with a distressingly high incidence of Malaria (1,542 cases) mainly due to insistent, constantly relapsing chronic infections, dating back to 1926 and 1927, but with relatively few new infections due to a marked fall in the number of anopheles only eight cases of Blackwater were observed. Of these, five occurred

during the August-October period, *i.e.*, at the season when new infection is most easily contracted. In 1928 various conditions, consequent to chronic Malaria, notably nephritis, were very frequent.

In 1929 with 1,608 cases of malaria, and still a very high proportion of chronic infections and varied complications due to chronic Malaria, blackwater was practically absent, only one case being observed in January.

In 1930 and 1931 with a very definite fall in the number of Malaria cases, owing to recovery of many of the old infections and scarcity of anopheles and new infections, only three and four cases of blackwater respectively were observed.

In conclusion, the evidence collected during the past nine years on the Demerara River tends to prove that the incidence of blackwater is related not to that of chronic malarial infection but on the contrary to recent malaria. Blackwater appears to occur at the same time and under the same conditions which favour the spread of new malarial infection, that is, when anopheles become unduly abundant.

Re-infection with *P. falciparum* has been regarded as a factor in the etiology of hæmoglobinuria. Re-infection in malaria, particularly in an untreated native population, is a matter on which we know extremely little. According to James, an untreated infection with a given strain of *P. vivax* tends to produce a definite immunity against that strain, but re-infection with other strains is possible. (The term *strain* is used in relation to the country of origin; Madagascar strain, British Guiana strain, etc.). Immunity to a *P. vivax* strain does not involve immunity to *P. falciparum* or *P. malariae*. One may therefore conclude that re-infection is more liable to occur either with a different species of parasite, or with a different strain or biological variety, from that which produced the primary infection.

If blackwater were caused by re-infection with the ordinary malaria parasites, the conditions of immunity and susceptibility of the local population remaining unaltered, we would expect to see blackwater cases more or less regularly during each malaria season. This is certainly not the case. Blackwater only appears when anopheles become exceptionally abundant, (1924-1926) *i.e.*, when conditions for the transmission of the malaria parasites become more than usually favourable. It is under similar circumstances that the rarer forms of malaria, as quartan for instance, become more frequent and with their typical complications stand out in evidence.

If we assume that blackwater is caused exclusively by particular strains or biological varieties of the malaria parasites, and that such strains are rare in the Demerara district, as the incidence of the disease indicates, we should then expect to find conditions similar to those I have described, unusual prevalence of anopheles, by multiplying the chances of transmission of these rare strains to non-immunes, would cause the appearance of the disease, the reservoir of infection would thus become larger, and the chances for the propagation of these strains would be further increased. If in the following malarial season conditions for transmission proved favourable, anopheles being abundant then a larger crop of blackwater cases could be expected. On the contrary, if such conditions fail, the reservoir of infection would gradually dwindle through the death or recovery of the human carriers, and the disease would again become rare or disappear.

(2)—RELATIVE INCIDENCE OF BLACKWATER IN THE VARIOUS RACES.

The varying degree of immunity presented by the different races towards Blackwater Fever is a question which has received considerable attention. It is a known fact that in Rhodesia and other African regions where the disease is common the native negroes are nearly absolutely immune. Sporadic cases occasionally occur, but are by no means common; Plehn on the Cameroon Coast observed outbreaks of hæmoglobinuria in gangs of native labourers who had recently arrived from the

healthy regions of the interior. He therefore regarded the immunity of the coast-land native as being acquired through residence in the endemic area. Manson Bahr states that "Negroes who live in places which are free from this disease develop Blackwater Fever as readily as Europeans, if they are exposed to the same conditions." This is not in accordance with the experience of Deeks and James in Panama; between 1905 and 1910, in the Canal Zone, the incidence of Blackwater per mille per annum was 0.29 for Negroes, and 5.79 for Europeans (including Cubans). Of the negroes who work in the Canal Zone during that period, 19,448 or two-thirds of the total were Barbadians. That is to say, they originated from an Island which is not only free from Blackwater, but at that time was also considered to be immune from Malaria. Whitmore points out that the Negroes in Panama were more exposed to contract Malaria than the other races, as, in spite of all efforts, their standard of living was extremely insanitary.

Such comparative studies of racial immunity present many difficulties, as, in most cases, while one race is native to the country, the others are represented by immigrants whose degree of acclimatization and past history may vary within wide limits both in the mass and in the individual. Under such conditions many other factors besides race may come into play.

British Guiana possesses a remarkable mixture of races; the Negroes may now be regarded as the natives of the country. Most of the East Indians, Portuguese, Chinese and individuals of mixed blood now found in the Colony are born from parents who also were raised in the country. The climate is a good one, and even Europeans thrive.

In the Demerara district all the races are represented and live side by side under more or less identical conditions. Tables 3 and 4 summarize my findings on the incidence of Blackwater in the two sexes and in different races. This has been studied both in relation to the recent census figures (1931) and to the number of patients for each race, treated at our hospital for medical diseases, during the same period in which the Blackwater cases were recorded.

TABLE No. 3.

SEX AND RACE DISTRIBUTION OF 63 CASES OF BLACKWATER FEVER FROM THE DEMERARA RIVER. RELATIVE INCIDENCE OF THE DISEASE PER 1,000 INHABITANTS OF THE VARIOUS RACES CALCULATED FOR THE PERIOD 1923-1931, ON THE BASE OF THE 1931 CENSUS RETURNS.

RACE.	Number of Blackwater Cases.			Population of the District.			Blackwater per 1,000 Inhabitants.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total Population.
Negroes	7	3	10	2,209	1,543	3,752	3.16	1.94	2.67
Mixed	20	17	37	902	793	1,695	22.17	21.44	21.83
*East Indians	3	3	6	150	100	250	20.00	30.00	24.00
Aborigines	3	3	6	270	239	509	11.11	12.55	11.79
Chinese	1	...	1	63	35	98	15.87	...	...
Europeans	3	...	3	41	24	65	73.17	...	...
Portuguese	...	...	...	62	33	95	...	...	...
Other Races	...	...	...	11	4	15	...	...	...
Total	57	26	63	3,708	2,771	6,479	9.97	9.35	9.72

*East Indians prevail on the lower reaches of the Demerara, and their number according to the 1931 Census is 1321. They are scarce on the Mid and Upper River, and in the above table, I have estimated their number to 250.

TABLE No. 4.

RACIAL DISTRIBUTION OF 59 CASES OF BLACKWATER RECORDED FROM SEPTEMBER, 1926, TO DECEMBER, 1931, AND RELATIVE INCIDENCE PER 1,000 MEDICAL CASES OF EACH RACE TREATED AT MACKENZIE HOSPITAL, DURING THE SAME PERIOD.

RACE.	No. treated.	No. of cases of Blackwater.	No. of cases of Blackwater per 1,000 treated.
Negroes	3,564	7	1.96
Mixed	1,934	37	18.93
East Indians	413	6	14.52
Aborigines	593	5	8.43
European	...	...	...
Portuguese	...	...	...
Chinese	...	...	...
	302	4	13.24

The figures given in both these tables tend to correspond, and therefore confirm each other.

The Negro evidently shows a remarkably immunity; the Negro on the Demerara prevails numerically and moreover is usually an "outsider" from the coast, or from the more mildly malarial West Indian Islands.

The mixed races show the least immunity. For the other races, both as regards the population and number of cases, the figures tend to be too small to be conclusive, but they tend to show values similar to those which obtain for the mixed races.

(3)—THE INCIDENCE OF BLACKWATER IN THE VARIOUS AGE GROUPS.

The relative incidence of Blackwater in adults and children has not received as much attention as it deserves. In the text-books one usually reads that all ages are attacked. Thus, in Manson's "Tropical Diseases" we find the following statement:—"Individuals of all ages and both sexes are liable, but from consideration of the fact already put forward, it is obvious that it occurs more frequently in European men of mature years, who live in the countries where the disease is endemic." In current tropical medical practice, particularly under African conditions, there is no doubt that the above statement holds good. In most African regions, where blackwater is endemic and frequent, the European population is prevalently formed of adult men; children are lacking or rare: this is a very good reason for which the disease should not commonly be seen in children. Much the same can be said concerning Deeks and James' studies in the Canal Zone, which were entirely carried out on adult male labourers.

When a non-immune population is settled in a region where blackwater is endemic, children are frequently attacked. (Deaderick in the U.S.A. in 1914, Thomson in Rhodesia in 1924). According to my findings on the Demerara, children are about three times as liable to the disease as adults. The morbidity to blackwater is highest in the first decade of life; it falls progressively during the second decade, and is low after the 20th year. This is clearly shown in Table 4.

TABLE No. 5.

AGE GROUP DISTRIBUTION OF 63 CASES OF BLACKWATER.

INCIDENCE PER 1,000 INHABITANTS FOR EACH AGE GROUP (1931 CENSUS) DURING THE 9 YEARS PERIOD 1923-1931.

Age Group.	Number of Blackwater cases.	Number of Inhabitants.	Incidence per 1,000 Inhabitants.
Below 10 years	24	1,592	15.07
11 to 20 years	14	1,384	10.11
Above 20 years	25	5,098	5.00

In this table, it has not been possible to give a further analysis of the age distribution and incidence of the disease in the different races, as the necessary data are not available from the census returns.

The Negro element prevails in the population of the Demerara district, with a strong percentage of adult temporary immigrants from the coast and islands. The Negroes moreover, as has been shown, have a remarkable degree of immunity to hæmoglobinuria. It is therefore possible that the relative rarity of the disease among adults should, in reality, be due not to the factor age but to the numerical prevalence of the racially immune Negroes in the adult section of the population.

To investigate such a possibility, in Table 6 I have correlated the number of cases of Blackwater seen in children and adults from September, 1926, to December,

1931, to the number of children and adults of each race treated at Mackenzie Hospital during the same period for medical diseases.

TABLE No. 6.

INCIDENCE OF BLACKWATER IN ADULTS AND CHILDREN IN THE DIFFERENT RACES.

INCIDENCE OF BLACKWATER IN ADULTS AND CHILDREN PER 1,000 PATIENTS OF THE CORRESPONDING AGE GROUPS OF EACH RACE, TREATED AT MACKENZIE HOSPITAL, FROM SEPTEMBER, 1926, TO DECEMBER 1931.

RACE.	No. of cases Blackwater in children below 16 years.	No. of Children treated for all diseases.	No. cases of Blackwater per 1,000 children treated below 16 years.	No. of cases Blackwater in Adults.	No. of Adults treated for all diseases.	No. of cases of Blackwater per 1,000 adults treated.
Negroes	3	607	4.94	4	2,967	1.35
Mixed	24	722	33.24	13	1,232	10.55
Aborigines	2	247	8.09	3	346	8.67
East Indians	5	87	57.47	1	226	4.42
Europeans	}	31	...	4	271	14.76
Portuguese						
Chinese						

The figures shown in this table tend to confirm those of Table No. 5. The incidence of the disease in children per mille patients, below 16 years of age in the two main racial sections of the population, is about three times as high as the corresponding value found for adults. In the East Indian race, the prevalence of child cases is even more striking, but numbers are small; the Aborigines show approximately the same incidence in adults as in children. For the other races children are very scarce in the district and only adult cases have been observed.

(4)—BLACKWATER FEVER AS A FAMILY AND HOUSE DISEASE.

The recurrence of blackwater in certain families and houses is a striking characteristic of the epidemiology of the disease on the Demerara river. In 63 cases, 22 or 35 per cent. originated from only nine families. This in a district where malaria is hyperendemic with a prevalence of *P. falciparum*, and on a population of close on 6,500.

Family No. 1.—Name: Corn.....Race, Mixed. Residence, Retrieve Land.

Composition of family: Parents and four children. Three of the children developed blackwater between February and June, 1927, with an aggregate of six attacks (Table I, Cases Nos. 1, 2, 3.)

Patient No. 3 during the summer of 1927 lived in the house of a married sister in the same locality. She suffered a blackwater relapse in this house in October, 1927 (Family No. 2). On the 8/9/27, the sister's husband developed blackwater (Table I, Case No. 4). In another house contiguous to the last, and inhabited by a closely related family (Family No. 3), two more cases of blackwater occurred in July, 1927, and October, 1928, respectively (Table I, Cases 5 and 6). At much the same time as the above cases, four others occurred in the same neighbourhood (Table I, Cases Nos. 7, 8, 9, and 10).

Retrieve land is a locality which extends for approximately one mile on the right bank of the river opposite the Village of Christianburg. Houses are fairly numerous and sparsely situated. The ground is very low; the houses are surrounded and often smothered by thick vegetation. These conditions are much the same, and no worse than those of any other locality along the river. No local conditions have been traced which might in any way render these blackwater fever houses, either for their situation and construction, or for the race and habits of their inmates, more unhealthy and more malarious than one hundred others, situated in the same neighbourhood and generally throughout the district. The families which were attacked by blackwater were not those who were more seriously harassed by chronic malaria.

Family No. 4.—Name: Per.....Race. Mixed. Residence, Mackenzie. Composition of family, Parents and eight children. The father and one of the children suffered from hæmoglobinuria between March and May, 1927. (Table 1, n.o. 13 and 14). Another child who had always resided in Georgetown, and was reported not to have previously suffered from malaria, visited his family during August and September, 1928; he suffered from an attack of blackwater at his return in Georgetown early in October, 1928. (Table 1, Case No. 15). The father died from a blackwater relapse in 1930.

Family No. 5.—Name: Bianchi...Residence, Mackenzie. Composition of family father (Italian), two children of mixed blood, and an Aboriginal Indian woman not related by blood to the family. One child and the woman suffered from mild attacks of blackwater in March, 1927. (Table 1, cases Nos. 16 and 17). In the same village, mainly inhabited by Negroes, five other cases of blackwater were observed between December, 1926, and August, 1927. (Table 1, Cases Nos. 18, 19, 20, 21, 22).

Family No. 6.—Name: Gidd...Race, East Indian. Residence, Caria Creek. This locality is a small settlement constituted by two closely situated houses, inhabited by two East Indian brothers with their families of wife and four children, and wife and one child respectively. Of these five children, three suffered from blackwater with an aggregate of four attacks. (Table 1, Cases Nos. 24, 25 and 26).

Family No. 7.—Name: Edmond...Race, Mixed. Residence, Lucky Spot. Composition of family, a widow with three children. All the children suffered from blackwater with an aggregate of five attacks and two deaths. Two of the cases occurred within a few days of one another. (Table No. 1, Cases Nos. 27, 28, 29).

Family No. 8.—Name: DeCl...Race, Mixed. Residence, Coomacka. This house is situated on the right bank of the river directly opposite to the one occupied by Family No. 7, at the distance of some 350 yards. Composition of family, Parents and four children. Three of the children contracted blackwater between December, 1926, and February, 1927. They suffered in aggregate 10 attacks. One died. (Table 1, Cases Nos. 30, 31 and 32).

Family No. 9.—Name: Serret...Race, Mixed. Residence, Akyma. Composition of family: Parents and two children. One child and the father suffered from hæmoglobinuria with a total of three attacks. (Table 1, Cases Nos. 33 and 34).

The recurrence of hæmoglobinuria among members of certain families and in certain houses has been repeatedly noted by numerous workers, who have studied the disease in the endemic area and in the field. For obvious reasons, this has been more frequently the case in countries where a considerable acclimatized or non-immune native population exists, so as to favour the formation of large families.

Tommaselli (1899) has reported cases from Sicily; Deaderich (1914) from the Southern U.S.A.; Millien (1924) from Mauritius; Whitmore (1927) and Menck (1927) from Cuba; Hargreave (quoted by Whitmore) from Jamaica. I first recorded cases from British Guiana in 1930. Even from the West Coast of Africa, cases were recorded by Manson; J. G. Thomsom (1924) in Southern Rhodesia reported on the case of a man and his wife, who both contracted blackwater and died the same day; in another family, three members developed blackwater in the course of one year.

The same author gives considerable attention to the question of "Blackwater Fever Houses," the existence of which appears to be a fairly prevalent belief in Rhodesia. Cort (1929) in Siam has recorded an epidemic of Blackwater in Chieng-

moi, confined to one city block, and to three family connections. A second epidemic occurred in a boys school.

Such occurrences have been variously explained; Millien has suggested the existence of a vector, which could persist and multiply in the house. Thomson found "Blackwater Fever Houses" invariably associated with poor local sanitary conditions, leading to undue prevalence of subtertian malaria. Whitmore, without coming to any definite conclusion, writes: "One must bear in mind the possibility that Malaria is a house disease as suggested by James' studies, and that Blackwater may be more of a house disease than family disease." According to Manson-Bahr, family and house Blackwater "probably is explained by exposure to a common factor." Strickland and Chowdhury attribute the existence of Blackwater in the Darjeeling Terai to a greater local prevalence of Malaria, brought about by the presence of a different anopheline vector, which is more domestic in its habits than the ordinary carrier of the region.

I have reported elsewhere *in extenso* on another malarial disease which is frequent on the Demerara, and which likewise affects children, particularly of mixed blood, and tends to recur in certain families and houses: Malarial Nephritis. I have been able to attribute such an epidemiological peculiarity to house infection with *P. malariae*.

On 42 cases of quartan infection observed in children, 28.5% originated from only five families. On 22 cases of established quartan malarial nephritis, affecting children below 16 years of age, seen at our hospital during the past five years, 12 or 54% originated from these same five families.

P. malariae is a relatively rare parasite in the region, and was only recorded 74 times in 1,775 positive blood films (4.1% of all malarial infections). Under such conditions the synchronous or success-occurrence of *P. malariae* infection, with its late renal manifestations in several members of certain households as has been reported, cannot be the consequence of mere accident, *i.e.*, of repeated casual infection. Given the rarity of the parasite, we must admit, either, that several members of the household acquired their infection at the same time, and therefore in all probability from the same mosquito, or, that the disease may assume the characters of a house disease, one or more of the inmates acting as reservoir of the infection. Anopheles feeding on these subjects and remaining in the house for a period sufficient for the maturation of sporozoites provide for the transmission of the infection to other members of the household. It is possible that both such processes are at work in bringing about this familial or house recurrence of quartan fever. The point that here appears of special interest is that, in either case, *it is the same species and strain of Plasmodium which gets transmitted and persists in the family and the house.* To establish instances of house infection with *P. vivax* or *P. falciparum*, which may be found in practically every house in the district, would evidently be a very much more difficult task.

As I have repeatedly pointed out the epidemiology of Blackwater and of quartan malarial nephritis on the Demerara River is identical in many other respects. It has been shown how Blackwater tends to occur and recur in certain localities, some cases appearing more or less at the same time, or at least within a period which is consistent with what is known to occur in malarial infections, the clinical signs of which may not become apparent for several weeks or even months, if the resistance of the subject is sufficient to counterbalance the invasive power of the parasite. This *localization* of Blackwater attains its maximum expression with the recurrence of the disease in certain households. House infection must be admitted.

Such an epidemiological observation reflects much light on the vexed question of the etiology of Blackwater. House infection leading to Blackwater implies that certain strains of malaria parasites transmitted at the same time, or in succession to different subjects,

have the property of repeatedly producing the Blackwater syndrome. The disease must then be regarded as specifically related to such plasmodial strains, which, in the absence of more complete parasitological information, we can for the present only regard as biological varieties.

Nocht has suggested that Blackwater is due to infection with certain strains of the various malaria parasites, characterized by the biological property of producing haemolysis. Marchiafava and Bignami (1931) are inclined to adopt this view. These authors tend to the opinion that the æstivo-autumnal species includes a number of varieties, mainly characterized by the clinical syndromes they produce. Such varieties would be responsible for the clinical variations which have been noticed particularly in subtertian infections in different countries and different climates.

James' recent work on induced Malaria, to which allusion has already been made, tends to demonstrate the existence of immunological strain variation within the same plasmodial species, and that such variation tends to be related to geographical distribution. It appears in conclusion that the conception of "biological strain," so familiar in bacteriology, subsists equally in the field of malariology.

(5)—MALARIA PARASITES FOUND IN THE BLOOD OF BLACKWATER FEVER CASES.

The parasitology of blackwater is a difficult problem; parasites are not found in the majority of cases; when parasites other than *P. falciparum* are found their relation to the disease is a matter of controversy. Double infection with *P. falciparum* may always be presumed even if not demonstrated; the presence of *P. vivax* or *P. malariae* in the blood is, by many authorities, regarded as a mere coincidence indicating the existence of a concomittant benign malarial infection. As in most cases, the existence of a double infection can neither be proven nor disproven, the argument remains open.

Nocht has suggested that haemolytic strains may exist in all three species of malaria parasites.

In my series of cases, 33.6 per cent. were positive, and 66.4 per cent. were negative for malaria parasites.

An exact specific analysis of positive cases is a matter of difficulty, as the number of parasites found in the films is always small; often only one or two. Large ring-forms are the most frequent, morphologically corresponding to the typical text book description of the early stages of the benign parasites. Even in laboratory routine with films from malaria cases such large ring-forms prevail; more careful investigation and repeated blood examinations have led me to conclude that such forms, in the majority of cases, must be ascribed to *P. falciparum*. Subtertian malaria therefore must be regarded as the prevalent form in the region, and probably also in blackwater cases *P. falciparum* is the predominating form. On the other hand, as I have already reported, the cases of hæmoglobinuria I have seen, associated with *P. falciparum* in its typical form, have all run a more severe course and have suffered a higher mortality: three deaths out of five cases with typical malignant tertian forms; three deaths out of seventeen cases, showing large rings only, or typical benign tertian forms.

(6)—SOME CLINICAL NOTES.

It is not within the scope of this report to study the clinical aspect of blackwater; only some points which may reflect on the epidemiology and etiology of the disease will be mentioned.

(A.) *Sub-Classification of Blackwater.*—In many text-books and papers, blackwater is sub-divided into various nosological entities, which tend to indicate a different etiology and pathogenesis:—blackwater; malarial hæmoglobinuria; quinine

hæmoglobinuria. I have found it quite impossible to follow this or other classification, as in many cases, in successive relapses, occurring in the same individual, the disease tends to show the characters now of one, now of another of the presumed subforms. In families, where the disease has attacked more or less at the same time, or in rapid succession, several members, a similar variability has been observed.

(B) *Malarial History*.—A history of persistent, more or less untreated, malaria was obtained from all cases. It should be noted that the district is one in which malaria is hyperendemic, and a similar history is nearly invariably obtained in the investigation of all medical, surgical, and even traumatic conditions. The question of re-infection has already been mentioned; recent research on immunity and malaria has shown that, in the untreated subject, re-infection with a different parasitic species, or with a different strain of the same species of parasite is more likely to occur than with the same strain. For all practical purposes the great majority of the native population in tropical countries where blackwater occurs may be regarded as untreated.

(C) *Precipitating Factors*.—In most cases no definite precipitating factor could be determined. In others, unusual exertion, exposure to rain or sun, alcoholic excess, appeared to be connected with the onset of the attack.

(D) *Clinical Differences in the Different Races*.—The mixed settled population of the district shows the least degree of immunity to the disease, but also the lowest mortality (21.6 per cent. on 37 cases). The Negroes who as a race show a marked immunity to the disease, when attacked, are nearly always very severely affected and suffer a high mortality (40 per cent. in 10 cases).

(E) *Clinical Characteristics in the Different Age Group*.—In the mixed population of the district, blackwater is much less frequent but more severe in adults; on 34 cases occurring in children the mortality was 17.6 per cent.; on 29 cases concerning adults the mortality was 27.6 per cent.

Blackwater relapses in adults above 20 years have not been very frequent, but still give a high mortality; the following were recorded:—

Case No. 2.	Age 19.	Had three attacks and recovered.
Case „ 3.	Age 20.	Had two attacks and recovered.
Case „ 9.	Age 58.	Was reported to have died from a relapse of hæmoglobinuria.
Case „ 14.	Age 36.	Died in hospital in the second attack of blackwater.
Case „ 48.	Age 29.	Died in hospital in what was reported to be the second attack.
Case „ 63.	Age 65.	Died in hospital in her second attack.

In blackwater fever families the tendency of the disease to attack the children, sparing the adult inmates of the house, is noticeable. The same peculiarity has been observed in the occurrence of quartan malarial nephritis in certain families. Also in Whitmore's cases, only the children and young adults appear to have suffered, while the parents escaped.

Children on the Demerara appear to be three times more liable to the disease than adults, and blackwater tends, as an average, to be less severe, though its tendency to relapse is very nearly more the rule than the exception. When fatal death usually occurs in the first attack; only one fatality was recorded in a relapsing case. The disease remains active for many months, as is indicated by the frequent relapses, but attacks, nearly invariably, tend to become milder, and finally may be remarkably well tolerated. I have frequently known such cases to travel for many miles by open canoe and to walk into the examination room not appearing to be seriously ill, or at any rate not more so than the average relapsing case of chronic malaria. It so happened that, after one or two relapses, the parents would

seldom worry to take the child to hospital, and the little patient would gradually get over the disease and recover just as hundreds of other cases infected with plain malaria were doing at the same time. For this reason the number of relapse attacks recorded for children is without doubt very considerably smaller than the actual figure.

When not fatal in the first attack, the general evolution of blackwater in children is in all respects identical to that of a plain malarial infection; a condition of tolerance or relative immunity appears to be gradually established, evolving to spontaneous cure through a series of progressively milder attacks.

Case No. 11.	Age 4.	Had two attacks and recovered.
Case „ 13.	Age 5.	Had four attacks and recovered.
Case „ 26.	Age 8.	Had two attacks and recovered.
Case „ 28.	Age 7.	Died in his second attack.
Case „ 30.	Age 9.	Had two attacks and recovered.
Case „ 31.	Age 6.	Had six attacks and recovered.
Case „ 33.	Age 10.	Had two attacks and recovered.
Case „ 43.	Age 4.	Had two attacks and recovered.
Case „ 56.	Age 12.	Had three attacks and recovered.
Case „ 57.	Age 12.	Had two attacks and recovered.
Case „ 58.	Age 5.	Had eight attacks and recovered.

In all these cases the hæmoglobinuric attacks alternated irregularly with simple fever attacks. After the occurrence of the last blackwater relapse, fever usually persisted for some time with frequent but mild attacks. At present most of the cases observed in 1927 and 1928 enjoyed good health, have had no blackwater for several years, and are not much troubled with malaria, though usually presenting palpable spleens. The stage of relative immunity has been reached.

Such spontaneous clinical cures and such a condition of relative immunity do not imply a cure of the infection. On the contrary, the evidence tends to prove that the infection persists though the subject is free from its clinical manifestations; though himself in apparently good health, he may represent a potential reservoir for further spread of the disease. This at least we know to obtain in the case of ordinary malarial infection, and there is no reason to doubt that similar conditions should equally subsist for the special strains which cause blackwater. The long latent survival of blackwater infection is evidenced by the long intervals which frequently separate successive relapses, particularly in adults. Case No. 14 had his second and fatal blackwater attack three years and two months after the first. In blackwater families, a year or more may elapse between the appearance of successive cases.

(F) *Relation of Blackwater to Quinine.*—In many of the cases seen the history was negatived on this point. In others quinine had been taken but always in insufficient doses; treatment had always been irregular as is constantly the case with natives outside hospital. No cases of blackwater were observed to develop in patients undergoing treatment for malaria or other diseases in Hospital. Most relapses which occurred outside the hospital were independent from the taking of quinine; the population is by far better informed on the possible dangers than on the inestimable benefits which quinine can produce. The relation of the drug to blackwater and to abortion is common knowledge and greatly exaggerated; for a long time I found it very difficult to persuade cured blackwater cases and pregnant women to make use of quinine.

Blackwater cases which had had quinine after the onset of the attack appeared to me to run in most instances a more severe course. Many relapses observed in hospital were undoubtedly brought on by quinine. On the contrary, in all cases preliminarily treated with Stovarsol, and later with Plasmoquine and Stovarsol,

during the acute stages of the disease, quinine, if administered carefully, and in gradually progressive doses, could be given with impunity and benefit during convalescence.

(7) IMMUNITY IN BLACKWATER FEVER.

Immunity plays a part of first importance in the epidemiology of blackwater. Nearly all those who have worked on this disease, in the endemic area, have noted its tendency to spare certain portions of the population while others are seriously attacked. Immunity, susceptibility, liability, are all familiar terms in the literature of malarial hæmoglobinuria.

The study of immunity in blackwater is a task of enormous difficulty, as the disease can only be recognized by the actual observation of hæmoglobinuria. In individual cases, in the absence of the typical syndrome, it is impossible to speak of immunity, as we have no elements to determine if the individual has or has not been exposed to the factors necessary for the provocation of the disease. It is only by studies carried out on the mass, and by indirect methods, that this problem can be tackled.

The following is a brief summary of some data collected from the literature and from my own observations :—

- (1) The native population of countries where blackwater is endemic and common shows a marked immunity to the disease.
- (2) Immigrants to the endemic area from blackwater-free countries are non-immune to blackwater. In Africa, this has been found to apply also to Negroes coming from healthy areas. (Plehn).
- (3) Negroes show a distinct racial immunity to blackwater. (Deeks and James in Panama, Menck in Cuba, Giglioli in British Guiana). Such immunity is doubtlessly increased in Negroes who are native of the endemic area. (Thomson in Rhodesia).
- (4) In British Guiana, blackwater occurring in Negroes tends to run a severe course, and to give a relatively higher mortality than in the other races.
- (5) Children of all races in British Guiana are much more liable to blackwater than adults. In blackwater fever families, though presumably exposed to infection in an equal degree, the adults of the family are more rarely affected than the children. In adults the mortality is higher than in children and tends to remain high also in relapsing attacks.
- (6) In children, if not fatal in the first attack blackwater tends to spontaneous cure through a series of progressively milder hæmoglobinuric and plain fever attacks. In spite of the great frequency of relapses, death from blackwater in a relapse is exceptional. Such a process suggests a tendency to develop a state of tolerance or relative immunity.
- (7) The more serious characters of blackwater, affecting Negroes and adults from the endemic area, both of which as an average show a considerable degree of immunity to the disease, tend to suggest that the occurrence of the disease may be due to factors pertaining to the individuals, which, by lowering the natural or acquired immunity, should favour the explosion of the disease. If such is the case, the distribution of blackwater cases in a Negro community, or among adult inhabitants of the endemic area, would tend to have an irregular and sporadic distribution; cases occurring when and where impaired individual conditions tending to break down the natural or acquired immunity would allow the explosion of the typical clinical manifestation of the infection.

All these points tend to demonstrate that veritable immunity to blackwater exists, and that it presents the same form and the same limitations which obtain for malaria and malarial infections,

In the Negro, in the West Indies at least, we are bound to admit a primary racial immunity independent from residence in the endemic area. Such a condition is not surprising, as the Negro, without being immune to malarial infection, tends to present a very considerable tolerance or relative immunity to most of the clinical manifestations of malaria.

It is reasonable to believe, according to African experience, that the immunity of the Negro may be further increased when he is a native of highly endemic regions.

In other races immunity is less distinct and presents the characters of acquired immunity. In the non-negro acclimatized population settled in the endemic area, adults show a considerable degree of immunity. Here again we find a condition closely corresponding to what we know to be the case with ordinary malaria. The evolution of the disease in children similarly corresponds to that of an ordinary malarial infection.

The mechanism by which adults acquire their immunity to blackwater is a question of interest and three different processes suggest themselves:—

- (a) Through having suffered from blackwater during childhood;
- (b) Through sub-clinical infection with a hæmolytic plasmodial strain during childhood. As all other malarial infections may occur and evolve without giving rise to any of the usual more marked clinical manifestations of the disease, it is presumable that infection with a hæmolytic strain may subsist and evolve without provoking the typical blackwater attack;
- (c) Through "group immunity," due to immunity acquired through infection during childhood, with the ordinary malarial parasites.

On the Demerara the first of these processes can be easily excluded, as blackwater under ordinary circumstances is a relatively rare disease. It is probable that both the other mechanisms suggested play their part, but as infection with hæmolytic strains, without blackwater, cannot be distinguished from ordinary malarial infection, it is quite impossible to come to any definite conclusion.

These observations on immunity in blackwater are fragmentary, but they tend to define what immunity in blackwater really is. They indicate, moreover, what enormous variation may and does occur in the incidence and epidemiology of the disease according to the conditions of immunity of the population in which the disease is studied. Between the two extremes presented by the Rhodesian Negro protected both by racial and acquired immunity and by the unacclimatized or poorly acclimatized European immigrant in the same region, who possesses neither, we find intermediate conditions as those I have described, where a population racially non-immune tends to acquire immunity by protracted residence in the endemic area and by infection during childhood. It is under the latter conditions only that the typical epidemiological characteristics of the disease stand out in evidence, and that its etiological relation to a "*sui generis*" malarial infection becomes apparent.

CONCLUSIONS.

1. The epidemiology of blackwater fever in the settled population of the mid and upper Demerara has been studied over a period of nine years. The District, with its population of approximately 6,500 inhabitants (1931), comprising different races, living under uniform conditions, in a very restricted area, presents an ideal field for research, as the numerous complex factors which directly or indirectly may be related to or influence the epidemiology of the disease can be more easily detected, more thoroughly investigated, and more exactly valued.

2. Blackwater is not a common disease on the Demerara River; its incidence is related to that of malaria.

3. Blackwater is not specially related to chronic malaria. It appears on the contrary when anopheles are unduly abundant and recent malarial infections prevail. When conditions for the transmission of malaria are not favourable, and chronic infections with relapsing cases prevail on new infections, blackwater tends to disappear.

4. The distribution of blackwater cases in time and space is not casual; cases tend to occur and recur within a limited period of time and in certain localities.

5. This place and time limitation in the distribution and occurrence of blackwater cases attains its maximum expression in *family* and *house blackwater*, conditions which have been recorded by numerous observers from various parts of the world. This is a distinct characteristic of the disease in the mixed settled population of the Demerara; on a population of 6,500 approximately 63 cases of blackwater were recorded, 36% of which originated from only nine families. Malarial Nephritis, another disease which I have found common in the region, like blackwater, attacks children in preference and tends to recur in certain families and houses. I have easily been able to trace the cause of such occurrences to house infection with *P. malariae*, which is relatively a rare malarial parasite in the region. On general epidemiological grounds and by analogy with what I have observed in quartan Malarial nephritis I ascribe the familial and house recurrence of blackwater to house infection.

6. Under similar conditions of life and of exposure to malarial infection all races have been noted to develop the disease, but Negroes are very much more rarely affected. This was observed not only in Negroes settled in the endemic area, but also in Negroes from Georgetown and the Coastlands and in immigrants from the more mildly malarious West Indian Islands.

7. The incidence of blackwater in children in all races was found to be about three times as great as in adults. In children the disease is on the average less severe and causes a lower mortality. Relapses tend to be more the rule than the exception, but the mortality is very low in relapsing cases (only one fatality in 11 cases, given an aggregate of 35 attacks). Successive relapses tend to become gradually less severe, as if the development of a condition of tolerance or relative immunity were in progress. Plain fever attacks alternate irregularly and usually persist for some time after the last attack of hæmoglobinuria.

8. Adults of the acclimatized settled population of the endemic area show a considerable degree of resistance to the disease. In house or family blackwater, as in house quartan malarial nephritis, it is the children who are attacked with greatest frequency. Adults when attacked are more severely affected and suffer a higher mortality.

9. Considering :—

- (a) That blackwater appears when favourable conditions for the transmission of malaria prevail and new infections are rife;
- (b) That the disease tends to recur in certain localities, attacking a number of persons within a limited period of time;
- (c) That it is capable of causing house infection, *i.e.*, the disease may be transferred from one member of a household to another, still maintaining its hæmoglobinuric character;
- (d) That in children, if not fatal in the first attack, it evolves through a series of progressively milder attacks tending to spontaneous recovery with a process identical to that of a simple malarial infection, to which tolerance or relative immunity is gradually developed; I am led to conclude that blackwater is neither a complication of malaria, nor a reaction to chronic malarial infection, but is itself a form of malaria, specifically related to certain strains of malaria parasites so far morphologically not distinguishable from the ordinary forms.

10. Immunity in blackwater appears to present the same general characteristics of immunity in malaria. Its study is extremely difficult owing to our inability to distinguish hæmolytic plasmodial strains from the ordinary forms of malaria parasites. Immunity to blackwater subsists under two distinct forms:—

- (a) Racial immunity: This is most apparent in the Negro race and is independent from residence in the endemic area. It may be regarded as a phase of the relative immunity which this race enjoys to the more serious clinical manifestation of malarial infections. This does not in any way imply immunity to infection; there is no reason to believe that the Negro should enjoy immunity to infection with hæmolytic plasmodial strains; one need only admit that, when infected, he should not usually react with the typical hæmoglobinuric syndrome. Though not commonly a victim to the disease he must be regarded as a reservoir of the infection for non-immunes;
- (b) Acquired immunity: Manifests itself directly in the evolution of the disease in children, indirectly, by the greater rarity of the disease in the adult sections of the settled population of the endemic area.

11. The epidemiology of blackwater in conclusion is essentially governed by two factors:—the distribution and the incidence of the specific strains which are the primary etiological factors of the disease and the conditions of immunity of the population. In individual cases it is the latter which will decide if infection will or will not be followed by the typical syndrome—Blackwater.

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