

Report on the outbreak of plague at Fremantle.

Contributors

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1903.

WESTERN AUSTRALIA.

with dr. 3288

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REPORT

ON THE

OUTBREAK OF PLAGUE

AT

FREMANTLE.

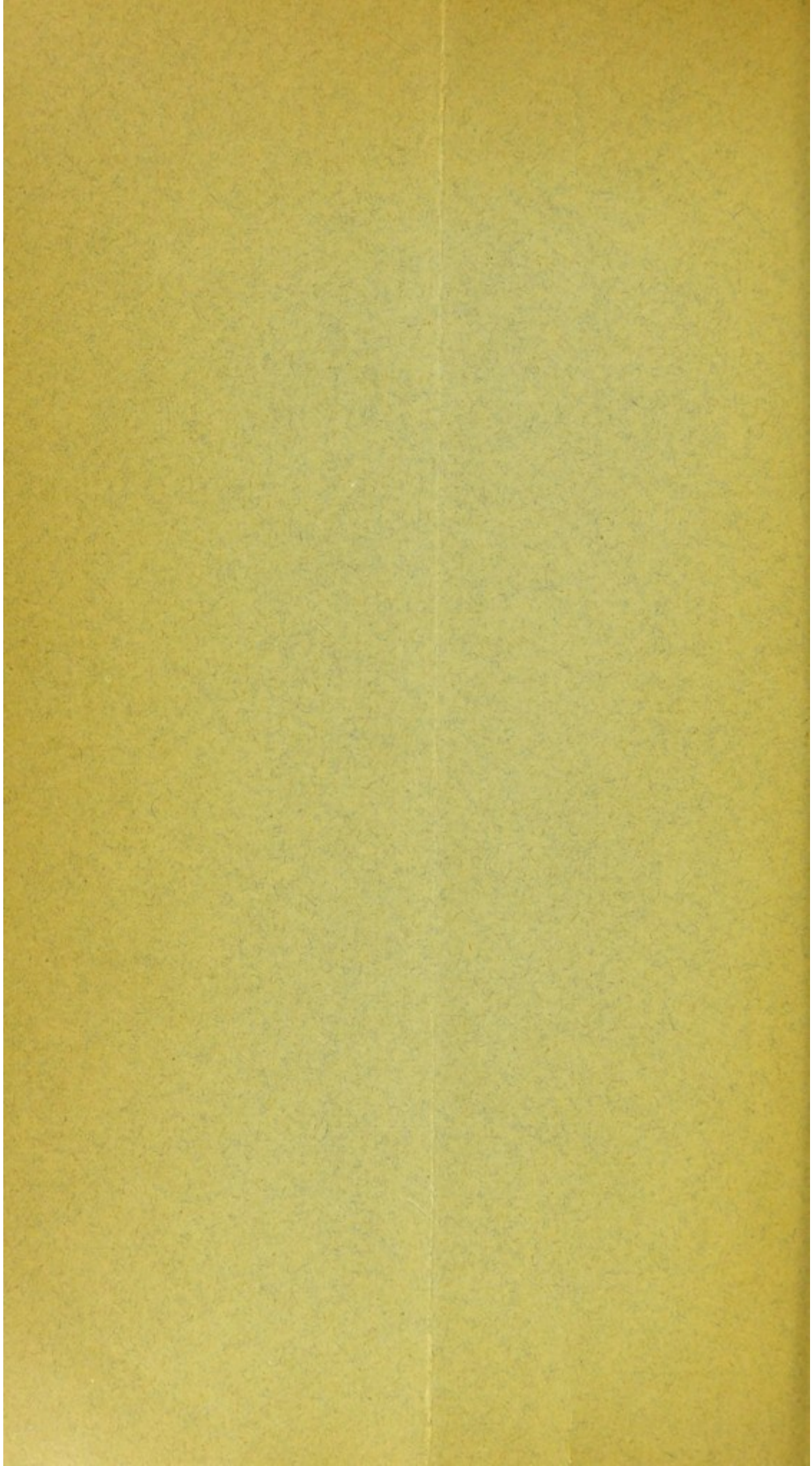
JANUARY—MARCH, 1903.

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R E P O R T

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OUTBREAK OF PLAGUE AT FREMANTLE.

JANUARY—MARCH, 1903.

*To the Honourable the Colonial Secretary from the Acting President
of the Central Board of Health.*

The outbreak consisted of eight cases, with four deaths. It began on January 24, when a youth working and living at an eating-house fell ill. On the 26th the case was reported to our local medical officer, Dr. Anderson, who pronounced it plague, and reported it to us. The cumbrousness of the procedure laid down for declaring a place infected was on this occasion very apparent. The day was a public holiday, and only one member of the Central Board was immediately available, and only one other late in the evening. As a consequence, the secretary and myself had to go to a distant suburb in the evening, and after some difficulty we obtained a quorum at the residence of one of these members. Thus the place remained open during the afternoon and evening of the 26th, and was not quarantined till the next morning. This seems to point to an omission in the Act. Nine "contacts" were removed into segregation, and next morning one was observed to be ill. He was a young man, living and working under the same conditions as the first patient. It was thought at first his condition might be the result of inoculation, but as he had a considerable temperature he was sent to the hospital, and eventually died of plague on the 29th. Later in the same day as the last, another "contact," a waitress at the shop, showed symptoms of illness, and was also sent to the hospital, where she passed through a mild attack of plague.

Thus the outbreak really began with three cases at this place. There was then the usual lull, followed by another case reported on February 13th, in the person of a tailoress, employed in a detached

room at the back of a tailor's shop near the corner of High and Henry Streets, and living in a suburb with her parents and the rest of the family. These "contacts," to the number of six, were sent to quarantine. She passed through a severe attack, but recovered. Three days later another case was reported—a yardman employed and living at a hotel at the corner of Mouatt and Phillimore Streets. The hotel was at once closed and quarantined, and the occupants, numbering 15, segregated. This patient died the following day. The next case was reported on 19th—a youth employed in a hardware shop and warehouse, corner of High and Mouatt Streets, and living in a suburb. The seven members of the family were removed as contacts, and both premises disinfected. He eventually died on February 24th. These three cases seem to have been the climax of the outbreak. The next was reported five days later—a very mild one—a man out of employment, living in a common lodging house, who had been ill for five days. All the other occupants were sent out as "contacts" (26). The next and last case was reported two days later—a nightman working all over the West Ward, and living in a suburb. He died two days later. In Appendix I. is a table showing cases, etc. I have included the column "cases among contacts," because it is usually given; but I think it misleading. It might seem to imply that they occurred *because* they were contacts, which is not the case.

There have been no further cases to date (24th March, 1903), though a few infected rats are still being found.

As we have not the means for making extensive bacteriological investigations, we only confirmed in one case. A guinea-pig was inoculated with an agar culture made from gland of first fatal case (second case), and died in four days with very typical plague.

It will be seen that the outbreak was short and sharp—eight cases (of which four died) within a month—one of the highest mortalities in Australia; but the disease has always appeared in a severe form in this town, the mortality generally being from 50 to 100 per cent.

RATS.—Energetic measures were taken to exterminate rats. When the first case occurred, there was the usual statement that there were no rats in the place; but when the patient recovered he stated that it was overrun with them. The two men were sleeping, with others, in rooms in the back yard, which were infested with vermin, judging by the clothes, etc., in the rooms. These rooms also abutted on a shed, which had an old and broken floor nailed on

to joists laid on the ground, and was used for storing wood, fish-baskets, etc., and was an ideal hunting ground for rats. Similar conditions seemed to prevail in many parts of the town, which is a mixture of old buildings, new buildings, dilapidated shed and outhouses, etc.; and the condition is aggravated by a tendency to keep small stables and fowl sheds, which both ought to be prohibited in the town.

During the outbreak 471 rats were examined, and 99 of them found infected. The worst rat infection appears to have been during the week ending 15th March, 1903, when, of 65 rats examined, 29 were infected.

MEASURES TAKEN.—These, besides the rat extermination already mentioned, comprised inoculation, isolation, disinfection, and general cleansing. The local board of health were good enough to place one of their rooms at our disposal, and this was used as an office for the extra staff of inspectors and rat-catchers who were put on under Inspector Stevens, and also for public inoculation, which was provided free of charge; and 2,450 persons availed themselves of it, besides 265 who were done privately by the general practitioners. The rat-catchers were employed in laying baits and traps all over that part of the town; and the inspectors patrolled every block to see that all rubbish was removed and nuisances remedied as rapidly as possible, and the local board was induced to put on extra carts and men for that purpose. The Central Board provided all local boards with phosphorus paste for destroying rats. Seven premises were disinfected and cleansed. The shipping regulations in this connection were strictly enforced, and an extra staff of inspectors put on for the purpose, and also for inspecting goods leaving the wharf after lying there, as many infected rats had come from that vicinity. In the same way, an inspector was put on at the river wharf at Perth to examine goods lightered up the river.

GENERAL.—The facts of this outbreak would appear to emphasise the point that plague is rarely caught from pre-existing cases. It never has been in this State, and therefore the system of wholesale contact segregation would appear unnecessarily stringent, and might be replaced by supervision, persons simply being offered quarters during the disinfection of their homes, and being allowed back immediately on its completion. As to the origin of the outbreak, there appears to be some idea that it was re-introduced from without, but this does not appear to me to be likely. The

disease has appeared in Fremantle each year; so why should it require a re-introduction this year? The last case in Australia was on the 24th November, 1902, at Townsville, and no boat comes direct from there. The last case in Brisbane was on 15th August, 1902—rather a remote date. Of course there is the possibility of its coming from Asia in spite of the strict supervision exercised. The former conclusion, that good ordinary municipal sanitation is the best preventive of plague, appears confirmed. Unfortunately, the outbreak does not throw any further light on the relation of rat and man in the epidemiology of plague. The first infected rat was not found till February 2nd—nine days after the first case had occurred, and only after 30 rats had been examined. The patients did not catch the disease from each other, and the rats did not catch it from them, as they were always removed before they could become infectious. Therefore, seeing that rats were suffering from plague practically synchronously with man, it seems fair to infer that the latter took it from the former, though there remains the possibility that both got it from some common source.

G. H. S. BLACKBURNE,

Acting President, Central Board of Health.

Appendix I.

Name.	Age.	Occupation.	Residence.	Place of Work.	Date of onset of illness.	No. of Contacts.	Cases among Contacts.	Result.	Date.
Hugh Murray ...	19	Waiter	Corner of Market and Bannister Streets	Corner of Market and Bannister Streets	24-1-03	Discharged	7-3-03
Nicholas Buicich ...	20	Waiter	Corner of Market and Bannister Streets	Corner of Market and Bannister Streets	27-1-03	9	2	Death ...	29-1-03
Lucy Butterworth ..	23	Waitress	...	Corner of Market and Bannister Streets	27-1-03	Discharged	7-3-03
Rosabella Swales ...	15	Tailoress	Hubble Street, E. Fremantle	Batger's, High Street	10-2-03	6	0	Discharged	24-3-03
Percy Cartwright ...	27	Yardman	Hotel, corner of Mouatt and Phillimore Streets	Hotel, corner of Mouatt and Phillimore Streets	15-2-03	15	0	Death ...	18-2-03
Norman Ravenstrunch ...	15	Clerk	Bellevue Terrace, Fremantle	Sandover's, corner of High and Mouatt Streets	17-2-03	7	0	Death ...	24-2-03
James Gardner ...	52	Ship steward	103 Phillimore Street	Alhambra restaurant, Henry Street	19-2-03	26	0	Discharged	24-3-03
Victor Hague ...	26	Nightman	Douro Road ...	In Fremantle, West Ward	24-2-03	2	0	Death ...	28-2-03

Appendix II.

CLINICAL REPORT ON THE OUTBREAK OF PLAGUE, IN 1903, AT FREMANTLE.

The outbreak was confined to eight persons. The first case was diagnosed on January 26th, and the last on February 26th; the last patient was discharged on March 24th.

Sex.—6 males; 2 females.

Age.—Between 10 and 20 years 3 cases.

" 20 30 " 4 "

" 50 60 " 1 case.

Mortality.—4 of the 8 patients died, giving a mortality of 50 per cent.

Mortality in previous outbreaks:—

1900	...	6 cases	...	3 deaths	...	50 per cent.
1901	...	23 "	...	5 "	...	21 "
1902	...	3 "	...	3 "	...	100 "
1903	...	8 "	...	4 "	...	50 "

The average period in hospital of those who recovered was 37 days.

Mode and Source of Infection.—This is merely a matter of conjecture. All that can be said is that the patient lived or worked in places where or near which infected rats were found; but how the infection was transmitted from the rat to the human being cannot be stated. The first three cases showed many flea bites; and all stated that the premises were infested with vermin. Four of the cases lived and worked in infected areas; the other four worked there only. The rat infection is dealt with in the general report, but a reference to the accompanying map will show the relationship between the location of infected rats and the occurrence of cases of plague.

Form of Plague.—All the cases were attended with the formation of buboes—bubonic type of plague.

In six cases the femoral region (three on right side and three on left side), in one case axilla, and in the other the inguinal region were the sites of the bubo. In two cases the buboes were multiple—in one case, right axilla and supra-clavicular region, and in the other in left femoral and right cervical region. Suppuration occurred in two of the four cases that recovered; and the plague bacillus was demonstrated in the pus in each case.

In seven cases the bubo was easily felt when patient was first seen, and, according to patients' statements, developed in from 24 to 36 hours after onset of illness. In one case the development of the bubo could be watched, and this took 36 hours to reach its full

size—from being a thickened cord to a lump as large as a walnut. In all cases in which the femoral or inguinal regions were affected, a distinct swelling could be felt in the iliac fossa along the course of the external iliac artery. This was regarded as a valuable diagnostic sign. Erythema of the skin over the bubo, which was present in three cases, is also of some diagnostic importance.

Incubation Period.—This could not be definitely made out in any case, owing to the uncertainty as to when infection actually occurred.

Onset.—In all cases sudden and acute. In one case only, a rigor at commencement. The usual symptoms—headache, vomiting or nausea, pains in back and limbs, with sharp pain at site of future bubo. Temperature rose rapidly: in two cases it was 105·8 degrees when cases were first seen; in the ordinary severe attack it ranged from 100 to 120 degrees.

Course.—The usual symptoms of an acute febrile attack were present. Headache was severe and persistent in one case. Delirium of an acute character was present in five cases; in another case *delirium tremens* developed and rapidly hastened patient's death. In the seventh case delirium was very mild, whilst the eighth case was never delirious. The highest temperature recorded was 106·8°, half an hour before death. Another case rose to 106·4° before death. The temperature ran no definite course as in typhoid, but after ranging between 101° and 105° for four or five days, reached normal in from six to eight days; termination was either by *crisis* or by *lysis*. The pulse varied from 88 to 160. In one case it was never below 120, and was at times 150 to 160. In five cases a rash was present on the arms and legs; and also on the face in two of the cases. This rash consisted of small, dark-red spots, just to be felt by the finger, and not wholly disappearing on pressure. In one case a petechial rash appeared on both arms some hours before death. The spots came out in successive crops, remained for about two days, then began to fade, and left a faint brown stain on skin. Vomiting did not persist after the onset. Constipation was the general rule. Tongue was always furred, with clean, red tip and sides. *Epistaxis* occurred in one case, but was not severe. Speech was markedly affected in three of the cases, being of a hesitating, broken character.

Complications.—One case developed a broncho-pneumonia—two patches of consolidation in the left lung towards the base.

Diagnosis.—The clinical diagnosis of plague was confirmed by microscopic examination of material from the buboes in the living, and by the *post mortem* appearances and microscopic examination in the fatal cases. Cultures made from the fatal cases inoculated into guinea pigs produced death in four to five days from plague; and the cultures from the animal showed the same bacillus as at the beginning. The same bacillus was discovered in the buboes and spleens of certain rats.

Morbid Anatomy.—The four fatal cases were all examined *post mortem*, and all presented certain general appearances. *Post mortem* staining and discoloration were rapid and marked. *Rigor mortis* set in early. The skin, on being reflected from the bubo beneath, was found much congested: the tissues about the buboes were intensely congested and hæmorrhagic, the glands were found enlarged, and on section was of a dark red colour. In one case the glands were much enlarged, and in a foul, sloughy condition. The heart was relaxed and dilated. Broncho-pneumonia was met with in one case. The spleen was large, soft, and friable. Liver slightly enlarged, and in one case very pale. Smears from the spleen showed the bacilli in great numbers.

Treatment.—Careful and judicious stimulation with good nourishment were the lines of treatment. The condition of the heart was always carefully watched, and appropriate remedies given when circumstances required. Ichthyol with glycerine of belladonna was applied to the bubo, if painful. As soon as signs of suppuration appeared the bubo was incised.

T. L. ANDERSON,
Special Medical Officer, Fremantle.

31st March, 1903.

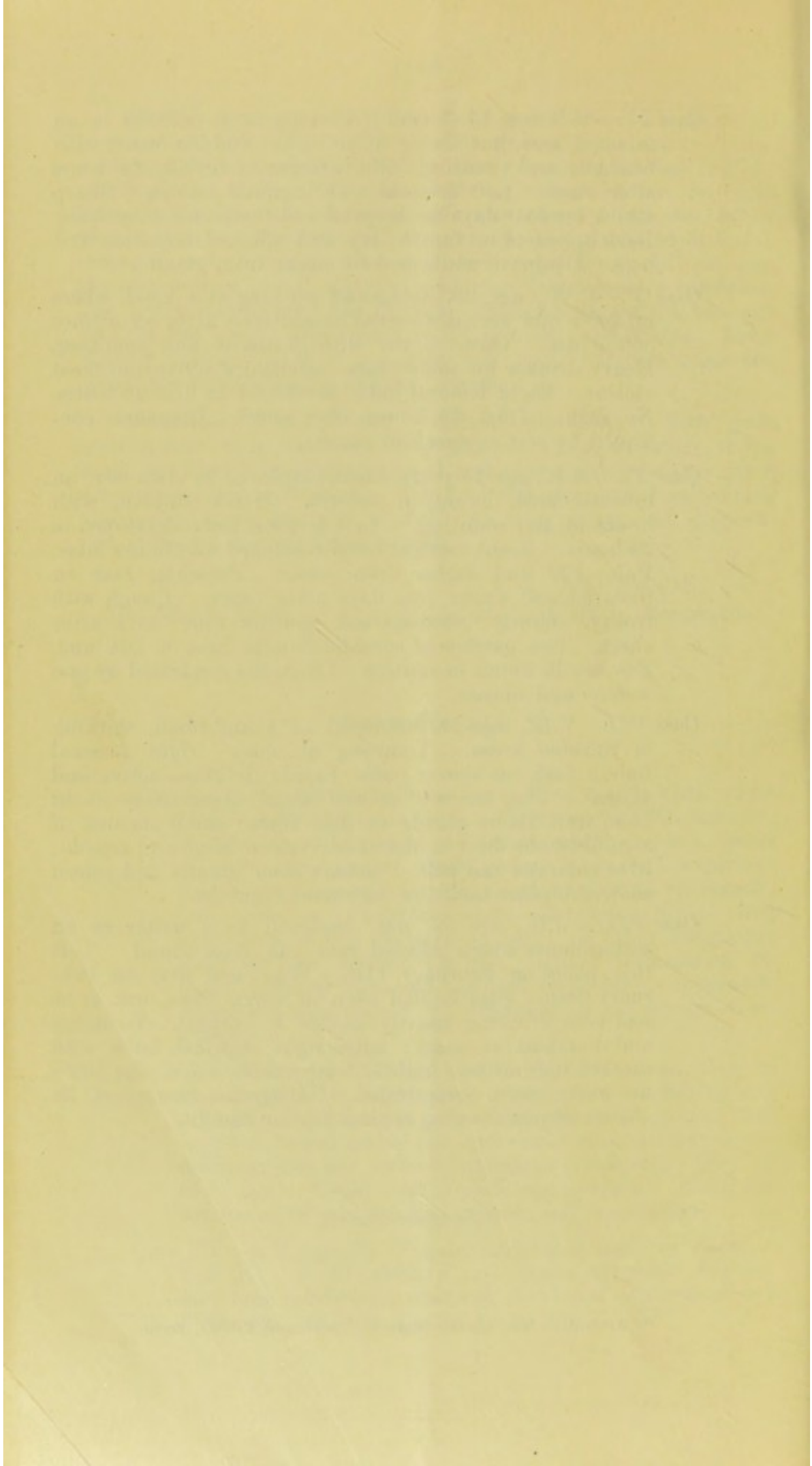
Appendix III.

Case I.—H.M., age 21 years, waiter. First case in 1903. Two other cases from same place. First seen on 26th January; then had been ill two days. Onset sudden; nausea; pains all over body and in right groin; headache; vomiting; speech stammering; talkative and wandering in speech; few spots on forearms; bubo developed when first examined; many fleabites on legs; no other abrasions; delirious and excited for two nights; termination by crisis; femoral bubo and inguinal bubo both suppurated. Diagnosis established by examination of smears from glands.

Case II.—N.B., age 19, living and employed at same place as Case I. Sudden onset; high temperature; vomiting and diarrhœa; left femoral bubo developed in 12 hours; eyes injected; rapid pulse and quickened respirations; active delirium, but not violent; diarrhœa persistent. Died on fifth day. Usual *post mortem* appearances. Diagnosis confirmed by *post mortem*, culture, and inoculation.

Case III.—L.B., age 23 (female), employed same as Cases I. and II. Right axillary and supra-clavicular buboes; diarrhœa persistent; rash well developed on forehead and forearms; delirium, but not very acute.

- Case IV.*—R.S., age 15 (female), working as a tailoress in an infected area, but living in suburb. Sudden onset, with headache and vomiting. Bubo began to develop 24 hours after onset. Left femoral and inguinal buboes. Sharp attack for four days in hospital and termination by lysis. Rash appeared on fourth day, and affected forearms and legs. Diagnosis confirmed by smear from gland.
- Case V.*—P.W., age 26, living and working at a hotel, where infected rats were discovered immediately after occurrence of the case. Onset acute, with headache and vomiting. Heavy drinker for some years. Delirium active and most violent. Right femoral bubo developed in first 24 hours. No rash. Died 48 hours after onset. Diagnosis confirmed by *post mortem* and smears.
- Case VI.*—N.R., age 15 years, clerk, employed in town near an infected area, living in suburb. Onset sudden, with headache and vomiting. Left femoral bubo developed in 24 hours. Right cervical bubo developed four hours later. Pulse 120 and higher from onset. Petechial rash on forearms and wrists four days after onset. Cough with frothy, slightly blood-stained sputum four days after onset. Two patches of consolidation at base of left lung. Few bacilli found in sputum. Diagnosis confirmed by *post mortem* and smears.
- Case VII.*—V.H., age 25, employed as a nightman, working in infected areas. Vomiting at onset; right femoral bubo; rash on arms; pulse rapid; delirium active and violent. *Post mortem* showed usual appearances about bubo and about glands in iliac fossa; small amount of sero-fibrinous fluid in abdomen; spleen large and friable; liver enlarged and pale. Smears from glands and spleen showed bipolar bacilli in enormous numbers.
- Case VIII.*—J.G., age 52, was employed as a waiter at an eating-house where infected rats had been found. Left this place on February 11th. Was seen first on February 24th. Said he had been ill seven days, but as he had been drinking heavily cannot be certain. Vomiting and diarrhoea at onset; large right inguinal bubo with marked induration; highest temperature noted was 102°; no rash; bubo suppurated. Diagnosis confirmed by smears of pus showing typical bipolar bacillus.





H. J. Pether, Government Photolithographer, Perth, W.A.



SOUTH B.A.



