

(No. 96.)



1889.

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PARLIAMENT OF TASMANIA.

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CENTRAL BOARD OF HEALTH:

REPORT FOR 1888.

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Presented to both Houses of Parliament by His Excellency's Command.



TO THE HONOURABLE THE CHIEF SECRETARY.

*Central Board.*

PUBLIC HEALTH ACTS, 1885 AND 1887, (49 VICT. NO. 18 AND 51 VICT. NO. 35.)

The following Table shows the number of deaths from these diseases in the periods mentioned, the Victorian figures for typhoid for the decade 1878-1887 being given for purposes of comparison. Similar figures for diphtheria are not available:—

As these diseases are held to be preventable ones, or, in other words, as the 127 deaths that were attributed to them might have been prevented had the causes originating the diseases been removed, a heavy responsibility rests on all sanitary authorities, and therefore a great part of our attention has been directed towards the assisting of Local Boards of Health of the districts most affected to check the spread of infection where it actually existed, and to get rid of the sources of it by improving the sanitary condition of houses and their surroundings.

3. The notification of infectious diseases, as provided for by the 10th Section of "The Public Health Act, 1887," is still very imperfectly carried out, except in Launceston and in the General Hospitals of Hobart and other towns. This is much to be regretted, as it is only by early information of the occurrence of cases that the sanitary authority of the district is enabled to discover and remove local causes of disease. Though some cases of default have been reported, no legal action has been taken by any Local Board against any medical practitioner to enforce the provisions of the above-mentioned Section, and it is to be hoped that none will be necessary.

*Typhoid Fever.*

4. The following Table completes for the whole year the information given for the first six months of it in a corresponding Table in our Interim Report of the number of cases of typhoid and continued fever reported, and the deaths therefrom registered, in each month :—

<i>Months.</i>	<i>Cases reported.</i>	<i>Deaths, 1888.</i>	<i>Deaths, 1887.</i>
First six months.....	408	68	82
July.....	29	3	10
August.....	21	0	6
September.....	13	5	4
October.....	14	1	4
November.....	14	2	4
December.....	48	5	2
Total for the year.....	547	84	112

It is shewn in the Table in paragraph 2 that these 84 deaths represent a mortality from these fevers of 5·83 of each 10,000 living. And the highness of this rate may be shewn by the consideration that while the general rate of mortality in Tasmania is much lower than in England, the rate of mortality from these fevers is more than double the rate in England, the figures for each 10,000 living being—

In England, 1887,\* General death-rate, 188·0 ; Typhoid death-rate, 2·07.  
In Tasmania, 1888, „ 141·1 ; „ 5·83.

And the Tasmanian rate for 1887 was still higher.

This high death-rate is still further aggravated by its incidence. Of the 84 deaths 68 were of persons between 15 and 50 years of age, only 11 being below 15, and 5 above 50. Thus, here as well as elsewhere, typhoid fever selects its victims chiefly from among those who are in the full vigour of life—those whose lives in their own circles are the most precious.

In a Special Report, dated September, 1887, by the Central Board of Health of Victoria on the prevalence of typhoid fever in that colony, the following passage occurs, and well describes the general apathy with which the question is treated :—“ But it may be asked, how is it that a disease ‘altogether and easily preventible,’ as Dr. Parkes puts it, should be allowed to go on killing hundreds and disabling thousands one year after another, not only without intermission, but occasionally with increasing severity? The question is one which may well receive the earnest attention of Local Boards throughout the colony. When a railway accident occurs through carelessness or stupidity the heart of the community is shocked at the terrible calamity, and energetic measures are taken at once to ascertain the cause, and prevent the occurrence of a similar disaster. But although there is no comparison between the loss of life by a railway accident and that from typhoid fever in this colony, and further, although the one occurs only occasionally, while the other has been in operation for years, yet, notwithstanding these points of difference, the greater evil, which works silently and unseen, is allowed to go on with increasing prevalence, while the less but more sudden and startling calamity is taken in hand at once. Both evils are preventible, at least to a large extent, and both concern human life. How is it, then, that so much is done to prevent the one, and so little to stamp out the other?”

*Diphtheria.*

5. The following is a continuation of the Table of cases of diphtheria given in our Interim Report :—

<i>Months.</i>	<i>Cases reported.</i>	<i>Deaths, 1888.</i>	<i>Deaths, 1887.</i>
First six months.....	103	22	20
July.....	7	5	2
August.....	12	4	2
September.....	20	4	2
October.....	7	6	5
November.....	9	1	0
December.....	6	1	3
Total for the year.....	164	43	34

The Table in paragraph 2 shows that the deaths from diphtheria in Tasmania for each 10,000 of the population were 2·98. In 1887 the deaths in England for each 10,000 of the population

\* Last Return available.

were 1·57. As diphtheria is a disease that is most prevalent in moist climates, this comparison shows how much sanitation has done for England.

*Scarlet Fever.*

6. The following table completes the returns for the year of cases of scarlet fever :—

<i>Months.</i>	<i>Cases reported.</i>	<i>Deaths, 1888.</i>	<i>Deaths, 1887.</i>
First six months .....	157	1	2
July .....	41	2	...
August .....	36	...	...
September .....	19	...	...
October .....	27	...	...
November .....	18	1	...
December .....	19	1	...
Total for year .....	317	5	2

The death-rate in Tasmania from scarlet fever compares very favourably with that in England, the rate in Tasmania being 0·34 to 10,000 living, while that of England is 2·78 in the same number.

*Smallpox.*

7. Two cases of smallpox occurred during the latter half of the year, and will be referred to in connection with the proceedings of the Local Board of Launceston (Section 47). In an Appendix we publish, at the request of some members of the medical profession of the Colony, the hospital notes of the cases that were treated last year at the Mowbray Hospital, Launceston, by Dr. Pardey, who has kindly placed them at our disposal.

*Meteorological Distribution.*

8. An examination of the above tables and those given in our interim Report, together with the meteorological observations published by the Statistician, will show that in regard to typhoid fever a distinct meteorological influence can be traced this year as in the past. With respect to temperature, as far as it could affect the disease of the year, the highest mean readings of the thermometer were in January, and were followed in February by the highest number of cases reported, and, in due course, in March by the highest number of deaths registered. It is also to be noted how the exceptionally high temperatures recorded in November were followed by a great increase in the number of cases reported in December. Diphtheria and scarlet fever both attained their greatest prevalence in May, as far as can be judged by cases reported, and there appear to be no exceptional meteorological conditions to account for the fact.

*Topographical Distribution.*

9. As our returns of infectious diseases have only been classified for this year, the following particulars are recorded for future use, as no general deductions can be made from them, confirmatory or otherwise, as to the existence here of special areas affected by special diseases, such as the "diphtheria regions" in England. But during the year typhoid fever was in Tasmania, as in the rest of Australasia, an urban disease, while it is now the contrary in England. In the two districts of Hobart and Launceston, with about 30 per cent. of the population of the Colony, about 70 per cent. of the cases occurred. If the ratio of deaths to cases holds good for the whole island, the deaths in these two urban communities equalled 11 in 10,000 living to 5·83 in the whole Colony, as compared with 1·6 in London and 2·07 in all England. Of the 164 cases of diphtheria in the whole Colony 60 occurred in the two urban communities, a number not far from that of the proportion due to relative population. In scarlet fever the relative proportion of town and country cases in England was also reversed here; a result due most probably to the fact that the urban hospitals are not made much use of here, as though 249 of the whole 317 cases reported occurred in the two urban districts, only 18 of them were treated in the hospitals: in other words, it is probable that in only 18 out of the whole number of cases were proper precautions taken for preventing the dissemination of the germs of this most infectious disease.

*Use of Hospitals.*

10. Generally speaking, it appears to us that sufficient use is not made of the hospital accommodation wherever it exists for the treatment of infectious cases; and furthermore, that where it does not exist that every encouragement should be given to local efforts to provide it. In Hobart and Launceston our notice has been called to cases showing how the hospitals are not made use of when they ought to be, and are made use of when they ought not to be. In connection with one case and its sequel both these points are illustrated. A girl in service in Hobart was ill with fever, and after

some treatment was sent, not to the hospital, but home to her friends in the country, where she introduced the infection, and other cases occurred. Getting worse and worse she was taken in a moribund condition to the General Hospital, and shortly after died. The effect of such an occurrence is very harmful. The *morale* of the ward may be upset by the introduction of a hopeless case, and nervous patients who have been progressing favourably receive a dangerous shock. It is not fair to the institution and its medical and nursing staff, to say nothing of the other patients, to bring in a person to occupy, and hopelessly occupy, time and care and attention that are fully demanded by cases where life can be saved by them. It is not fair to the patient, who might have been saved by having been brought in time.

#### *Means of Disinfection.*

11. In connection with the prevalence of infectious diseases, we have taken care that all Local Boards should be kept supplied with the disinfectants most generally available for fumigating and purifying houses and their contents. We have not lost sight of the desirability of providing means for the proper disinfection of clothing and bedding, and shall be prepared to report thereupon to you for the information of Parliament during its Session.

#### *Quarantine Act.*

12. No occasion has arisen during the latter half of the year for action under the provisions of the Quarantine Act. On the occurrence of the case of smallpox at Launceston in August, the Central Boards of Health of the other Colonies were informed thereof, and of the precautionary measures taken to prevent the spread of the disease, and as these were held to be sufficient, no steps were taken to interfere with Tasmanian commerce in respect of all vessels leaving with a clean bill of health and found clean when medically inspected on arrival; and this was the case with all vessels.

#### *Amendment of the Public Health Acts.*

13. Our experience of the working of the Public Health Acts has suggested to us the necessity of amending certain sections, and the desirability of making provision for matters not dealt with. It was hoped that the principal of the necessary provisions would have been secured by the passing of the proposed Local Government Bill, but as that Bill did not get through all its stages in Parliament, the matters still need attention. We propose, therefore, to address you on the subject should the provisions of the Local Government Bill not become law during this Session of Parliament.

#### *Public Buildings.*

14. Our attention has been drawn to the comparatively few plans of public buildings, as defined by Section 114 of the Act of 1885, that are submitted either to us or to Local Boards of Health previous to building or to opening. Our Inspector, on his visits to various parts of the country, frequently has to call the attention of Local Boards to buildings in course of erection for which no plans have been sent to us as required by the above cited Section. As the safety of the public calls for attention to many points of construction, such as the means of egress, ventilation, and other matters, it is necessary to exact the fulfilment of the law. In connection with this matter, we are getting information as to the means of egress, of extinction of fire, of ventilation, and as to the sanitary arrangements of existing buildings.

#### *Noxious Trades.*

15. In connection with areas in which noxious trades might be carried on without injury to the public, we would suggest that an Act should be passed enabling the Government to define and proclaim such areas, and to make regulations for their use and occupation. This is particularly required in the neighbourhood of Launceston, where we have had repeatedly to refuse applications for the establishment of such trades near the town. As the Act should be an enabling one only, it need not be acted upon unless there was a consensus of opinion among manufacturers in favour of a proposed area.

#### *Inspector's Special Work.*

16. During the half-year the Inspector has made 23 official visits to various parts of the country, and has sent in 13 special reports, some of which have already been presented to Parliament.

#### *Central Boards of other Colonies.*

17. The usual interchange of information has taken place with the Central Boards of Health of the other Colonies. Very valuable reports on typhoid fever have been received from Sydney and Melbourne. During the occurrence of smallpox at Launceston daily bulletins were sent to all the Colonies until all danger of spread of infection was passed.

#### *LOCAL BOARDS.*

18. In the following summary of the proceedings of Local Boards it must be understood that in all cases reported of infectious diseases due precautions were taken to prevent the spread of the infection, though the measures adopted are not described.

*Beaconsfield.*

19. From Beaconsfield no further cases of typhoid were reported, so the number for the year is five. No cases of diphtheria were reported. Four cases of scarlet fever were notified in July, and three in December, making a total of seven for the year.

*Boobyalla.*

20. Boobyalla is in the happy condition of having no record for the year.

*Bothwell.*

21. No further returns were received from the Municipality of Bothwell, so the total record is the one case of typhoid fever referred to in our interim report.

*Brighton.*

22. From Brighton Municipality four more cases of typhoid fever, making seven for the year; seven more cases of diphtheria, making eight for the year; and six more cases of scarlet fever, making seven for the year, were reported. In connexion with the outbreak of diphtheria at Mr. A. Barwick's, postmaster and storekeeper at Ti-tree, where four cases occurred, two of which were fatal, a special inspection was made. The post office business was temporarily removed, and the store in the house closed, and its trade carried on in other premises. This outbreak, and the periodical outbreaks of disease in the Municipality, are all attributable to the bad quality of the water used in summer time.

*Brothers' Home.*

23. The Local Board of Health of Brothers' Home made By-laws for the better sanitary administration of its district, which have been duly certified by the Honourable the Attorney-General, confirmed by the Board, published in the *Gazette* of the 9th October, and laid on the table of each House of Parliament. Two more cases of typhoid fever were reported, making 12 cases for the year. Prompt measures were taken by the Local Board in connexion with cases which were apprehended to be of diphtheria, and all spread of infection prevented. A supply of disinfectants was sent.

*Burnie.*

24. The Health District of Burnie has a clean bill of health for the year so far as infectious diseases are concerned.

*Campbell Town.*

25. No further cases of typhoid fever were reported from Campbell Town, leaving the number of cases for the whole year at four. Three cases of diphtheria were reported, and no cases of scarlet fever.

*Carnarvon.*

26. No Local Board having been appointed for the Police District of Carnarvon, we have had to act as such under the provisions of the 6th Section of the Act of 1887. Some cases of virulent scarlet fever having occurred at Impression Bay, Dr. Smith was asked to see that all necessary precautions were taken to prevent spread of infection, and a supply of disinfectants was sent. In all, six cases of scarlet fever and two cases of typhoid were reported during the year.

*Clarence.*

27. From the Municipality of Clarence one more case of typhoid fever was reported, making three for the year. No further cases of diphtheria occurred, leaving the total at one case. Three cases of scarlet fever were reported.

*Deloraine.*

28. Six more cases of typhoid fever were reported from the Municipality of Deloraine, making nine cases for the year; one more case of diphtheria brought up the total to nine also; and five more cases of scarlet fever made six cases for the year.

*Ellesmere.*

29. No cases of infectious disease have been reported from the Town of Ellesmere.

*Evandale.*

30. From the Municipality of Evandale three cases of typhoid fever and two of diphtheria were reported for the year.

*Fingal.*

31. During the half-year the Inspector visited and reported upon the sanitary condition of all the townships in the Municipality of Fingal, and his report has been presented to Parliament. In consequence of his report upon the condition of the police station at Avoca, we took steps under the Acts to prevent the continued occupation of the constable's house as a human habitation, the legal formalities in connection with which are not yet fulfilled. Only one more case of typhoid fever was reported, making a total of six for the year. The total number of cases of diphtheria remains at six. No cases of scarlet fever were reported.

*Formby.*

32. The Town Board of Formby has framed By-laws that have been duly certified, sanctioned, gazetted, and laid on the table in both Houses of Parliament. Dr. Cookson has been appointed by the Board as its Officer of Health, and the appointment duly confirmed. The Inspector visited the town, and conferred with the Board in reference to the sanitary condition and water supply of the district. Two cases of typhoid fever, two of diphtheria, and one of scarlet fever were reported.

*Franklin.*

33. The Local Board of Franklin appointed Dr. Weaver, and subsequently, on his resignation, Dr. Elliott, as Officer of Health of its district, and the appointments were duly confirmed. Action was also taken by the Board in connection with nuisance caused by a slaughter-house, and the slaughter-house was removed. No cases of typhoid fever were reported. No more cases of diphtheria were reported, leaving one as the total for the year. Five more cases of scarlet fever brought up the total to 10.

*George Town.*

34. The Local Board of George Town framed By-laws, which have passed through all the stages necessary to validate them. In the case of a new assembly hall, the Local Board, in co-operation with us, authorised its being opened, when the safety of the public in case of panic had been duly secured by the provision of ample means of egress by doors opening outwards. No further cases of typhoid fever were reported, leaving the total for the year at two. No other infectious diseases were reported.

*Glamorgan.*

35. The Municipality of Glamorgan had a clean bill of health for the whole year.

*Glebe Town.*

36. No further cases of infectious disease were notified from Glebe Town, the totals for the year remaining at two cases of typhoid fever, one of diphtheritic sore throat, and three of scarlet fever.

*Glenorchy.*

37. From the Municipality of Glenorchy two more cases of typhoid fever and one more case of diphtheria were notified, making the total number of cases reported for the year four of typhoid fever, three of diphtheria, and two of scarlet fever. Special reports were received from the Local Board upon the condition of slaughter-houses in this district, and on the condition of the houses that have been built and continually are being built along the Main road without any means of drainage except the road ditches and table drains. We have instructed our Engineering Inspector to report on this matter.

*Gordon.*

38. From the Gordon District one more case of typhoid fever and five of scarlet fever were notified, making the total reports for the year three of typhoid fever, two of diphtheria, and five of scarlet fever.

*Gould's Country.*

39. The Local Board of Gould's Country has made By-laws, which have passed through all stages necessary for their validation. Our Inspector paid the district a visit, and conferred with the Local Board and its Inspector. At the end of the year, at the request of the Local Board, we asked you to call the attention of the Education Department to the want of proper sanitary arrangements at the public school at Blue Tier. Two cases of diphtheria were notified, but no cases of typhoid or scarlet fever.

*Green Ponds.*

40. No further cases of infectious disease were notified from the Municipality of Green Ponds, so that its health record would have been clear but for the imported case of typhoid fever mentioned in our interim Report.

*Hamilton.*

41. Two more cases of diphtheria were notified from the Municipality of Hamilton. Altogether, five cases of diphtheria and one of scarlet fever were reported for the year. A supply of disinfectants was sent.

*Hamilton-on-Forth and Don.*

42. One case of typhoid fever was notified from the Hamilton-on-Forth and Don District, being the only case of infectious disease reported.

*Hobart.*

43. During the latter half of the year the difficulties connected with the proper disposal of the night-soil of the City of Hobart continued. The contractors of the Local Board persisted in using the Crown land near the Gas Works as a washing-place for the moveable pails from the privies, and so great was the nuisance caused thereby that the Central Board gave the Local Board notice to discontinue the performance of washing there, and advised the Lands Department to cancel the lease of the land if the pails and their contents were dealt with at the place.

The result of our calling the attention of the Local Board to the complaints made by residents in the neighbourhood of St. David's Cemetery of the nuisance arising from the open ditch therein, which received the sewage from part of the City, has been that the nuisance is now remedied by the construction of a covered sewer.

The three months' notice given to the Local Board to do the necessary work for improving the sanitary condition of the block of buildings lying between Antill-street, Watchhouse-lane, Davey-street, and Macquarie-street having expired, we instructed the Engineering Inspector to make the necessary survey, and report upon the work to be done. The survey has been completed, and the accompanying plan sets forth the sewers and drains that we intend to have constructed under the provisions of the 16th Section of the Act of 1885.

During the last half of the year twenty more cases of typhoid fever were notified, making 149 for the year; eight more cases of diphtheria, making 18 for the year; and 30 more cases of scarlet fever, making 60 for the year. These numbers give 227 cases of infectious diseases for the year, or an average of 9·2 cases in every thousand of the estimated population. In our interim Report we gave a map of Hobart, divided into 21 districts, and a table shewing the distribution of these diseases throughout the City. From this table it appeared that the disease-rate for the year in various districts varied from 1·3 to the thousand in No. 13 (Barracks and St. George's Hill District) to 19·8 in No. 18 (District including the "Antill-street block.") Happily, the second half of the year was not marked with as much sickness as the first; but No. 13 remained the healthiest district, no fresh cases being notified, and consequently the rate continuing at 1·3 to the thousand; and No. 18 remained the most unhealthy, with a rate increased to 22 to the thousand, and all of them typhoid fever cases. For future reference and comparison we append the rates for all the districts:—

No. 1 District, 14·1 cases to the thousand of population.

2	"	8·3	"	"
3	"	12·6	"	"
4	"	9·9	"	"
5	"	13·3	"	"
6	"	5·8	"	"
7	"	6·8	"	"
8	"	8·0	"	"
9	"	9·1	"	"
10	"	12·6	"	"
11	"	9·5	"	"
12	"	5·4	"	"
13	"	1·3	"	"
14	"	7·4	"	"
15	"	2·6	"	"
16	"	8·2	"	"
17	"	10·8	"	"
18	"	22·0	"	"
19	"	16·5	"	"
20	"	5·5	"	"
21	"	8·6	"	"

#### *Invermay.*

44. The Central Board has continued to administer the Health District of Invermay under the provisions of the 6th Section of Act of 1887. Finding that notwithstanding the refusal of this Board to sanction the establishment of their soap and candle factory in Frank-street, Messrs. Upton continued the manufacture, we gave our Secretary instructions to take proceedings for the enforcement of the Act in case the work was carried on after reasonable time had been allowed to remove it elsewhere. It is in connexion with such cases as Messrs. Upton's that we make the recommendation contained in Section 15 of this Report. Complaints having been made of the nuisance arising from the soap and candle works of Messrs. Evans, in the same street, a report on the matter was made by the Engineering Inspector, and he was instructed to take the requisite steps for having the nuisance abated. He also sent in a special report upon the drainage of part of the district contiguous to Launceston. Four more cases of typhoid fever were notified, making the total number for the year nine cases. Only one case of diphtheria was notified, and no case of scarlet fever. A supply of disinfectants was sent.

#### *Kingston.*

45. The Local Board of Kingston has made By-laws, which have been duly confirmed, gazetted, and laid on the Table of each House of Parliament. Six cases of typhoid fever have been notified during the year.

#### *Latrobe.*

46. The By-laws of the Local Board of Latrobe have been duly confirmed and passed through all stages necessary to validate them. The Engineering Inspector has visited the district, and made a special report on the drainage of the township. No further cases of infectious disease have been notified, and the total remains at three cases of typhoid fever for the year.



*Launceston.*

47. At the end of August the Local Board of Launceston notified the occurrence of a case of smallpox, the patient being Frederick Pearson, aged 9, living in a house in Elizabeth-street. Proper precautions were at once taken to isolate the case and those who had been in contact with it, and the necessary Order to give effect thereto was made by the Governor in Council, under the provisions of the 14th Section of the Act of 1887. Arrangements were also made with Dr. Elliott to isolate himself from his other patients and exclusively take charge of the case. In consequence of the interference of another medical practitioner the family of the patient refused to be re-vaccinated or to remove into another house provided for them. Another of the family accordingly caught the disease, and the period of isolation of all had to be extended until the complete convalescence of the second case. Fortunately the cases were mild ones—the patients having been vaccinated when young—and no further cases followed. They were in all probability caused by infection resulting from the 1887 outbreak, as Pearson's family for a short time occupied a house that had been inhabited by persons who had suffered in that outbreak. Though the house had been cleansed and fumigated after the occupancy and death of one of these persons, it seems likely that some infected object had been overlooked and had come into the possession of young Pearson or one of the other children.

At the instance of the Local Board, a question as to the interpretation of the 113th Section of the Act of 1885 was submitted to the Law Officers of the Crown, and their advice obtained.

As usual, there have been received from the Local Board copies of the very exhaustive reports of its Sanitary Officer on the local administration of the Health Acts.

Unhappily, the whole year has been marked by the prevalence of infectious disease—53 more cases of typhoid fever, seven more of diphtheria, and 52 more of scarlet fever having been notified during the latter half of the year. These numbers give, for the whole year, 190 cases of typhoid fever, 31 of diphtheria, and 144 of scarlet fever, making a total of 365 cases of these diseases, being at the rate of 23·5 in the thousand. It would not be fair to institute a comparison between the two chief cities of the Colony based on the number of notified cases of infectious disease, as every indication exists that all such cases are notified at Launceston, while nothing like all are notified in Hobart. But, taken by themselves, the numbers are such as to suggest a very careful enquiry into the causes that produce so large a crop of cases. This inquiry is the more necessary as the city is, to a certain point, well drained, but to a certain point only, and the defects of the older drains that have yet to be remedied are calculated to bring the whole drainage system into discredit. The Local Board is paying attention to the subject of ventilation of drains, paving of yards, and such like matters that are necessary complements of good sewerage.

*Lefroy.*

48. The Local Board of Lefroy has made By-laws, which have been confirmed and duly validated. An outbreak of diphtheria, accompanied with many cases of sore throat, occurred in August. The public school was closed, and a medical inspection of the locality affected was asked for. Dr. Thompson, of the General Hospital, Launceston, was good enough to undertake this duty, and at his suggestion samples of the water used by the patients' families were obtained and analysed by Mr. Ward, and found quite unfit for human consumption. A supply of disinfectants was sent. The infectious diseases notified for the year were the three cases of diphtheria above alluded to though probably other cases occurred.

*Leven.*

49. In consequence of Ulverstone being proclaimed a town under the Town Boards Act, the outlying parts of the Health District that had been called after the name of the town had to be re-proclaimed a Health District under the name of Leven, and a new Local Board appointed. This was accordingly done, and the new Board gazetted on the 23rd October. No cases of infectious disease were notified from the district.

*Longford.*

50. Eight more cases of typhoid fever were notified from the Municipality of Longford, making eleven for the year. Three cases of diphtheria were also notified, but no cases of scarlet fever.

*New Norfolk.*

51. The Report of the Engineering Inspector on the drainage of the older portions of the Hospital for the Insane at New Norfolk has been forwarded to you and laid upon the table of each House of Parliament. Two more cases of typhoid fever were notified from the Municipality, making ten for the year. No diphtheria was reported, but there were two cases of scarlet fever.

*New Town.*

52. The Local Board of the District of New Town called our attention to the condition of the sanitary arrangements at the public schools, and the Education Department has had a complete re-construction of them made. No further cases of typhoid fever or of diphtheria were notified, but there were nine more cases of scarlet fever, making the totals for the year eight cases of typhoid fever, one case of diphtheria, and seventeen of scarlet fever.

*Oatlands.*

53. Two more cases of diphtheria were reported from the Municipality of Oatlands, making three cases for the year.

*Penguin.*

54. The Local Board of the District of Penguin has made By-laws, which have been duly confirmed and validated. One case of scarlet fever was notified during the year.

*Port Cygnet.*

55. The Local Board of the Health District of Port Cygnet reported the occurrence of a case of typhoid fever in a locality far removed from medical assistance, and requested help. You authorised us to send Dr. Oldmeadow from Hobart, who reported to us upon the case, which unfortunately proved fatal. In all, three cases of typhoid fever occurred during the year. In August four cases of diphtheria occurred in one family, and the Local Board made the necessary arrangements for sending the patients to the General Hospital, Hobart, but the father refused to allow them to be sent. A few days after he himself took two of the children to the Hospital, going with them on board the steamer which plies between the port and Hobart. As he did not notify to the captain the condition of his children, the Local Board was recommended to prosecute under 16th section of the Act of 1887. The steamer was thoroughly fumigated. The total number of cases of diphtheria notified for the year was five. Five cases of scarlet fever were reported, as mentioned in our interim Report.

*Queenborough.*

56. No further cases of typhoid fever were reported from the Local Board of Queenborough, leaving the total for the year at 15. One more case of diphtheria was notified, making two for the year, and one more case of scarlet fever raised the total to six.

*Richmond.*

57. Two more cases of typhoid fever were notified from the Municipality of Richmond, making the total for the year six. Two cases of diphtheria occurred in the family of the master of the public school at Tea Tree, and the school was closed for a period. No cases of scarlet fever were notified.

*Ringarooma.*

58. The Local Board of Health of Ringarooma and the boundaries of its district were duly gazetted on the 25th September. One case of diphtheria has been notified during the year.

*Ross.*

59. No more cases of infectious diseases were notified from the Municipality of Ross; the total for the year being three cases of typhoid fever.

*Russell.*

60. As there is no Local Board yet appointed in the Police District of Russell, the Central Board has the power of a Local Board therein. During the year one case of diphtheria and one case of scarlet fever were notified.

*St. Helen's.*

61. No further cases of infectious diseases were notified from St. Helen's, leaving one case of typhoid fever as the total for the year. The Engineering Inspector paid the district a visit, and went round the town with the Inspector of the Local Board. A question relative to its powers under the 124th section of the Act of 1885, and 18th of the Act of 1887, in respect of enforcing the provision of properly constructed earth-closets was raised by the Local Board in connection with one of its by-laws, which enacts that every house shall have such a closet. It was held by the Law Officers of the Crown that such a by-law could not be enforced in regard to houses with sufficient privy accommodation of other description until the Local Board had established, under its own direction, "a proper system for emptying and cleansing" earth-closets.

*St. Leonard's.*

62. In consequence of difficulties experienced in organising Local Boards in the districts of South Selby and Patersonia, the Local Board of St. Leonard's has had to administer the Acts in a wide extent of territory. One more case of typhoid fever was notified, making a total of seven for the year. Three more cases of diphtheria were reported, making four for the year. In connection with these cases an incident happened that shows the necessity for enforcing the registration of all dairies. The by-laws of the Local Board contain full provisions for the taking of the necessary precautions for preventing the spread of infection by means of milk in case any disease occurred in a registered dairy. Diphtheria broke out in a dairy in the St. Leonard's District, but which supplied Launceston with milk, and which had not been registered, as the owner had paid fees in that city. The by-laws were, therefore, inoperative, and had the owner proved obstinate an order would have had to be obtained from the Governor in Council for isolating the premises. Scarlet fever broke out in the latter part of the year, 17 cases being notified, five of which were in one family in St. Leonard's, upon which Dr. McDonald reported. Ten cases occurred in Patersonia, and the Engineering Inspector visited the locality—the public school of which had been temporarily closed—and had the proper precautions taken. A supply of disinfectants was sent.

*Scottsdale.*

63. The existence of a Town Board at Ellesmere in the district that had been occupied by the Scottsdale Board necessitated the re-establishment of the latter, which was accordingly done by proclamation in the *Gazette* of the 30th December. The Engineering Inspector paid the district a visit. Three more cases of typhoid fever in connexion with the railway works were notified, making seven for the year.

*Sheffield.*

64. The Local Board of Health of Sheffield appointed R. H. D. Davis, Esq., M.R.C.S., to be the Officer of Health of its district, and the appointment was confirmed. At the desire of the Local Board the condition of the public school with respect to overcrowding and water supply was brought under the notice of the Honourable the Minister of Education, and the necessary remedial work has been undertaken. One case of typhoid fever and six cases of diphtheria have been notified during the year. In connexion with the latter, the Engineering Inspector paid a visit to the locality, and examined the Redwater Rivulet, from which the water supply of the neighbourhood was taken. On analysis the condition of this water was found to be bad enough to account for the prevalence of disease.

*Sorell.*

65. No more cases of typhoid fever were reported from the Municipality of Sorell, leaving five cases as the total of the year. Two cases of diphtheria and eight cases of scarlet fever were notified, all in the latter half of the year. A satisfactory report on the dairies of the district was received from the Local Inspector.

*Spring Bay.*

66. No further cases of infectious disease were notified from the Municipality of Spring Bay, leaving the four cases of diphtheria reported from Maria Island as the total for the year. A supply of disinfectants was sent.

*Straits' Islands.*

67. We have received two satisfactory reports from the Sub-Inspector we appointed for Cape Barren Island and the adjoining islands as to the sanitary condition of the inhabitants.

*Torquay and Formby.*

68. It will be necessary, should the Local Government Bill not become law, to re-organize the Local Board for the District of Torquay and Formby, as Formby is now a town under the Town Boards Act. The Engineering Inspector has paid a visit to the district. No further cases of infectious disease have been reported, leaving the total for the year one case of typhoid and one of scarlet fever.

*Trevallyn.*

69. One more case of typhoid fever was notified from the Town of Trevallyn, making two cases for the year.

*Ulverstone.*

70. The Local Board of the Town of Ulverstone appointed Dr. McCall to be its Officer of Health, and the appointment was confirmed. Nine cases of typhoid fever have been notified during the year; and in connexion with one of them an application was received from the Board for our consent to the closing of a well in Badger-street, the water of which was certified by the Officer of Health to be unfit for human consumption. The consent was given, and the well closed accordingly. In consequence of some matters affecting its status as Town Board, the Local Board has resigned.

*Upper Piper.*

71. The Local Board of the District of Upper Piper has made By-laws, which have been confirmed and duly validated. The district has been unhealthy during the year, 25 cases of typhoid fever and 12 of diphtheria being notified.

*Waratah.*

72. Four cases of typhoid fever were reported from Waratah, and in connexion with some of them the Local Board was authorised to employ Dr. Kennedy, and a supply of disinfectants was sent.

*Weldborough.*

73. The Local Board of Weldborough made By-laws, which have been confirmed and duly validated. The Engineering Inspector paid the district a visit, and with the Board and its officers examined the town, more particularly with reference to the Chinese quarters, and his report thereupon has been presented to Parliament. The one case of scarlet fever mentioned in our interim Report was the only of infectious disease reported during the year.

*Westbury.*

74. Seven more cases of typhoid fever and three of scarlet fever were notified from the Municipality of Westbury, making the infectious disease record for the year eight cases of typhoid, seven of diphtheria, and three of scarlet fever. A supply of disinfectants was sent.

*West Tamar.*

75. Seven more cases of diphtheria were reported from the District of West Tamar, six of them occurring in one family. Dr. Pike was good enough to send us a report of the examination he had made of the premises occupied by the family, where he found no insanitary conditions likely to cause the outbreak. He suggested that in all probability the infection was imported from another district, where some of the family had been visiting at a house in which the disease had occurred. In this particular the Local Inspector's report confirmed the fact of communication with the infected house.

*Wynyard.*

76. No more cases of infectious disease were reported from Wynyard, the return for the year being the one case of diphtheria noticed in our interim Report.

*By-laws.*

77. In connexion with the precautions to be taken to prevent the spread of infection, and with many other matters relating to the sanitary administration of a town or district, much facility is afforded by the provisions of such By-laws as are suggested in the Instructions issued to Local Boards. Of the fifty-eight Boards above mentioned, only twenty-two have as yet passed such By-laws. We strongly recommend to all others to follow the example. The powers they will thus acquire need not be exercised until necessity arises. But in many places necessity is continually arising in cases that are difficult to deal with, because these powers have not been acquired.

## CHINESE IMMIGRATION ACT, 1887, 51 VICT. No. 9.

*Chinese.*

78. During the year 40 Chinese have arrived in the Colony, of whom 18 were naturalized British subjects, 9 of them having been naturalized in Tasmania, 8 in Victoria, and 1 in South Australia. Of the 40, there were landed, at Launceston 36, in Hobart 3, and at Formby 1. Under the provisions of the Act, 16 were vaccinated before being allowed to land.

## VACCINATION ACT, 1882, 46 VICT. No. 19.

*Administration.*

79. As mentioned in our interim Report, the Board undertook the administration of the Vaccination Act, and began the work in April. By this arrangement the birth returns of the children born in the latter half of 1887 came under our consideration. We have already given you information with respect to the third quarter of the year, and now complete it for the whole half-year.

*Half-year ending 31st December, 1887.*

80. Returns were made of the births of 2334 children for the half-year ending 31st December, 1887, of whom probably 267 are dead and 80 have left the country or cannot be found, leaving 1987 to be accounted for. Of these, about 100, or 5 per cent., may have been vaccinated as private patients by medical practitioners. As regards vaccinations by public vaccinators, we have before pointed out that it is quite impossible to make correct returns on account of the neglect of some parents to bring again their children on the eighth day after the operation for the purpose of inspection, and of the custom of many others to bring their children for vaccination—not on the day appointed for the purpose—but on the day appointed for the inspection of the children vaccinated the week before. In this latter case as the vaccinator cannot pay a third visit, the results can only be guessed at until the next vaccination tour in the district. The whole of the vaccinators do not send in returns of these cases nor of unsuccessful vaccinations, so in the following statement the proportion of them in the accounts in which they are given has been taken to represent the proportion in the whole. With these explanations the following is the account of the 1987 remaining children who were born in the latter half of 1887:—

Probably vaccinated as private patients .....	100	
Successfully vaccinated by public vaccinators.....	772	
Probable number of same not verified .....	72	
Probable total vaccinated .....		944
Vaccinations postponed by certificate .....		160
Declared unsusceptible by certificate .....		9
Probable number unsuccessfully vaccinated .....		62
Children still unvaccinated whose parents have been fined .....		198
Cases adjourned to allow time for vaccination.....		33
Leaving unaccounted for .....		581
		<hr/> 1987

The greater part of the 581 unaccounted for are in the Hobart District. The above figures show that 47 per cent. of the children have been vaccinated—42 per cent. by public, and 5 per cent. by

private vaccinators, and that nearly 59 per cent. have been presented for vaccination. If Hobart had done as well as the rest of the country these rates would have been very different, and as all the children referred to are now at least 18 months old, the figures are not creditable to the metropolis of the Colony.

*Year 1888.*

81. For the year 1888 the greater part of the returns received by the Board from the Deputy Registrars do not precisely agree with those published by the Registrar-General in the Statistics of the Colony; but in the following table his figures are taken as far as possible. The returns of deaths of the children born in 1888 are necessarily incomplete, and therefore the numbers herein given are estimates only. In regard to vaccinations and police proceedings, the returns for the last quarter of the year are not yet due, so the table may be taken, in respect of those particulars, to show the result of three-quarters of a year's working of the Act. The number of children whose parents have left the districts in which the births were registered and who cannot be found is, in regard to districts where police action has not taken place, based on the average of the police returns of other districts.

*TABLE showing up to date the administration of the Vaccination Act with respect to Children born in Tasmania during the Year 1888.*

1. REGISTRATION DISTRICTS.	2. Births.	3. Deaths.	4. Parents left.	5. Vaccinated.	6. Postponed.	7. Insusceptible.	8. Cases adjourned.	9. Parents fined.	10. Percentage of remaining Children vaccinated, &c.	11. Percentage of remaining Children not accounted for.
Hobart (Urban) .....	814	81	80	30	1	1	0	0	4·9	95·1
Ditto (extra-Urban) .....	245	24	27	22	0	0	44	2	11·3	65·0
Launceston .....	748	74	94	151	27	3	79	73	31·2	42·6
Beaconsfield .....	96	9	5	10	1	0	0	0	13·4	86·6
Bothwell .....	52	5	2	0	0	0	0	0	0·0	100·0
Brighton .....	58	6	3	2	0	0	0	0	4·1	95·9
Campbell Town .....	82	8	4	21	10	0	2	16	44·3	30·0
Clarence .....	29	3	1	2	0	0	0	0	8·0	92·0
Deloraine .....	164	16	8	53	0	1	0	0	38·6	61·4
Emu Bay .....	117	11	6	45	5	0	0	0	50·0	50·0
Esperance .....	70	7	3	28	4	0	0	8	53·3	33·3
Evandale .....	90	8	4	7	45	0	1	0	66·7	32·0
Fingal .....	111	11	5	63	4	0	0	5	70·5	24·2
Franklin .....	70	6	3	10	1	0	2	10	18·0	62·5
Frankford .....	19	2	1	10	1	0	0	0	68·7	31·3
Geeveston .....	30	3	1	6	1	0	0	9	27·0	38·5
George Town .....	28	3	1	7	0	0	0	0	29·2	70·8
Glamorgan .....	49	4	2	2	0	0	0	0	4·7	95·3
Gordon .....	36	3	2	17	0	0	4	0	54·8	32·3
Green Ponds .....	42	4	2	4	3	0	0	0	19·4	80·6
Hamilton .....	66	6	3	0	0	0	0	0	0·0	100·0
Horton .....	67	6	3	41	10	0	0	0	88·0	12·0
Kingston .....	41	4	2	3	1	0	11	0	11·4	57·2
Lefroy .....	36	3	2	23	0	0	0	0	74·2	25·8
Longford .....	168	16	9	38	50	0	14	4	60·7	26·9
Mersey .....	248	24	10	69	7	1	42	38	36·0	31·3
New Norfolk .....	141	14	6	0	0	0	0	0	0·0	100·0
Oatlands .....	133	13	5	31	0	0	0	0	27·0	73·0
Port Cygnet .....	38	4	2	5	0	0	0	0	15·6	84·4
Portland .....	60	6	3	12	4	0	11	0	31·4	47·1
Port Sorell .....	9	1	0	0	0	0	4	1	0·0	37·5
Ralph's Bay .....	3	0	0	0	0	0	0	0	0·0	100·0
Richmond .....	75	7	4	3	0	0	0	0	4·7	95·3
Ringarooma .....	162	16	7	45	9	0	0	4	38·8	58·2
Sheffield .....	73	7	4	13	3	0	16	1	25·8	46·8
Sorell .....	72	7	4	8	1	0	0	0	14·7	85·3
Spring Bay .....	38	4	2	12	0	0	0	0	37·5	62·5
Strahan .....	3	0	0	0	0	0	0	0	0·0	100·0
Tasman's Peninsula .....	19	2	1	5	0	0	0	0	31·6	68·4
Ulverstone .....	177	17	8	73	2	1	4	8	50·0	42·1
Victoria .....	31	3	1	4	0	0	0	0	14·8	85·2
Waratah .....	76	7	4	25	2	0	0	0	41·5	58·5
Westbury .....	142	14	7	32	1	0	0	0	27·3	72·7
TOTAL .....	4777	469	341	932	193	7	234	179	28·5	61·3

Taking into account the necessary incompleteness of the returns as explained above, and the facts we have stated in paragraph 81 as to the difficulty vaccinators experience in verifying their work, the figures in the above table make it probable that over one-third of the children born in 1888 and remaining alive and in Tasmania have been already vaccinated, and that nearly one-half have been vaccinated, or the vaccination postponed by medical certificate.

82. This result is very unsatisfactory. It is especially so when attention is paid to the great difference that exists in the returns from various parts of the country. An examination of these returns will show that it depends almost entirely upon the interest that medical men take in the matter whether or not the children in a district are vaccinated. The enforcement of the law in regard to vaccination has but little influence in comparison with that of the doctor. An illustration of this is afforded by the returns relative to two districts which follow each other in the foregoing table. They are both large districts, thinly inhabited, each having a resident doctor, and each evidently having about an equal population, as the numbers of births in them for the year were respectively 66 and 67—giving 57 and 58 respectively as the probable numbers remaining still in them. Of the 57, not one was vaccinated or had its vaccination postponed, nor was any action taken in regard to vaccination: consequently, in the column for the percentage of children brought to the vaccinator the entry is 0; and in the column for the percentage of children “not accounted for” the entry is 100 per cent. On the other hand, of the 58 in the next district 41 have been successfully vaccinated, and 10 have had postponement certificates, making 88 per cent. who have been to the vaccinator—and that is, when it is remembered that the last quarter’s return is incomplete as above explained, as large a percentage as can probably be obtained anywhere. And this result has been gained without any actual prosecutions, the police action having been limited to actively aiding the public vaccinator and the parents by getting and giving all possible information as to the children to be vaccinated on the one hand, and, on the other, of the time and place where they could be vaccinated. Again, the relative returns from the north and south of the island shew great discrepancies. The returns from Hobart shew how little the resident medical practitioners care for the vaccination of children, and this indifference characterises the South generally. In the South, of 1738 “remaining” children of those born in 1888, there were taken to doctors for vaccination or certificate, only 207, or 11·9 per cent. In the North, of 2229 “remaining” children, 925, or 41·5 per cent., were so taken. The percentage of children “not accounted for” in the South was 82·9, as compared with 44 in the North. Speaking generally, very few of the returns are what they should be, and what they might be with more assistance from the medical profession.

83. The returns of the Public Vaccinators show that during the year 2329 children were successfully vaccinated, and 479 more were vaccinated, but the success of the operation could not be certified, as the children were not brought back on the eighth day. Probably not more than 250 more vaccinations were performed by other medical practitioners. If this be so, the population is getting to be less and less protected by vaccination, as it is increasing by births at the rate of at least 1000 a year more than the total number of vaccinations for the year. Of the 2329 known successful vaccinations by Public Vaccinators, 962 were of children under one year of age, 1355 of children and young persons from one to fifteen years of age, and 12 of adults. Dr. Davis, the Public Vaccinator for the North, performed 606 of the successful vaccinations, and 210 of those not verified on the eighth day, making a total of 816 vaccinations; and Dr. Willes, the Public Vaccinator for the South, 660 successful and 237 unverified vaccinations, making a total of 897. The cost to the department of these 1713 vaccinations was £787 2s. 9d., or about 9s. 2½d. each—which is not an extravagant rate when it is considered that the operations were all performed in thinly-peopled districts, and not in the towns, and each of them involved two journeys at least—sometimes to considerable distances—and that the longest journeys often give the smallest results, as they are made to outlying districts with a small and scattered population.

84. We regret that our experiment to cultivate calf lymph for the requirements of the Colony has not succeeded, as the necessary supervision of the animals could not be secured. We have therefore discontinued it, and procure our supply from New Zealand; and the quality of the lymph we have thence received has given general satisfaction.

85. We beg to call your attention to the Appendices to this Report, which contain matters of general interest to the community, especially to those occupied with its sanitary condition.

We have the honour to be,

Sir,

Your obedient Servants,

P. O. FYSH, *President.*

WM. BELBIN.

WM. BENSON.

CHARLES HARBOTTLE.

J. WEMYSS SYME.

*Hobart, 20th August, 1889.*

A. MAULT, *Secretary.*

## APPENDIX A.

*GENERAL Memorandum on the Proceedings which are advisable in Places attacked or threatened by Epidemic Disease.*

THE Secretary of State for the Colonies has forwarded to His Excellency the Governor, for the information of the medical authorities of the Colony, a copy of the above Memorandum by Dr. Buchanan, Medical Officer to the Local Government Board. The following extracts are given for the use of Local Boards of Health:—

1. Wherever there is prevalence or threatening of cholera, diphtheria, fever, or any other epidemic disease, it is of more than common importance that the statutory powers conferred upon Sanitary Authorities for the protection of the public health should be well exercised by those Authorities, acting with the advice of their Medical Officers of Health.

2. Proper precautions are equally requisite for all classes of society. But it is chiefly with regard to the poorer population, therefore chiefly in the courts and alleys of towns, and at the labourers' cottages of country districts, that local authorities are called upon to exercise vigilance, and to proffer information and advice. Common lodging-houses, and houses which are sub-let in several small holdings, always require particular attention.

3. Wherever there is accumulation, stink, or soakage of house refuse, or of other decaying animal or vegetable matter, the nuisance should as promptly as possible be abated, and precaution should be taken not to let it recur. Especially examination should be made as to the efficient working of sewers and drains, and any defect therein, and any nuisance therefrom or from any foul ditches or ponds should be got rid of without delay. The ventilation of sewers, the ventilation and trapping of house-drains, and the disconnection of cistern overflows and sink pipes from drains should be carefully seen to. The scavenging of the district, and the state of receptacles for excrement and of dust-bins, will require close attention. In slaughter-houses, and wherever animals are kept, strict cleanliness should be enforced.

4. In the removal of filth during periods of epidemic disease, it is commonly necessary to employ chemical agents for reducing or removing the offence and harm which may be involved in the disturbance of the filth. In the removal of privy contents these agents are more particularly wanted if the disease in question be cholera or enteric fever. The chemical agent should be used liberally over all exposed surfaces from which filth has been removed. Unpaved earth close to dwellings, if it be sodden with slops or filth, ought to be treated in the same way.

5. Sources of water-supply should be well examined. Water from sources which can be in any way tainted by animal or vegetable refuse, especially those into which there may be any leakage or filtration from sewers, drains, cesspools, or foul ditches, ought no longer to be drunk. Above all, where the disease is cholera, diarrhoea, or enteric fever, it is essential that no impure water be drunk.

If, unfortunately, the only water which for a time can be got should be open to suspicion of dangerous organic impurity, it ought at least to be boiled before it is used for drinking, but then not to be drunk later than 24 hours after it has been boiled. Filtering of the ordinary kind cannot by itself be trusted to purify water. It cannot be too distinctly understood that dangerous qualities of water are not obviated by the addition of wine or spirits.

6. When there appears any probable relation between the distribution of disease and of milk supplies, the cleanliness of dairies, the purity of the water used in them, the health of the persons employed about them, and the health of the cows that furnish milk should always be carefully investigated. Even apart from any apprehension of milk being concerned in a particular outbreak of disease, it is desirable that English people should adopt the custom, which is always followed in some continental countries, of boiling all milk at once upon its reception into a house.

7. The washing and lime-whiting of uncleanly premises, especially of such as are densely occupied, should be pressed with all practicable despatch.

8. Overcrowding should be prevented. Especially where disease has begun, the sick-room should, as far as possible, be free from persons who are not of use to the patient.

Ample ventilation should be enforced. It should be seen that windows are made to open, and that they are sufficiently opened. Especially where any kind of infective fever has begun, it is essential, both for patients and for persons who are about them, that the sick-room and the sick-house be constantly traversed by streams of fresh air.

9. The cleanliest domestic habits should be enjoined. Refuse matters should be speedily removed or destroyed; and things which have to be disinfected or cleansed should always be disinfected or cleansed without delay.

10. Special precautions of cleanliness and disinfection are necessary with regard to infective matters discharged from the bodies of the sick. Among discharges which it is proper to treat as infective are those which come in cases of small-pox and scarlatina from the affected skin; in cases of cholera and enteric fever from the intestinal canal; in cases of diphtheria and scarlatina from the nose and throat; likewise, in cases of any eruptive or other epidemic fever, the general exhalations of the sick. The caution which is necessary with regard to such matters must, of course, extend to whatever is imbued with them; so that bedding, clothing, towels, handkerchiefs, and other articles which have been in use by the sick may not become sources of mischief, either in the house to which they belong or in houses to which they are conveyed. So far as articles of this class can be replaced by rags or things of small value, it is best to use such things and burn them when they are soiled. Otherwise clothing and infected articles should be subjected to the disinfectant of the sick room or be removed for disinfection by heat.

In enteric fever and cholera the evacuations should be regarded as capable of communicating an infectious quality to any nightsoil with which they are mingled in privies, drains, or cesspools; and after such disinfection of them as is practicable, they should be disposed of without delay and under the safest conditions that local circumstances permit. They should not be thrown into any fixed privy receptacle, and above all, they must never be cast where they can run or soak into sources of drinking water.

11. All reasonable care should be taken not to allow infective disease to spread by the unnecessary association of sick with healthy persons. This care is requisite, not only with regard to the sick house, but likewise with regard to schools and other establishments wherein members of many different households are accustomed to meet.

12. If disease begins in houses where the sick person cannot be properly accommodated and tended, medical advice should be taken as to the propriety of removing him to an infirmary or hospital. Every Sanitary Authority should have in readiness a hospital for the reception of such cases.

Where dangerous conditions of residence cannot be promptly remedied, it will be best that the inmates, while unattacked by disease, remove to some safer lodging.

13. Privation, as predisposing to disease, may require special measures of relief.

14. In certain cases special medical arrangements are necessary. For instance, as cases of cholera in this country often begin somewhat gradually in the comparatively tractable form of what is called "premonitory diarrhoea," it is essential that, where cholera has appeared, arrangements should be made for affording medical relief without delay to persons attacked, even slightly, with looseness of bowels. So, again, where smallpox is the prevailing disease, it is essential that all unvaccinated persons (unless they previously have had smallpox) should very promptly be vaccinated; and that re-vaccination should be performed in cases properly requiring it.

16. The present memorandum relates to occasions of emergency. Therefore the measures suggested in it are essentially of an extemporaneous kind; and permanent provisions for securing the public health have, in express terms, been but little insisted on. It is to be remembered, however, that in proportion as a district is habitually well cared for by its Sanitary Authority, the more formidable emergencies of epidemic disease are not likely to arise in it.

17. Provision by the public authority for disinfection by heat of bulky articles, and of those which cannot without injury be exposed to chemical agencies, ought always to be in readiness. Without such provision no complete disinfection can be effected. Partial and nominal disinfection, besides being wasteful, may be mischievous, as giving rise to a false security.

18. The following system of domestic disinfection may be commended to Sanitary Authorities who have already provided adequate public means for the disinfection and for the disposal of infected matters and things:—

(a.) For the purposes of the sick room, such as the reception of soiled handkerchiefs, sheets, and the like, as well as for the swabbing of floors, a valuable disinfecting solution may be made with perchloride of mercury. It is well to have this solution slightly acid, coloured also in such a way that it shall not readily be confused with drinks or medicines; and proper caution should be given to avoid accidents in its use. Sanitary Authorities will find it advantageous to have such a solution\* prepared under the direct instructions of the Medical Officer of Health, and supplied of a uniform strength at the infected house upon the order of that officer.

(b.) In places provided with proper systems of excrement disposal, excrements of cholera and enteric fever, after being treated in detail with the same disinfecting solution in ample quantity, may be safely put into the ordinary closet; but special care as to the flushing of drains and sewers, and special frequency in the removal and exchange of excrement receptacles, will commonly be wanted. Where the only closet is one that communicates with a cesspool or privy pit, the best arrangement for the disposal of infected stools that under these improper local circumstances may be found practicable will have to be adopted.

(c.) A substance generally available in the removal of filth from privies and ashpits, and for application to foul earth and the like,† is sulphate of iron (green copperas), either in a strong solution made by stirring crystals of the salt with five or ten times their bulk of hot water, or in the form of powder, to which form the crystals may be readily brought after dessication. This agent should be used in quantity sufficient to destroy all odour, and in the removal of filth accumulations it should be well mixed with successive layers of the matter to be removed. The dry form of application is to be preferred where masses of wet or semi-solid filth have to be dealt with.

(d.) For disinfection of the air of rooms, after the room has been prepared by the removal of persons and of such articles as are best disinfected by heat, and by the closure of windows and crevices, sulphurous acid gas in ample quantity may be evolved, the doors being kept closed for six hours or more. The amount of sulphurous acid required for the disinfection of a moderate sized room can be obtained by burning  $1\frac{1}{2}$  lbs. of sulphur (roll brimstone) in a pipkin over a small fire placed in the middle of a room, with an old tray or the like to protect the flooring. These processes should be effected by skilled persons acting under the directions of the Medical Officer of Health.

(e.) After measures of disinfecting a room have been taken, all wall paper should be stripped from the walls and be burned, and the room ought to have its ceilings and walls thoroughly washed or lime whited.

GEORGE BUCHANAN, *Medical Officer.*

*Local Government Board, Medical Department,  
April, 1888.*

\* A solution fitted for the desired purposes may be made with  $\frac{1}{2}$  oz. corrosive sublimate, 1 fluid oz. hydrochloric acid, and five grains of commercial aniline blue, in three gallons (a bucketful) of common water. It ought not to cost more than 3d. the bucketful, and should not be further diluted. The use of non-metallic vessels (wooden or earthenware house tubs or buckets) should be enjoined on those who receive it, and articles that have been soaked in it should be set to soak in common water for some hours before they go to the wash.

† The removal of dangerous filth is here the object to be attained. It cannot confidently be stated that either the iron salt or any available substance will effect a true disinfection of such masses of filth as are here in question.



## APPENDIX B.

## SMALLPOX AND VACCINATION.

No one denies the fact that the death-rate from smallpox is much lower in vaccinated countries than it used to be. But some people maintain that this diminished death-rate is due to improved general sanitary conditions and not to vaccination. Recent occurrences at Sheffield have given an opportunity of decisively testing what is the real cause of the diminution.

At Sheffield, as elsewhere in England, the more vigorous adoption of sanitary measures and of vaccination were coincident, and took place about the year 1870. The opportunity is therefore given of knowing what has been the effect of the work done in a community of over 300,000 people; that is, one large enough to yield results that may be depended upon as fairly representative of actual facts everywhere. The comparison of the death-rates from what may be called preventible diseases for the ten years before 1870 and the ten years after shews that in the latter period these deaths have fallen, in the case of measles, 22 per cent., scarlatina, 27 per cent., whooping-cough, 7 per cent., diarrhœa, 28 per cent., diphtheria, 61 per cent., typhoid, &c. fever, 66 per cent., and smallpox, 72 per cent. If general sanitary work were the cause of this improvement, it is evident that the cause would act in corresponding manner, more or less close, in relation to people of all ages. It did so in the case of every disease but one. The 22 per cent. diminution in the death-rate of persons of all ages from measles is the result of a reduction of 22 per cent. in the death-rate of children under 10 years of age, and of 40 per cent. in the death-rate of older people, the latter being so few in number as not to affect the percentage. In like manner, the scarlatina 27 per cent., is the reduction of 27·5 per cent. of children, and 25 per cent. older people; the diphtheria 61 per cent., is the reduction of 67 per cent. children and 50 per cent. older people; the fever 66 per cent., is the reduction of 74·5 per cent. children and 61 per cent. older persons. A 23 per cent. reduction in the deaths of older people from diarrhœa relates to so few as not to affect the total percentage; and whooping-cough was fatal only to children. So in every one of these diseases in which deaths occurred in both children and adults there was a diminution in the death-rate in each class of age.

But in regard to smallpox it was quite otherwise. The diminution of 72 per cent. in the death-rate of persons of all ages is the result of the reduction of a diminution of 90 per cent. below the large death-rate of children before 1870, and of an *increase* of 34 per cent. above the small death-rate of older people before that year. It is therefore evident that some influence was at work in relation to smallpox other than that which affected the lessened death-rate in other preventible diseases, an influence that beneficially affected children, that is the age class that up to 1870 had been the most subject to smallpox, and that did not in like manner beneficially affect older people. To the question, what is that influence? there can be but one answer—vaccination. And it is easy to explain why there is an increased death-rate from smallpox in adults. Before vaccination was made compulsory the disease was so prevalent that the survivors from its attacks were a very appreciable number in the community, and they are now no longer so to anything like the same extent. As the having had smallpox is even a better preservative from the disease than vaccination itself, the number of adult people who were in this protected condition was sufficiently large to account for this change in the relative death-rate of old and young.\* But adult people can, by re-vaccination, make themselves as secure as vaccinated children.

In the parts of Sheffield where smallpox was prevalent in the outbreak of 1887-8, a house-to-house visitation was made to 59,807 houses, inhabited by 274,112 persons; and every particular regarding their age, vaccination or non-vaccination, their having had smallpox at any time, was obtained with respect to each inhabitant. During that portion of the outbreak that occurred, while Dr. Barry, of the Local Government Board, was in the town, it was known that 6088 cases of smallpox occurred, with 590 deaths. Of the above 274,112 persons, 70,495 were children under 10 years of age. In regard to these children—

Of every 1000 vaccinated	5 were attacked.
" " "	0·09 died.
Of every 1000 unvaccinated	101 were attacked.
" " "	44 died.

In other words, in equal numbers of vaccinated and unvaccinated children, for every nine of the former who died from smallpox, 4400 of the latter would die.

In regard to children living in houses in which smallpox occurred—

Of every 1000 vaccinated	78 were attacked.
" " "	1 died.
Of every 1000 unvaccinated	869 were attacked.
" " "	381 died.

In regard to persons over 10 years of age—

Of every 1000 twice vaccinated	3 were attacked.
" " "	0·08 died.
" " once	19 were attacked.
" " "	1 died.
" " not vaccinated	94 were attacked.
" " "	51 died.

In other words, in equal numbers of these three classes, for every 8 twice-vaccinated persons who died from smallpox, 100 once-vaccinated persons would die, and 5100 unvaccinated, showing that twice-vaccinated adults are six hundred and thirty-seven times, and once-vaccinated adults fifty-one times, as safe as unvaccinated ones.

\* See in reference to this the 43rd Annual Report of the Registrar-General, p. xxiii.

In regard to persons over 10 years of age living in houses in which smallpox occurred—

Of every 1000 vaccinated 281 were attacked.

14 died.

Of every 1000 unvaccinated 686 were attacked.

371 died.

In a handbill, headed "Sheffield, Vaccination, and False Prophets," recently issued by some anti-vaccinationist, the following passages occur:—"5035 VACCINATED PERSONS WERE ATTACKED, and 246 of them DIED. Amongst those attacked, moreover, were 12 *re-vaccinated* soldiers and 10 *re-vaccinated* policemen! Of course, Dr. Barry represents the unvaccinated as dying at a much higher rate, namely 32 per cent. But, obviously, *such figures are false, as statistics furnished by vaccinating authorities regarding the mortality of the unvaccinated almost invariably are.*"

An anonymous writer, charging a public man with making false statements, should avoid making false statements himself, especially when quoting the figures that he impugns. Dr. Barry distinctly states that the 12 soldiers referred to were *not* successfully re-vaccinated, and that the 10 policemen were not re-vaccinated at all. Furthermore, the anonymous writer carefully omits to state that the 5035 vaccinated persons were those attacked out of a community of 309,963 vaccinated, and that of the 6325 unvaccinated persons in Sheffield, 1980 were attacked and 408 died—that is, that while of the vaccinated population, 1 in 60 were attacked, and 1 in 1259 died; of the unvaccinated population, 1 in 3½ were attacked, and 1 in 15½ died. With such examples of anti-vaccination statistics, the remarks made in the quotation upon the statistics of vaccinating authorities are very graceful.

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## APPENDIX C.

### *NOTES on Cases of Smallpox treated at Mowbray Hospital, by DR. JAMES M. PARDEY.*

#### *Case 1.—Confluent Smallpox.*

##### (1.) ANNIE BRANCHFLOWER, Housewife, aged 26 years.

Resides in Trail's Lane, off Lower George-street. Taken ill Saturday, August 27th, 1887. Then had shivering, headache, pains all over her—especially across the loins—slight pain at pit of stomach. Was restless on Sunday, August 28th, but not delirious. Vomited on night of August 28th, and again on the 29th; the vomit was dark green in colour and bitter to taste. Had felt languid and tired for a week before August 27th, and had headache and dreamt at night. Had to take to bed on August 27th. On Monday, 29th, noticed an eruption of blood-stained blisters on her thighs, stated by the doctor attending (Dr. Murphy) to be purpuric in nature. On August 29th "red blotchy pimples" appeared on her forehead. About Thursday, September 1st, the eruption on the forehead got like "white blisters"; these quickly spread all over the body, there being very few on the feet. The blisters got fuller for three or four days, and on Thursday, September 4th, they became "depressed in the centre"; the "blisters" became yellow and got rounded on top and ran into one another about September 3rd or 4th. On September 6th and 7th could not put a pin's point between the vesicles; eruption not itchy; scabbed over on September 9th or 10th and dried up; the last scabs dropped off the face and body about the middle of September, but not off the feet till the end of September; the scabs were reddish-brown in colour. The skin of the neck and face was much swollen during eruptive stage. The patient does not appear to have noticed any distinct areola round the vesicles at any time. The eruption affected the throat and eyes, and she had great difficulty in swallowing. When the eruption was at its height pain and tension previously felt in the skin disappeared. After the eruption appeared she felt much better than previously, but when the eruption became pustular she felt alternately hot and cold—restless and sleepless and delirious at night. During convalescence had great pain in both collar-bones. Recovery was slow. Was admitted to Quarantine Station on September 27th. At this time her face, body, and limbs were marked with reddish-brown pits: she was convalescent at this time, and had no scabs on body. Was vaccinated at 10 years of age; had two fair marks on left arm. Shifted into convalescent tents on October 2nd. Discharged, cured, on October 24th, 1887.

#### *Case 2.—Discrete Smallpox.*

##### (2.) GEORGE BRANCHFLOWER, aged 2½ years.

Admitted to Quarantine Station, September 27th. Never vaccinated.

Taken ill on September 10th; came on like a "cold." On the 11th instant was fretful, sleepy, and feverish. On the 12th the rash came out on the face and legs in the form of "red pimples." On the 13th September he went to bed. The eruption quickly spread over the limbs, but very few appeared on the chest; the eruption was scattered—no difference in the skin between the papules; eruption never became vesicular or umbilicated. Few "scales" appeared on some parts of eruption, which were all separated by the 20th instant. Whilst his mother was ill he slept at Bishop's Temperance Hotel. On admission to the Mowbray Station had a few "mottled spots" on face, limbs, and chest. Has no well-marked pits. Put in convalescent tents on October 2nd. Discharged, cured, on October 24th, 1887.

*Case 3.—Discrete Smallpox.*

## (3) ADYE BRANCHFLOWER, aged 5 months.

Admitted to Quarantine Station, September 27th. Never vaccinated.

A week after his mother was taken ill, was sent to a house in Lower Brisbane-street. He stayed there a fortnight, and then was taken to Tamar-street, next door to the Railway Boarding-house. Came home again on Tuesday, September 13th. Was then suffering from bronchitis, and had spots on the face, hands, and chest. Some of the pimples were like "white blisters" on the hands and chest, and were depressed in the centre. There was one very large vesicle on the back. Only a few scattered vesicles became pustular. They scabbed over (date not known), and fell off about September 27th.

On admission to Quarantine Station had a few yellowish scabs on head and a few yellowish discolorations on head, face, chest, and legs. Has a few pits of no great depth in different parts of the body. The eruption was scattered. Put in convalescent tents on October 2nd. Discharged, cured, October 24th, 1887.

*Case 4.—Hæmorrhagic and Confluent Smallpox.*

## (4.) WILLIAM BRANCHFLOWER, aged 5 years.

Admitted to Quarantine Station, September 27th. Never vaccinated.

Taken ill, Sunday, September 11th, but felt tired for a few days previous to this. On September 11th felt tired—could not eat—thirsty—had shivering—no headache or pains. Had diarrhœa on September 11th, and vomited on the 11th and 12th. Was very stupid on the 11th, 12th, and 13th September. Was delirious on the 12th. Had a warm bath on the 13th, and then noticed the rash first on the forehead, and then on the thighs and abdomen. It then spread quickly all over the body. Eruption came out at first like "red blotches," and became "blistery" on the 16th or 17th. Two or three days after became depressed in the centre and ran into one another. About September 18th, the vesicles on face, body, and limbs ruptured in places. The whole skin was covered with eruption. It began to scab over on September 19th and 20th. The scabs began to separate from the arms, back, and abdomen on the 24th; is continually rubbing and scratching himself. On September 15th, smelt badly, and had to open the windows on this account. He improved slightly after the first appearance of the eruption, but became delirious and had shivering later on. The feet were much swollen.

On admission was in a dying condition. He was covered with dark blood-stained crusts from head to foot. Characteristic odour from sores. Very delirious, and calling out. Died on September 28th, at 1 A.M.

*Case 5.—Discrete Smallpox.*

## (5.) MARY JANE WHITE, aged 37 years, Ladies' Nurse.

Admitted to Station on September 27th, 1887. Vaccinated when 8 years of age. No good marks to be seen.

Taken ill on September 14th, and had to take to bed. Had felt languid, and had headache since September 10th. On September 14th, vomited; the vomit was greenish and bitter; had shivering headache, general pains, felt hot and cold alternately, pain in loins and pit of stomach, sweated profusely, loss of appetite, thirst, bowels confined all through illness, was sleepless. On September 17th noticed "red pimples" on her forehead; afterwards they appeared on the face, and then on hands and body. The rash was scattered. About the 20th the eruption became vesicular, the skin around the blisters being red. Her eyes and face were much swollen at this time, and she was giddy and could not stand. A few of the vesicles were depressed in the centre on September 24th. (This was noticed by Dr. Cotterell.) On September 24th a few vesicles were filled with "matter." On the 26th the eruption in places burst on the body and among the hair on the head. The vesicles did not burst on the face, but dried up and scabbed. The scabs began to separate on the 27th instant.

On admission her face had several large red papules on it, covered with small dry scales. The crusts were separating on the body and legs. Has a slight cough. On September 28th her temperature is normal, and the scales were nearly all separated from the body. Skin desquamating, the eruption on face still continues in the form of red papules, a few pits to be seen on body, arms, and legs, and a few mottled spots.

September 29th.—Temperature natural, skin still peeling, scabs still separating, eruption on face as before, mottling less marked.

October 2nd.—Shifted into convalescent tent, all scabs having separated.

Was living with Mrs. Branchflower, in Trail's Lane, when she was taken ill.

October 24th.—Discharged, cured.

*Case 6.—Discrete Smallpox.*

## (6.) WILLIAM BISHOP, Sen., aged 46 years, General Dealer.

Admitted to Quarantine Station, September, 27th, 1887. Vaccinated when a child—one good mark on left arm. Resides in William-street.

Taken ill on September 21st, and went to bed; got up next day, but had to return to bed. Had shivering, frontal headache, lightness in head, stiffness and pains in joints, no pain in back or abdomen. Vomited on September 23rd, vomit greenish, felt weak, and could not stand, had diarrhœa, sleeplessness, loss of appetite, not thirsty, had cough with whitish expectoration, skin felt hot and dry. On September

25th noticed a few red pimples on both wrists, some scattered ones also appeared on the face on the 26th, and afterwards on the body and legs. Has not been out of Launceston for 5 months. Has always been weakly, and subject to lumbago and sciatica. On admission a few rhonchi are heard over the front of the chest. Skin never itchy. Had been in the habit of visiting his daughter (Mrs. Branchflower) during her illness. There was no marked areola round vesicles.

September 28th.—Temperature, natural in morning, 100·4° F. in evening. Tongue coated, bowels not open, not sleeping. The eruption is now vesicular on face and arms, and scattered; no tendency to run together.

September 29th.—Temperature, 98·4° F. (m.); 99° F. (e.) Skin dry, scaly, peeling off, vesicles becoming pustular, and scabbing over on face and hands, eruption not umbilicated. Tongue red, indented, coated; slept well; bowels open.

September 30th.—Temperature, 99° F. (m.); 99·8° F. (e.) Eruption still scabbing over; cough worse. Has starting pain in right side of head. Has swelling on right side of face. Thirsty; eating well; sleeping fairly.

October 1st.—Temperature, 98·6° F. (m.); 98·8° F. (e.) Eruption all scabbed over; scabs separating on face and arms. Has rheumatic pains about body.

October 2nd.—Temperature, 98·4° F. (m.); 99° F. (e.) Has headache; scabs still separating; doing well.

October 3rd.—Temperature, 98·6° F. (m.); 99° F. (e.) Scabs all separated, only a few discolored patches and pimples left; only a few marked pits.

October 4th.—Temperature, 98·4° F. (m.); 99·8° F. (e.) Skin scaling off.

October 5th.—Temperature, 98·4° F. (m.); 99° F. (e.) Has pain across loins.

October 6th.—Temperature, 98·8° F. (m.); 99° F. (e.) Skin still peeling.

October 7th.—Is now convalescent.

November 11th.—Discharged, cured.

*Case 7.—Discrete Smallpox.*

(7.) HENRY ROBERT MURRAY, Aged 31 years, Draftsman.

Admitted to Quarantine Station, September 27th. Vaccinated when an infant. Has two good marks on right arm. Resides with William Bishop in William-street. Only 5 weeks from Victoria.

His illness began with cold shivering and vomiting, vomit of a coppery taste, pain in loins, headache, loss of appetite, no thirst, bowels regular, pains in abdomen, and diarrhoea on September 21st; was sleepless also. On September 25th, Dr. Pike noticed an eruption of red pimples on the right wrist, afterwards it appeared on the head and face, and then on the body and legs.

On admission to the Hospital his tongue was red at the edges, and thickly coated in the centre. Has some vesicles on the inside of the mouth and on the throat. Has vesicular eruptions scattered all over his body, and not tending to run together; some vesicles are umbilicated, contents clear, and vesicles are surrounded by a red areola; skin acting; organs healthy. Temperature, 98·4° F.

September 28th.—Temperature normal; morning and evening. Tongue coated, nausea, no vomiting, bowels open, eruption still vesicular and more profuse, less umbilicated, getting rounded. Has headache and sore throat. Has a sloughy patch on left tonsil. Pharynx red, and injected.

September 29th.—Temperature, 99° F., morning and evening. Eruption still vesicular, contents getting opaque, no umbilication, throat still sore, slough still adherent to tonsil, swallows with difficulty. Has headache and giddiness; not sleeping; bowels open.

September 30th.—Temperature, 98·4° F. (m.); 98·8° F. (e.) Eruption more plentiful on face and arms—now pustular—skin irritable and red, and swollen between the pustules. Eating better. Slough still adherent to left tonsil.

October 1st.—Temperature, 98·4° F. (m.); 98·6° F. (e.) Throat better, swallows better. Slough separating—eruption all pustular; some pustules bursting and scabbing over, others are drying up; crusts are of a golden colour.

October 2nd.—Temperature normal; morning and evening. Some pustules still bursting and scabbing over.

October 3rd.—Temperature normal; eruption all scabbed over; some scabs falling off.

October 4th.—Scabs still separating.

October 5th.—Scabs nearly all off.

October 6th.—Scabs all separated. Has only reddish discolorations and papules, and some well-marked pits where the pustules were.

October 7th.—Convalescent.

October 12th.—Shifted into convalescent tent.

November 1st.—Discharged, cured.

*Case 8.—Discrete Smallpox.*

(8.) SAMUEL ROWE, aged 3½ years.

Admitted to Quarantine Station, October 5th, 1887. Has never been vaccinated. Comes from Sydney Place, opposite *Tamar Hotel*. Taken ill Sunday, October 2nd; noticed he was not so bright as usual; was lying about and wanted to go to bed. No appetite, had thirst; bowels confined; sleepless, restless. Had shivering on October 4th. Never complained of pains or headache. Had no vomiting. On October 5th noticed an eruption of little red pimples on the forehead and face, and afterwards on the arms and

other parts of the body. He got livelier when eruption appeared, and wanted to get up. He had been taken to the house of Daniel Watson on September 23rd along with Maggie Rowe, who died from Small-pox on October 4th.

October 6th.—Temperature, 98·4° F. Has reddish papules on face, scattered, with red areola round them; most abundant on the legs, very few on body. Eruption on face, papular mostly; there are also a few vesicles which are umbilicated. Eruption on body coming out in form of small red pimples, as also on arms. Has a few umbilicated vesicles on legs and thighs, but here the eruption is most papular and scattered. Tongue red and coated. Takes food badly. Sleeps well. No cough.

October 7th.—Temperature, 100·6° F. (m.); 98·4° F. (e.) On face eruption is scattered, vesicular contents getting pustular, still some vesicles umbilicated; on body and legs eruption is scattered, vesicular and umbilicated. Tongue covered with vesicles, as also throat. Takes food badly. Sleeps well.

October 8th.—Temperature, 98·4° F. On face eruption pustular in many cases, other vesicles becoming so; no umbilication here now. On arms and legs pustulation not so far advanced.

October 9th.—Temperature, 98·4° F. Eruption pustular everywhere, not running together.

October 10th.—Temperature, 98·4° F. Eruption crusting over on face, still pustular and scattered on arms.

October 11th.—Temperature, 98·4° F. Scabs beginning to separate on face, body, and legs; small pits where scabs have separated.

October 12th.—Still losing scabs.

October 13th.—Scabs nearly all off, leaving rounded pits.

October 22nd.—Scabs all off.

October 23rd.—Up for first time.

October 24th.—Shifted into convalescent tents.

November 11th.—Discharged, cured.

#### *Case 9.—Confluent Smallpox.*

(9.) THOMAS HAWKINS, aged 76 years.

Admitted to Quarantine Station on September 27th, 1887. Vaccinated when a child, has two marks on left arm. Taken ill on September 20th; complained of frontal headache, thirst, shivering, faintness; no general or lumbar pain. Bowels regular. On September 21st took to bed. It was then noticed he had an eruption of "little blisters" on chest and shoulders; these afterwards appeared on the face and head. On the 25th noticed the same eruption on the arms and legs. The "blisters" were depressed in the centre and had a well-marked areola around them, but Mrs. Pearson (who gives the history) cannot state the date. He was living in Bryant's Lane where Emily Speers, his grand-daughter, died of smallpox on September 26th, 1887.

September 29th.—Temperature, 98·4° F. (m.); 98·8° F. (e.) The eruption was pustular and beginning to scab over all over body on admission, and emitted the characteristic odour. Scabs are brownish-red in colour. General health good.

September 30th.—Temperature, 98·4° F. Scabs separating in parts. Keeping well; sleeps almost continually.

October 1st.—Numerous pits and discolorations left where crusts have separated.

October 4th.—All crusts separated; now convalescent.

October 7th.—Shifted into convalescent tents.

November 2nd.—Discharged, cured.

#### *Case 10.—Hæmorrhagic and Confluent Smallpox.*

(10.) BENJAMIN LARTER, aged 38 years; Labourer; Married.

Admitted to Quarantine Station, 7th October, 1887. Was never vaccinated. Resides in Lower George-street, next to Tynan's Hotel.

Had to take to bed on 1st October, but had been ailing for two or three days previous to this. Complained of giddiness, lumbar pain, rigors. Vomited on the fifth day of illness; vomit black like ink; loss of appetite, thirst, frontal headache, no abdominal pain. Noticed the eruption on 6th October on his forehead and head, also a little on the chest; it appeared first in form of "red pimples," shotty to feel, not vesicular, running together on the face, scattered on the chest and arms. Has few scattered red papules on legs; tongue red and coated. Has diarrhœa, slight cough, sleeplessness. Pulse, 84, soft; temperature, 101° F. on admission. Had visited Daniel Watson on the 19th and 21st September.

October 8th.—Temperature, 98·8° F. (m.); 102° F. (e.) Eruption still papular on face and running together; not much eruption on chest and arms; few scattered papules on legs; not taking food; sleeping badly. Has diarrhœa still.

October 9th.—Temperature, 98·4° F. (m.); 100·8° F. (e.) Eruption on face vesicular, confluent, and umbilicated; on arms eruption much thicker, as also on back; still discrete on legs, getting vesicular everywhere. Has vesicles in mouth and throat; tongue red, coated; diarrhœa less. Slept fairly. Pulse, 78, soft.

October 10th.—Temperature 99·4° F. (m.); 100·8° F. (e.) Eruption on face vesicular, confluent, and umbilicated; face much swollen, also eyelids; eruption on chest and back same as on face; vesicles still discrete on legs, but umbilicated. Eyes feel gritty; has vesicles on conjunctivæ. Pulse, 84. Takes food better.

October 11th.—Temperature, 99·4° F. (m.); 101·2° F. (e.) Eruption on face much darker, hæmorrhagic, drying up in places; confluent on chest; on legs vesicles are getting opaque; face much swollen; constantly scratching skin. Takes food and sleeps well. Pulse, 118.

October 12th.—Temperature, 99·2° F. (m.); 100·8° F. (e.) Eruption on face pustular and dark, scabbing about mouth; on chest not so opaque, but still umbilicated. Vesicles confluent and hæmorrhagic on legs. Tongue dry and coated. Takes very little food. Has diarrhœa. Slept fairly. Pulse, 108, soft. Has difficulty in swallowing.

October 13th.—Temperature, 100° F. (m.); 102·2° F. (e.) Eruption still pustular on face—beginning to scab; on chest now pustular; on arms pustular in centres, as also on legs. Tongue dry. No diarrhœa now. Pulse, 114, soft.

October 14th.—Temperature, 100·4° F. (m.); 102·6° F. (e.) Eruption on face all scabbed over; scabs very dark. On neck and chest pustular still. Red areola around pustules, which are all run together. Eruption has same characters on legs and arms as on chest. Pulse, 120. Tongue dry; no diarrhœa. Takes food well. Delirious; not sleeping.

October 15th.—Temperature, 101·8° F. (m.); 103° F. (e.) Eruption scabbed all over body and head; nose obstructed with scabs. On legs and arms eruption pustular, dark in colour, rounded on top. Tongue dry; no diarrhœa. Did not sleep at all. Face greatly swollen; cannot see at all.

October 16th.—Temperature 102·6° F. (m.) Eruption drying up on arms and legs now. Areola very dark around remaining pustules. Tongue dry; sordes on teeth. Has *subsultus tendinum*. Pulse, 132, very soft. Respiration quickened. Has some pneumonia at base of either lung. Very delirious; getting out of bed. Result—Died 16th October, at 4·45 P.M.

*Case 11.—Semi-confluent Smallpox.*

(11.) DAVID STORRER, aged 33 years; Undertaker.

Admitted to Quarantine Station on 8th October, 1887. Was vaccinated when a child.

Taken ill on Wednesday, 5th October, exactly 12 days after the death of Daniel Watson, whom he confined and buried. Then felt tired; loss of appetite. On Thursday he took to bed. No shivering, slight pains in back of neck; no lumbar pain; soreness in epigastrium; no vomiting or headache; sleepless. Eruption appeared on 8th October on the forehead in form of scattered red pimples; then on face and chest and a few on the thighs. Felt better now eruption is coming out. Has a slight eruption on the throat. He buried Daniel Watson on 24th September, and Emily Speers on 27th September.

Tongue coated, moist. Bowels open. Pulse, 90, good. Temperature, 103° F. (e.)

October 9th.—Temperature, 98·6° F. (m.); 99·8° F. (e.) Eruption on face more profuse, and running together in places; getting vesicular. On chest eruption is scattered—slightly vesicular; on legs scattered and papular. Slept badly. General health good.

October 10th.—Temperature, 98·4° F. (m.); 99·2° F. (e.) Eruption on face and chest vesicular; not umbilicated; getting pustular in places. On legs still shotty and papular, with a few vesicles scattered here and there. Sleeping better.

October 11th.—Temperature, 98·4° F. (m.); 99° F. (e.) Eruption on face and chest pustular; not confluent. On legs vesicular, but contents are opaque; some vesicles here are umbilicated; skin between red. Pulse, 60, good.

October 12th.—Temperature 98·4° F. (m.); 98·6° F. (e.) On face eruption is pustular, running together on forehead; pustules are acuminate on body and arms; few scattered pustules on legs. Pulse, 72.

October 13th.—Temperature normal. Pustules drying on face, chest, arms, and legs; some scabs separating.

October 14th.—Crusts separating, leaving minute pits.

October 15th.—Still separating, leaving reddish papules with central pits. To get up.

October 20th.—Scabs all off.

October 25th.—Shifted into convalescent tents.

November 11th.—Discharged, cured.

*Case 12.—Hæmorrhagic and confluent Smallpox.*

(12.) HENRY CHICK, aged 25 years.

Admitted to Quarantine Station, October 8th. Never vaccinated. Taken ill, Wednesday, October 5th. Had headache, lumbar pains, no vomiting, no general pains or loss of appetite; was thirsty. Bowels confined. Eruption first noticed on October 8th, on forehead, as red pimples. Pulse 120. Tongue red. Is sleepless.

October 9th.—Temperature, 102·8° F. (m.); 103·2° F. (e.) Eruption coming out thickly on face, and is now also thick on body and limbs, papular and shotty to touch. Tongue dry; bowels open; takes food well; pulse 120, fair; not sleeping; slightly delirious.

October 10th.—Temperature, 102·6° F. (m.); 103° F. (e.) Face greatly swollen; eruption still raised and papular. Has purpuric spots about ankles, where the eruption is now vesicular and umbilicated. Conjunctivæ swollen and injected.

October 11th.—Temperature, 101·6° F. (m.); 99·2° F. (e.) Eruption on face vesicular, contents of vesicles blood-stained; skin red and swollen, eyelids much swollen. Conjunctivæ are hæmorrhagic. vesicles running together; on chest and legs eruption is vesicular and hæmorrhagic; vesicles very slightly raised, except on neck, where they are umbilicated. Tongue dry; has coughed up some blood; not taking food; sleeps badly; pulse 98, soft. Has dulness over base of right lung, and moist râles on auscultation. Heart sounds weak.

October 12.—Temperature, 101·4° F. (m.); 101·8° F. (e.) Face much swollen; purpuric; eyelids swollen; conjunctivæ chemosed; cannot bear the light. The eruption is vesicular, hæmorrhagic, and

confluent all over the body. Tongue thickly coated, dry; bowels open; not sleeping; delirious; getting out of bed; pulse very small and quick. Has hæmaturia, also spits up blood; mouth covered with eruption. He had visited Rowe's house on Sunday, September 25th. Result—Died, October 12th, at 11:40 p.m.

*Case 13.—Hæmorrhagic and confluent Smallpox.*

(13.) CATHERINE WILKINSON, aged 27 years.

Admitted to Quarantine Station, October 12th. Vaccinated when a child. No marks to be found. Taken ill on October 7th with frontal headache, shivering, felt cold and hot alternately; loss of appetite; thirst; vomiting, vomit bilious. Has pain in back on October 8th; had abdominal pain, but no general pains. Has diarrhœa; has had epistaxis, and cough with expectoration of whitish mucus; breath foul; sleepless. Eruption appeared on Saturday, October 8th; noticed first on the legs; two days after appeared on chest, and on the 12th on the face, came out in form of petechiæ with slightly rounded pimples; face now swollen; eruption dark in colour and much raised; contents blood-stained in few vesicles on face at present; around mouth, chest, and legs has dark petechiæ and slightly raised papules. Tongue red; has hæmorrhagic spots on it; has sore throat and dysphagia; rhonchi heard over front of chest; friction and râles heard over base of right lung. Temperature, 103.4° F. on admission. Has been working for some of the infected families.

October 13th.—Temperature, 102° F. (m.); 100.6° F. (e.) Has petechial eruption on face, skin raised as a whole, and under it has blood-stained serum, on chest has same characters; eyelids swollen and discoloured. Pulse 120, soft; has been bleeding from nose, mouth, and vagina; not taking food; slept badly; urine contains blood. Result—Died, October 14th, at 7:30 a.m.

*Case 14.—Confluent Smallpox.*

(14.) ALEXANDER LESLIE MARSHALL, aged 3 years.

Admitted to Quarantine Station on October 11th, 1887. Never vaccinated. On October 6th was seen to be hot and feverish; shivering occasionally; could eat well. Had to take to bed on October 7th, after having had a convulsion; had four fits during the day; was thirsty; had no pain. Slept badly on October 6th. The eruption came out on October 7th on the chest in form of "small red round pimples;" they came out on the face, legs, and arms almost at the same time, but after the eruption appeared on the chest. On October 10th the papules got vesicular, and on the 11th were umbilicated. Temperature, 98.4° F.

October 12th.—Temperature, 98.8° F. (m.); 100.6° F. (e.) Eruption on face vesicular, confluent and umbilicated; on hands, face, and arms scattered and vesicular and umbilicated; thicker on legs, vesicular and umbilicated. Tongue moist, red, coated; takes food; bowels not open; sleeps well.

October 13th.—Temperature, 101° F. (m.); 99.2° F. (e.) On face eruption is becoming pustular, and rounded on top; on eyelids, where he has rubbed, the eruption is scabbing; eyelids and face much swollen; on arms and legs eruption is now confluent, vesicular, surrounded by red areola, and still umbilicated. Had diarrhœa through the night. Pulse small, quick.

October 14th.—Temperature, 99.8° F. (m.); 101.4° F. (e.) Eruption on face pustular, rounded, confluent; face much swollen; skin red; vesicles getting opaque on arms and legs; slept badly.

October 15th.—Temperature, 101.8° F. (m.); 102.6° F. (e.) Eruption crusting over about nose, mouth, and eyes, where he scratches; still pustular on rest of face; on chest has scattered pustules with red areola; on arms and legs has some umbilicated vesicles still, but is mostly pustular and confluent, and rounded with red areola surrounding pustules; face and eyelids much swollen. Pulse soft.

October 16.—Temperature, 101.6° F. (m.); 100.6° F. (e.) Eruption on face all scabbed over; scabbing over on chest, arms, and legs in places, but still mostly pustular and confluent. Face less swollen; takes food well; delirious through night, but slept fairly.

October 17th.—Temperature, 102.2° F. (m.); 102.4° F. (e.) Some scabs falling off face; still some rounded pustules on legs and arms; all umbilication lost. Pulse weak. Doing well.

October 18th. Temperature, 100.6° F. (m.); 101° F. (e.) Scabs still separating from face; has some pustules still on legs and arms; some crusts also separating here. General health good.

October 19th.—Temperature, 99.6° F. (m.); 100.4° F. (e.) Scabs falling off face, leaving deep pits in places; still has a few pustules on legs and feet. Scabbing all over the body; scabs being shed every where. Sleeps well; tongue still thickly coated; bowels open.

October 20th.—Temperature, 100° F. (m.); 98.8° F. (e.) Scabs still separating, leaving marked pits; skin very red.

October 21st.—Temperature, 99.2° F. (m.); 99.8° F. (e.) Scabs still separating.

October 22nd.—Temperature, 100° F. (m.); 99.4° F. (e.) Still losing crusts.

October 23rd.—Temperature, 99.6° F. (m.); 100.2° F. (e.) The most of crusts have separated, leaving decided pits.

October 24th.—Temperature, 99° F. (m.); 99.4° (e.) Has only a few crusts on head now; body and legs quite clear.

October 25th.—Temperature, 99.6° F. (m.); 100.6° F. (e.) Has few scabs still among hair.

October 26th.—Temperature, 99.8° F. (m.); 100.6° F. (e.) Doing well.

October 28th.—Temperature, normal. Crusts all separated; has marked pitting and mottling everywhere. To have a bath. Convalescent.

November 2nd.—Put in convalescent tents.

November 25th.—Discharged, cured.

*Case 15.—Discrete Smallpox.*

(15.) SAMUEL HOUSTON, aged 35 years, labourer.

Admitted to Quarantine Station, October 12th, 1887. Vaccinated when a child; has two good marks on left arm. Taken ill on October 5th. Then had headache, loss of appetite, thirst. He vomited on the 6th, but did not notice the characters of the vomit; no pains in any part except a slight crampy pain in abdomen. Bowels open after aperients; sleeplessness. Eruption came out on October 9th in evening, first on face and then on body and legs; it came out first as small red pimples; this disappeared, and got slightly raised and "blistery." Temperature, 99·8° F. on admission. Has sore throat; has some eruption on throat; pulse 60. Was employed disinfecting some houses in which smallpox broke out on Saturday, October 8th, and on October 4th confined Rowe's child; he also disinfected the s.s. Devon (which has carried Smith to the Don) on September 30th.

October 13th.—Temperature, 98·4° F. (m.); 99·4° F. (e.) Eruption on face scattered; pustular, with red areola round; eruption pustular, and discrete on chest, body, and legs; pulse 72, good; has no symptoms.

October 14th.—Temperature, normal, night and morning. Eruption scabbing in place on face as also on body.

October 15th.—Scabs still separating; scabs light yellow in colour. To get up. Is convalescent.

October 20th.—Scabs all separated.

October 24th.—Put into convalescent tents.

November 11th.—Discharged, cured.

*Case 16.—Confluent Smallpox.*

(16.) HENRY GEORGE WATSON, aged 1 year 11 months.

Admitted September 27th, 1887. Was never vaccinated. Was living at Mrs. White's, in Frederick-street, till September 26th. Was hot and feverish at first, and fretful; eruption was noticed on third day on the face and body; it was scattered; has got more plentiful since and run together; was like red pimples at first; it became vesicular and ran together on fifth day; the vesicles became larger on the sixth day; was very thirsty.

September 28th.—Eruption vesicular, confluent, and surrounded by an areola on face and body; less profuse on legs and not so far advanced; not eating well; has characteristic odour.

September 29th.—Eruption thicker; vesicles on face umbilicated; still surrounded by an areola; face swollen; not sleeping; not eating well.

September 30th.—Temperature, 100·6° F. (m.); 102° F. (e.) Eruption thicker; vesicles more marked on face—umbilicated still; thicker on legs and chest and umbilicated. On pricking vesicles with a needle the central portion empties whilst the circumference remains full; bowels open; slept fairly; not eating food.

October 1st.—Temperature, 101·8° F. (m.); 102·6° F. (e.) Eruption profuse all over body; umbilicated everywhere; getting pustular; slept well; not eating; bowels open.

October 2nd.—Temperature, 101·4° F. (m.); 102·4° F. (e.) Eruption pustular and rounded; restless; scratches himself very much; where he has scratched himself on face large scabs have formed; slept badly; appetite poor; bowels open.

October 3rd.—Temperature, 102·2° F. (m.); 103·6° F. (e.) Eruption more pustular; scabbing on face where it has been scratched; slept badly; delirious; has diarrhoea; not eating.

October 4th.—Died at 6·30 a.m.

*Case 17.—Discrete Smallpox.*

(17.) STEWART RALSTON WATSON, aged 3½ months.

Admitted September 27th, 1887.

Never vaccinated. Resides next to Branchflower's, in Trail's Lane. Noticed the child had not taken the breast well, and was fretful and not sleeping. About three or four days after these symptoms came on the mother noticed a papular eruption on the forehead, head, and face; also a slight eruption on body and legs of a similar kind. This was noted on September 28th. The child was then removed into smallpox ward.

September 29th.—Temperature, 101·2° F. (m.); 101·6° F. (e.) Eruption thicker on face and chest; doing well; now taking the breast better; sleeping well.

September 30th.—Temperature, 100·5° F. (m.); 102° F. (e.) Eruption more plentiful on face and head; extending and getting more profuse all over body, becoming vesicular; contents of vesicles clear; bowels open; takes food well, but sleeps badly.

October 1st.—Temperature, 98·6° F. (n. and m.) Eruption is now umbilicated on face; mostly papular still on legs, and scattered; not feeding so well; slept well.

October 2nd.—Temperature, 98·4° F. (m. and e.) Vesicles more cloudy on face; semi-confluent; has hiccough; otherwise doing well.

October 3rd.—Temperature, normal. Eruption now pustular on face, with red areola around; vesicles cloudy on legs, but still umbilicated.

October 4th.—Temperature, 99° F. (m.); 99·4° F. (e.) Takes breast well; still has pustules on face with rounded tops; still some umbilication of pustules on legs.

October 5th.—Temperature, 99° F. (m.); 99·4° F. (e.) Eruption pustular throughout; some pustules on head are drying up; semi-confluent; Restless at night.



October 6.—Temperature, 99·4 F. (m.); 98·8 F. (e.). Very few pustules on body; still drying up on head and face.

October 7th.—Temperature, 98·6° F. (m.); 99·2 F. (e.). Eruption drying up and scabbing all over body; scabs separating in places; child very bright.

October 8th.—Temperature, normal, night and morning. Scabs dropping off, leaving pimples behind, but no marked pits.

October 9th.—Temperature, 101·2 (e.). Scabs still separating.

October 15th.—Temperature, normal for some days. Scabs still separating.

October 19th.—All scabs separated; has few small pits on face and head; several discoloured patches where scabs have separated; convalescent.

October 24th.—Put in convalescent tents.

November 11th.—Discharged, cured.

#### Case 18.—*Hæmorrhagic and Confluent Smallpox.*

(18.) CECILIA HINDS, aged 33 years, Housewife.

Admitted October 1st, 1887.

Never vaccinated. Comes from Radford's Row, in William-street. On arrival was put in female smallpox ward. On September 26th felt ill and knocked up. Took to bed on October 1st. Had headache, pains in loins and body generally; shivering; vomited twice on October 1st; vomit greenish; loss of appetite; thirst; bowels not open. Temperature, 102·4 F. on admission. Has a few red papules on left arm.

October 2nd.—Temperature, 103·4° F. (m.); 104·8° F. (e.). Tongue coated; no appetite; thirsty; vomited several times through night; bowels not open; has headache; not sleeping; feet cold; perspiring freely; has several vesicles on left arm, with clear contents, not depressed in centre.

October 3rd.—Temperature, 103·8° F. (m.); 103·6° F. (e.). Has a papular eruption all over her body; skin very red; has headache still; slept well; not eating; vomited several times; has nausea; bowels well opened.

October 4th.—Temperature, 103·4° F. (m.); 104° F. (e.). Not perspiring so freely; has "noises" in head; vertigo; no sleep; still vomiting everything; has sore throat; bowels freely open; less pain in back; throat and palate covered with eruption; eruption thick all over body; has petechial hæmorrhages into skin; eruption becoming vesicular, not umbilicated, contents slightly blood-stained.

October 5th.—Temperature, 102·4° F. (m.); 102·6° F. (e.). Skin very irritable; skin between the vesicles red and purpuric; face and eyelids swollen; eruption more decidedly vesicular; contents blood-stained; few vesicles umbilicated; eruption spread all over body and confluent; throat still sore, covered with vesicles; no vomiting; tongue red; taking food better; has cough; has dulness over base of either lung, with numerous râles and rhonchi; heart sounds weak; slept fairly; is delirious; dreams a great deal. Pulse 78, soft.

October 6th.—Temperature, 100·4° F. (m); 101·8° F. (e.) Eruption on face, body, and limbs, confluent, vesicular, and umbilicated. Contents are getting deeper in colour from blood-staining; skin between is red and purpuric; face much swollen; has vesicles all over inside of mouth and throat; takes food badly. Pulse 96; compressible; very delirious.

October 7th.—Temperature, 100·4° F. (m); 101·2° F. (e.) Eruption on face, chest, and arms. Eruption is vesicular, hæmorrhagic, confluent. There is still some umbilication of vesicles in places; skin purpuric. On legs eruption still vesicular, umbilicated, and hæmorrhagic. Face much swollen; tongue and mouth still covered with eruption; bleeding from mouth; not taking food well; throat still sore; coughing still; expectoration blood-tinged, frothy; has rhonchi over chest anteriorly; dulness at bases with râles; very delirious; not sleeping.

October 8th.—Temperature, 100·2° F. (m.); 104° F. (e.) In the eruption on the face the fluid in vesicles has been absorbed, and the skin is flattened down. Has pustulation on eyelids. On the legs eruption is more decidedly hæmorrhagic; skin purpuric; cough troublesome; takes very little food or stimulant; did not sleep; very delirious, getting out of bed. Pulse, 124; irregular.

October 9th.—Temperature, 102° F. (m.); 104·6° F. (e.) Eruption on face flattened down, all fluid having been absorbed from vesicles. On chest the vesicles are still full of blood, as also on the limbs. Pulse, 142, respiration, 60. tongue coated and covered with eruption; no appetite; very delirious, getting out of bed; still coughing; slept badly. Died at 8·5 P.M., October 9th.

#### Case 19.—*Confluent Smallpox.*

(19.) WILLIAM BISHOP, JUN., aged 8 years.

Admitted September 27th, 1887. Never vaccinated.

On October 1st, he was noticed lying about the Quarantine Station. Would not play as usual; face flushed; vomiting of bile-stained matter; has pain in pit of stomach; no sign of any eruption.

On October 2nd his body heat was 102·8° F. in the morning, and 105° F. in the evening. Kept in bed; no appetite, thirsty; has pains all over him; no special lumbar pain; pulse quickened; no sign of eruption; still vomiting.

October 3rd.—Temperature, 101·4 F. (m.); 102·2 F. (e.) Was shifted into male smallpox ward, a papular eruption having appeared on back of left wrist and on his face. In evening the eruption had appeared on the body.

October 4th.—Temperature, 101·8° F. (m.); 101·4 F. (e.) Now has papular eruption, shotty to the finger on face, head, and legs; very few papules on the body; slightly delirious; slept well; no vomiting; takes food better. Pulse, 120; good.

October 5th.—Temperature, 100.4° F. (m.); 102.6° F. (e.) Eruption much thicker on face and arms; skin between red and swollen; some papules getting vesicular on face and running together; on the body the eruption is still papular and scattered; distinct red areola around vesicles on face; few vesicles here are umbilicated; has eruption on mouth and throat; has cough; few rhonchi heard over front of chest; tongue red at edges, coated in centre; bowels open; takes food; no vomiting; restless and delirious; urine had to be drawn off. Pulse, 120.

October 6th.—Temperature, 101.4 F. (m.); 101.4° F. (e.) Eruption vesicular all over, umbilicated, contents of vesicles clear, confluent on face, arms, and body; semi-confluent on thighs and legs; few vesicles on face and arm, are opaque and pustular, rounded at apices; pulse, 132; compressible; less cough; no dysphagia; still delirious; slept a little; cannot stand the light; no eruption on eyes.

October 7th.—Temperature 99.8° F. (m.); 103.2 F. (e.) Eruption on face now pustular, rounded on top, confluent, commencing to crust over about nose and mouth, where he rubs and scratches it. On arms and legs vesicles more opaque, rounded; skin very irritable; have to muffle hands to keep him from scratching himself; face less swollen; pulse, 120, soft; tongue dryish; still sleepless and delirious.

October 8th.—Temperature, 99.8° F. (m.); 102.8° F. (e.) Eruption crusting over on face and neck where irritated. Still pustular on hands and arms. Legs covered with confluent pustules with rounded apices. Pulse, 120, soft. Slept badly; delirious.

October 9th.—Temperature, 99.8° F. (m.); 102.6° F. (e.) Pulse, 132. Eruption still scabbing on face. On the body scattered pustules are drying up; on arms and legs, the pustules are confluent, not scabbing yet. Tongue dry. Slept well.

October 10th.—Temperature, 98.4° F. (m.); 101° F. (e.) Still scabbing on face and body; pustules not scabbing yet on legs and arms. General health better.

October 11th.—Temperature, 98.8° F. (m.); 101.4° F. (e.) Pulse, 120; face all scabbed over; few scabs separating from face; pustules still large, rounded, and confluent on arms and legs. Takes food, and sleeps fairly.

October 12th.—Temperature, 98.8° F. (m.); 99.8° F. (e.) Pulse, 108, soft. Scabs still separating on face, leaving marked pits. On his hands the pustules are drying up and crusting; on the arms and legs a few pustules here and there are drying up. Throat much better. Delirious again through night.

October 13th.—Temperature, 99.4° F. (m.); 100.4° F. (e.) Eruption scabbing everywhere; scabs separating in places, leaving well marked pits; no swelling of face now; tongue red, clean; bowels open. Slept fairly.

October 14th.—Temperature, 98.8° F. (m.); 100.4° F. (e.) Still losing crusts. General health good.

October 15th.—Temperature, 98.4° F. (m.); 100.4° F. (e.) Still has scabs on arms and legs; mostly separated on face, leaving pits.

October 16th.—Temperature, 99.4° F. (m.); 98.8° F. (e.)

October 17th.—Temperature, 98.4° F. (m.); 99.4° F. (e.)

October 18th.—Temperature, 98.4° F. (m.); 98.8° F. (e.)

October 19th.—Temperature, 98.4° F. (m.); 99.4° F. (e.)

October 23rd.—Temperature, normal. All scabs separated, except among hair.

October 25th.—Convalescent. Pitted very much on face and hands.

November 11th.—Discharged, cured.

#### Case 20.—*Confluent Smallpox.*

(20.) ALFRED BENNETT, aged 4½ years.

Admitted October 2nd, 1887. Never vaccinated. Comes from Lower Charles-street. On the morning of September 28th he had headache and pains in the stomach, loss of appetite, thirst, vomited at first; vomit watery. Eruption was first noticed on October 1st in the evening, on the back of the hands, in the form of small red "blotches." It came out on the face on October 2nd. Temperature, 104° F. on admission. Has papular eruption on arms, face, and chest on admission; skin generally very red.

October 3rd.—Temperature, 99° F. (m.); 99° F. (e.) Eruption has now appeared on legs, much thicker on face, arms, and body; still papular and shotty to feel. Has few small vesicles with clear contents on the face. Tongue red, coated; bowels not open. Takes very little food; delirious; slept badly. Heart and lungs healthy.

October 4th.—Temperature, 98.6° F. (m.); 101.4° F. (e.) Pulse good. Eruption now vesicular all over body; contents clear, confluent, umbilicated. Slept better, but still delirious. Not eating.

October 5th.—Temperature, 99° F. (m.); 101.6° F. (e.) Pulse 132, jerky. Eruption on face (where it has been irritated by rubbing) is pustular and confluent and rounded in form. Skin red and swollen, eyelids much swollen. On neck, body, and limbs eruption is still vesicular and umbilicated; has vesicles on tongue, mouth, and throat. Eyes bloodshot, cannot stand the light; skin very irritable, have to muffle his hand to prevent him scratching himself.

October 6th.—Temperature, 99.2° F. (m.); 101.8° F. (e.) Face is now a bladder of pus; cannot see his eyes. On body and limbs vesicles are now opaque, mostly losing umbilication. Takes food poorly; bowels not open; very delirious; constantly scratching and rubbing himself.

October 7th.—Temperature, 100.4° F. (m.); 102.6° F. (e.) Face still like bladder of matter. On arms, legs, and body the eruption is now pustular, confluent, rounded on top; skin red and swollen; eyelids closed, cannot see his eyes. Delirious, getting out of bed; not sleeping; not taking food.

October 8th.—Temperature, 102.4° F. (m.); 104.2° F. (e.) Eruption beginning to dry on face, especially about the mouth and nose where he has scratched it. Eruption as before on rest of body; still delirious. Has cough; dulness over base of right lung, with tubular breathing and increased vocal resonance.

October 9th.—Temperature, 100·8° F. (m.); 103·2° F. (e.) Pulse, 132, jerky, soft. Eruption drying up, and scabbing on face; on chest the pustules are bursting and drying up; on legs still pustular and rounded on top, not drying up. Takes food, and sleeps better.

October 10th.—Temperature, 100·6° F. (m.); 101·4° F. (e.) Face all scabbed over; still pustular on legs.

October 11th.—Temperature, 99·8° F. (m.); 102·2° F. (e.) Face, head, and chest covered with scabs. Pustules on limbs bursting and drying up and crusting over. Pulse very quick and small. Takes food better. Has characteristic odour about him.

October 12th.—Temperature, 101·2° F. (m.); 101·6° F. (e.) Scabs are beginning to separate from face and head. On legs and arms there are still some rounded pustules, but most of them are scabbing. Mouth dry; tongue dry; bowels open; takes liquid food; slept badly; pulse still fast.

October 13th.—Temperature, 101·4° F. (m.); 101° F. (e.) Scabs still falling off face and chest and hands, few falling off legs; slept well; pulse 132, very soft.

October 14th.—Temperature, 99·4° F. (m.); 102·4° F. (e.) Scabs separating everywhere, leaving dark red pits. Tongue still dry; slept badly; takes plenty of milk; pulse 120, soft.

October 15th.—Temperature, 98·4° F. (m.); 101·4° F. (e.) Still losing scabs. Doing better.

October 16th.—Temperature, 99·6° F. (m.); 100·6° F. (e.) Pits are well marked on forehead and about nose and on back of hands. Left eyelid much swollen. Has chemosis of left eye; small pustule over outer part of left cornea. Cough much better. His right lung has now cleared up.

October 17th.—Temperature, 99·4° F. (m.); 101·6° F. (e.) Eye no better.

October 18th.—Temperature, 100° F. (m.); 101·2° F. (e.) Scabs still separating, leaving well-marked pits. Left eye still chemosed—cannot see the cornea now. Doing well generally.

October 19th.—Temperature, 99·4° F. (m.); 100·8° F. (e.) Cannot see cornea yet on account of the chemosis.

October 21st.—Temperature, 98·4° F. (m.); 101·4° F. (e.) Scabs still separating in different parts of body, leaving well-marked pits and discolorations; muco-purulent discharge from left eye; pustule on cornea healing.

October 23rd.—Temperature, 101·2° F. (m.); 100·6° F. (e.) Scabs still separating. Has marked pitting. Eye much better.

October 24th.—Temperature, 100·4° F. (m.); 102° F. (e.) Has a cold. Still some chemosis of left eye.

October 25th.—Temperature, 100° F. (m.); 101° F. (e.) Has several small abscesses on head and neck. Cold a little better.

October 27th.—Temperature, 99·4° F. (m.); 103·4° F. (e.) Some abscesses have burst and are discharging. Crusts still separating.

October 28th.—Temperature, 99·6° F. (m.); 101·6° F. (e.) Has thin purulent discharge from right ear.

October 30th.—Temperature, 98·4° F. (m.); 100° F. (e.) Still has discharge from right ear, but less in quantity. Scabs mostly separated. Abscesses healed.

November 1st.—To get up—much better. Left eye and right ear much better.

November 3rd.—Convalescent. Has a little discharge from right ear still.

November 5th.—Has purulent discharge from left ear now. Shifted in convalescent tents.

November 20th.—Discharge from ears better.

November 25th.—Discharged, cured.

#### Case 21.—*Confluent Smallpox.*

(21.) SUSANNAH WATSON, aged 39 years, Housewife.

Admitted on October 5th, 1887.

Was vaccinated when a child. Has only one indistinct mark on left arm. First felt ill on October 2nd. Had pain in the loins and back, headache, felt weak and faint; shivering; loss of appetite; vomiting of yellowish material; no pain at pit of stomach. On October 3rd noticed some red pimples on her arms; these afterwards appeared on the face and body, getting larger and shotty to feel; they afterwards appeared on the legs. Temperature, 104·4° F. on admission. Skin dry.

October 6th.—Temperature, 101·6° F. (m.); 102·8° F. (e.) On face papules are becoming vesicular in places and running together. Skin red and swollen. Very few papules on legs, but they are more numerous on the chest and back, and shotty under the finger; tongue coated; takes food badly; bowels open; no vomiting; slept badly. Has pain in back still.

October 7th.—Temperature 101·8° F. (m.); 102·4° F. (e.) Eruption on face vesicular now, contents clear, umbilicated in a few cases; confluent; skin between red. On arms now vesicular and confluent—on chest vesicular and discrete; semi-confluent on legs and feet. A great number of red petechiæ about body and limbs. Has eruption on throat. Takes food and sleeps badly. Has sore throat and headache. Pulse 96, fair. Conjunctivæ injected.

October 8th.—Temperature, 99·8° F. (m.); 100·6° F. (e.) Eruption still vesicular, umbilicated, and confluent; skin between red and swollen. On chest the eruption is same as on face, excepting it is discrete. On legs scattered, vesicular, and umbilicated. On pricking vesicles with a needle, central portion empties whilst circumference remains as before. Not sleeping or eating. Pulse 96. Throat still sore. Bowels not open.

October 9th.—Temperature 99·4° F. (m.); 100·4° F. (e.) Eruption as before, beyond that it is more plentiful on legs. Pulse, 112. Has cough. Few râles heard over bases of lungs. No dulness on percussion.

October 10th.—Temperature 100° F. (m.); 100·4° F. (e.) On face the eruption is getting pustular, confluent, rounded on top, on arms not so opaque as on face, and still umbilicated in places. Confluent on

chest and arms now. On legs opaque, but still umbilicated. Skin red and swollen between eruption. Face swollen. Bowels open. Eating and sleeping better.

October 11th.—Temperature 100·6° F. (m.); 102° F. (e.) Pulse 108, fair. Eruption pustular everywhere. Throat sore still. Takes food fairly. Thirsty. Not sleeping.

October 12th.—Temperature 100·4° F. (m.); 101·4° F. (e.) Eruption on face beginning to scab over in places, still pustular, confluent, and rounded on top in most places. Throat better. Pulse 108.

October 13th.—Temperature 100·2° F. (m.) and (e.) Eruption unchanged. Conjunctivæ injected. Takes food and sleeps better. Pulse 110, good.

October 14th.—Temperature 100° F. (m.); 100·8° F. (e.) Pulse 96. Eruption on face scabbing all over. Few scabs beginning to separate. Eruption on hands scabbing, on arms, chest, and legs still pustular, rounded and confluent, well marked areola around pustules. Slept badly. Takes food fairly.

October 15th.—Temperature 99·4° F. (m.); 99·4° F. (e.) Eruption scabbing now on arms, chest, and legs in places, but still mostly pustular and rounded. Pulse strong, sleeping better.

October 16th.—Temperature 101·8° F. (m.); 102·4° F. (e.) Eruption scabbed on face, chest, and arms, still few pustules on legs, but even here they are drying up. Scabs separating from face. Areola around pustules on legs is very dark. Tongue cleaner. Bowels open. Takes food well. Slept badly.

October 17th.—Temperature 100·2° F. (m.); 101·2° F. (e.) Scabs are separating on face, chest, and hands. Has few pustules still on legs, but even here a few crusts are separating.

October 18th.—Temperature 98·4° F. (m.); 100·6° F. (e.) Doing well.

October 19th.—Temperature 99·6° F. (m.); 101·2° F. (e.) Eruption scabbed everywhere, scabs separating still. Left conjunctivæ red and injected; purulent discharge from left eye.

October 20th.—Temperature 100·2° F. (m.); 100·4° F. (e.) Has some pitting where scabs have separated.

October 22nd.—Temperature 99° F. (m.); 100° F. (e.) Scabs still falling, leaving pits behind them.

October 24th.—Temperature 100° F. (m.); 100·2° F. (e.) Marked pitting on face and hands. Characteristic odour now leaving the body.

October 26th.—Has small abscess in left eyelid.

October 28th.—Temperature normal in mornings. Has few scabs to separate. To have a bath.

October 31st.—Gets up. Felt very weak and had to go to bed again. Temperature 101·2° F. (e.)

November 1st.—Temperature normal night and morning. Scabs all separated. Is now convalescent.

November 4th.—Has a large boil on left leg. Has pain in right side. Friction sound heard on auscultation over painful spot.

November 5th.—Temperature 99·8° F. (m.); 101·2° F. (e.) Has pain still in right side, friction sound still audible.

November 6th.—Pain easier, friction less audible.

November 8th.—Much better, friction not to be heard.

November 29th.—Discharged, cured.

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*Case 22.—Discrete Smallpox.*

(22.) JAMES MILLIGAN, aged 33 years, Seaman.

Admitted October 4th, 1887. Vaccinated when a child. Has one mark on his left arm. Comes from barque *Lanoma*.

Taken ill on October 1st, felt tired and languid, shivered, headache, no general pains, no pain in back or stomach; vomited on October 2nd. On September 28th, he also felt tired, and on the two following days could not eat, but managed to work about. Did not lie up till October 1st. The eruption appeared on October 3rd on the temples, in the form of red pimples. He also noticed a few red pimples over his abdomen, to which his attention was drawn by reason of their itchiness; sweating profusely; pulse 105°, soft; tongue thickly coated in centre, red at edges; bowels open after aperients.

October 5th.—Temperature normal night and morning; eruption still papular, scattered, shotty, fairly profuse on face, legs, and feet; very few papules on the body, skin red around papules; takes food, sleeps well. Has numerous scars on arms, probably from old ecthyma.

October 6th.—Temperature, 98·4° F. (m.); 99·8° F. (e.) Papules are getting vesicular on face and arms, as also on chest; not umbilicated except in very few instances; papules more plentiful on legs, but discrete.

October 7th.—Temperature, 98·4° F. (m.); 101·2° F. (e.) Eruption on face semi-confluent, contents of vesicles are opaque, few umbilicated, but mostly rounded on top. On arms vesicles are discrete, not so opaque as on face, umbilicated; vesicles few in number on body. On the legs about the ankles vesicles are profuse and semi-confluent, getting opaque; sleeping badly, otherwise doing well.

October 8th.—Temperature, 98·6° F. (m.); 100·4° F. (e.) Eruption pustular everywhere. Doing well.

October 9th.—Temperature, 98·8° F. (m.); 99·6° F. (e.) Eruption on face beginning to dry up.

October 10th.—Temperature normal. Eruption drying up, except about the ankles, where it is pustular and rounded on top.

October 11th.—Temperature, 98·8° F. (e.) Scabs separating on face, hands, and legs; still pustular on ankles; scabs are small, and light yellow in colour.

October 12th.—Scabs separating, leaving small pits and coloured tubercles; scabbing round ankles now.

October 13th.—Up and about ward. Scabs still falling.

October 22nd.—All scabs off, leaving a few indistinct pits.

October 24th.—Put in convalescent tents.

November 11th.—Discharged, cured.

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*Case 23.—Discrete Smallpox.*

(23.) MARGARET BISHOP, aged 49 years, Housewife.

Admitted September 27th, 1887.

Was vaccinated when 15 years old. Has one good mark on left arm.

Became ill on September 10th, and had to take to bed. Was ailing on September 9th, but was able to get about; came on like a cold, pains all over body, especially in back and right side, shivering, loss of appetite, thirst, vomiting of greenish bitter vomit, constipation, frontal headache, sleeplessness, felt feverish. Eruption appeared on September 15th, first on face as small red pimples, then on arms, hands, and feet respectively, and very few on body. Did not notice eruption become vesicular, but states that it was filled with matter on September 18th and 19th. Only noticed one pustule depressed in centre on face. Within the next two or three days they began to dry up and scab over, especially on the face. Scales began to separate on September 25th, when she got up for first time. Scales mostly separated on admission on September 27th. There was a red areola round the pustules; they never ran together. She improved in health when the eruption came out. Had no secondary fever. Had visited Mrs. Branchflower when she was ill. On admission was convalescent; she had then a few red discoloured patches and pimples mostly on the face, a few scattered on other parts of body. Put in convalescent tent on October 2nd.

October 24th.—Discharged, cured.

*Case 24.—Hæmorrhagic and Confluent Smallpox.*

(24.) EDWIN HODGES, aged 43 years, Commission Agent.

Admitted 9th October, 1887. Vaccinated when a child. Three good marks on left arm. Acted as male nurse to Male Smallpox Hospital from October 9th to date of beginning of illness. Had visited Mr. Storrer on October 6th. Taken ill on October 19th. Went to bed on that date. Got wet through after arrival at Hospital, and caught cold. Complained of severe headache and pain in back; vomiting of curdled milk; no shivering; loss of appetite; thirst; bowels open; sleeplessness; is light-headed. Has had bad cough for last 10 days. Has suffered from phthisis for some years. Eyes felt sore. Conjunctivæ injected. Eruption appeared on October 20th on front of both wrists in form of red papules. On the evening of same day it appeared on the face in same form. Temperature, 103·4° F. in evening.

October 22nd.—Temperature, 102·2° F. (m.); 102° F. (e.) Eruption spreading up arms and over face, less raised than yesterday. Has few purpuric spots on body and legs. Tongue whitish, coated. Takes very little food. Bowels open, slept fairly. Cough very troublesome. Expectoration frothy, mucoid. Has headache still. Has dulness over base of either lung with numerous râles and rhonchi, rhonchi over chest anteriorly.

October 23rd.—Temperature, 102·8° F. (m.); 102·6° F. (e.) Pulse 96, soft. Respirations 36, no vomiting. Tongue thickly coated. Bowels open. Has severe cough with muco-purulent sputa. Not sleeping. Has eruption all over body, slightly more raised, no sign of vesicles yet. Skin on face very red and irritable. Very despondent.

October 24th.—Temperature, 102·6° F. (m.); 102·6° F. (e.) Pulse 108, soft and compressible, not taking food well. Thirsty. Coughing very much, expectoration profuse, whitish. Headache. Physical signs in chest unchanged. Eruption getting hæmorrhagic, slightly vesicular on face and arms, areola purpuric, vesicles about ankles are umbilicated. Slept well after draught.

October 25th.—Temperature, 101·4° F. (m.); 100·2° F. (e.) Eruption vesicular and umbilicated about ankles, contents hæmorrhagic. On the face the vesicles are hæmorrhagic, contents of vesicles being absorbed and skin flattening down, eyes bloodshot. Eruption on arms and body purpuric, slightly raised into vesicles. Tongue moist, coated, swollen. Throat sore and swollen. Difficulty in breathing and swallowing, gurgling in the trachea, cough troublesome, expectoration frothy, blood-stained, like prune juice. Bleeding from mouth. Bowels open. Motions contain blood. Slept badly. Pulse 114. Very weak. 8 P.M., very low. Cough very severe. Still spitting blood. Sinking.

October 26th.—Gradually sank and died at 1·30 A.M.

*Case 25.—Confluent Smallpox.*

(25.) ELIZABETH AGNES ———, aged 26 years, Housewife.

Admitted 11th October, 1887.—Was vaccinated when a child. Has three small marks on left arm. Took to bed on October 21st, but had felt ill about a week before this. Had pain in back; frontal and vertical headache; shivering; pain in the limbs; languor. Vomited on October 21st and 22nd, vomit consisted of partly digested food. Thirsty; loss of appetite; constipation; insomnia. Eruption appeared on October 23rd on the face and forehead, in form of red papules; in evening of same day a few papules appeared on arms, hands, and chest; papules are shotty under the finger; no papules at present on legs. Tongue red at edges, coated in centre. Bowels well after aperients; is light-headed. Pulse, 132. Temperature, 104·2° F., on October 23rd. Shifted into Female Smallpox Hospital this day, October 23rd.

October 24th.—Temperature, 102·6° F. (m.); 102·4° F. (e.) Eruption thicker on face, arms, and back. Only few papules on chest and legs, still shotty to feel. Has one or two vesicles around mouth and on wrists. Pulse, 84, good. Tongue coated, red at edges. Takes food; bowels open; slept fairly; light-headed; thirsty.

October 25th.—Temperature, 98·4° F. (m.); 99·8° F. (e.) Eruption now vesicular on face, arms, and back; umbilicated around mouth and nose; vesicular and slightly umbilicated on chest; skin of face red and swollen; copious eruption on back, scanty on legs. Very dull and stupid; delirious from 4 A.M. Did not sleep. Tongue red and dry; sordes on lips and teeth. Not taking food. Bowels open. Pupils dilated. Pulse 96, soft. Left breast hard and swollen, has been suckling a child; milk drawn off.

8 P.M.—Still very dull and stupid; semi-unconscious; refuses food and medicine; has to be fed by enemata; not passed any urine for 24 hours; catheter passed and no urine drawn off, as bladder is empty.

October 26th.—Temperature, 98·8° F. (m.); 100·6° F. (e.) Pulse 120, soft; pupils dilated; has sordes on lips and teeth; tongue covered with eruption, red and irritable; takes more food; not retaining enemata now; has now passed some urine; eruption confluent on face, arms, and back; still vesicular and umbilicated; skin between red; has few vesicles on chest, belly, and legs, which are umbilicated. More sensible and will do as told now; was very drowsy all night; left breast hard and swollen.

8 P.M.—Has improved wonderfully; has passed urine in good quantity during the day; breast easier, less swollen; much more sensible; taking some food now; bowels not open.

October 27th.—Temperature, 99·8° F. (m.); 101·4° F. (e.) Tongue dry and glazed; takes food fairly well; bowels open; throat sore; passes plenty urine now; slept badly; delirious; pulse 132, fair. Answers questions rationally now. Has slight cough. Eruption on face pustular; getting rounded-on top; skin red and swollen; cannot open her eyes for swelling of lids. On the hands the eruption is still vesicular, contents getting opaque, some umbilicated, others acuminate; eruption getting thicker on legs, and becoming larger and pustular.

October 28th.—Temperature, 99·6° F. (m.); 100·4° F. (e.) Pulse 120, fair; tongue still dry; takes food fairly; passes plenty urine; sleeps fairly; eruption on face pustular, rounded and confluent; skin between red and swollen; on hands and arms opaque, umbilicated and confluent with red areola round pustules; on chest pustular, discrete and rounded; on legs getting opaque, umbilicated and scattered, with red areola around.

October 29th.—Temperature, 98·6° F. (m.); 99° F. (e.) Pulse 132; takes food; bowels not open; slept well; quite sensible now; eruption beginning to scab about forehead and nose where it has been scratched, pustular and rounded on rest of face; on rest of body the eruption is now pustular; discrete on chest, but confluent elsewhere.

October 30th.—Temperature, 99° F. (m.); 100° F. (e.) Tongue less dry; sleeps and eats better; no delirium now. Face less swollen and scabbing over; on hands and forearm scabbing beginning at centres of pustules; still pustular and rounded on chest and legs.

October 31st.—Temperature, 98·6° F. (m.); 99° F. (e.) Pulse 108. Has not passed any urine through the night; left breast again hard and painful; eruption on face, hands, arms, and chest all scabbed over.

November 1st.—Temperature 98·4° F. (m.); 99·6° F. (e.) Breast less indurated, easier; sleeping and eating well.

November 2nd.—Temperature, 98·4° F. (m.); 99·8° F. (e.) Tongue getting moister; bowels open; passing plenty urine; pulse 84, soft. Scabs separating on face, leaving well-marked pits; separating also on arms, chest, and back; legs still scabbing over; left breast soft again.

November 3rd.—Temperature normal, morning and evening. Pulse 110. Scabs separating everywhere; face clean, except on forehead, much pitted on face.

November 4th.—Convalescent now; scabs still separating now.

November 8th.—Scabs all separated. A crop of fine branny scales have appeared in place of the scabs, but are easily washed off.

Shifted into convalescent tents.

December 5th.—Discharged, cured.

#### *Case 26—Hæmorrhagic and Confluent Smallpox.*

[(26.) HARRIET WARD, aged 21 years Domestic Servant.

Admitted October 26th, 1887.—Comes from Mr. Mills, who is at present ill with discrete smallpox. Was vaccinated on October 15th, 1887. Has four large scabs on right arm over seat of vaccination. Taken ill first on Sunday, October 23rd; had great pain in her back, and frontal headache; had rigors, loss of appetite, thirst, vomiting for last three days; vomit is frothy and dark in colour; bowels open; general pains all through body; sleeplessness. Has had cough for last three weeks, with frothy, yellowish sputa; has sore throat, and pain on swallowing; tongue coated; has eruption on tongue, palate, and throat; has nausea, breath very foul. Pulse, 108, fair. Temperature, 103·4° F. Skin acting, respiration quickened. First noticed the eruption to-day (October 26th) on face and hands in the form of red pimples; pimples are shotty under finger; has few papules also on body and legs; skin between eruption red. Has dulness over bases of lungs, with râles and rhonchi on auscultation, rhonchi over lungs anteriorly.

October 27th.—Temperature, 101·8° F. (m.); 104·2° F. (e.) Tongue red and coated; mouth and throat covered with eruption. Takes food, bowels open, sleeps badly; pain in back less. Conjunctivæ injected. Pulse, 120, soft. Eruption on face papular, but has a few vesicles around the mouth; skin of face red and swollen, eyelids swollen. Eruption getting vesicular on arms, with small red areola round vesicles; eruption thicker on chest and arms, but still for most part papular and shotty. Still coughing very much; expectoration mucoid. Throat still sore.

October 28th.—Temperature, 104·4° F. (m.); 103·6° F. (e.) Takes food fairly; tongue red; bowels open; is menstruating, flow very profuse. Throat sore; has dysphagia; conjunctivæ injected; delirious, slept badly; frequent cough, with blood-stained sputa. Has few râles over bases of lungs, rhonchi over chest anteriorly; eruption around mouth vesicular and umbilicated; skin between eruption red and swollen; eruption on rest of face more raised, not distinctly vesicular, but running together; on hands and arms confluent and vesicular, and umbilicated in parts; on legs has scattered purpuric patches.

October 29th.—Temperature, 102·6° F. (m.); 102° F. (e.) Pulse, 108, weak. Tongue dryish; has eruption on tongue and throat. Takes food fairly; bowels open; menstrual flow less profuse. Coughing still; expectoration frothy and prune-juicy; sleeps badly, delirious; eruption flattening down on face again; vesicles more marked around mouth and umbilicated, as also on hands; eyelids much swollen. On

legs eruption is becoming purpuric-like ; has sordes on lips and teeth. 8 P.M.—Coughing more ; eruption blood-stained on legs.

October 30th.—Temperature, 101.2° (m.) . Pulse irregular, very small ; tongue dry ; bleeding from mouth and throat ; not taking food ; takes brandy well ; bowels not open to-day ; very delirious, did not sleep. Conjunctivæ bloodshot : eruption on face irregular, umbilicated about mouth and nose, flattened down on rest of face ; confluent, purpuric on forehead ; on arms eruption is purpuric and umbilicated ; about the knees eruption is vesicular and filled with blood ; is very low ; continually coughing ; expectoration consists of bright red blood and frothy mucus. 3 P.M.—Bleeding profusely from mouth and throat, also losing blood per vaginam. 8 P.M.—Still bleeding, very low, evidently sinking.

October 31st.—Died 2.15 A.M.

*Case 27.—Hæmorrhagic and Confluent Smallpox.*

(27.) JOHN WILKINSON, aged 36 years.

Admitted October 12th, 1887.

Does not remember being vaccinated ; has no marks. Was vaccinated on October 16th in Hospital, and took in two places.

Taken ill on the evening of October 26th ; then complained of headache, and was isolated at once. Next day (27th) he had lumbar pain, loss of appetite, thirst ; vomited on 28th and 29th ; has nausea ; no rigors. Eruption appeared on evening of October 28th on the forehead in the form of a few red spots ; also few red spots on the wrists.

Temperature, 103.4° F. on evening of October 28th. Was put in male smallpox hospital, October 28th.

October 29th.—Temperature, 103.4° (m.) ; 104.2° F. (e.). Pulse fair ; tongue red and irritable ; bowels well open ; has nausea ; did not sleep ; has red papular eruption on forehead, more plentiful than yesterday ; has few scattered red papules on arms, chest, abdomen, and legs, shotty to feel.

October 30th.—Temperature, 101.6° F. (m.) ; 101.8° F. (e.). Pulse 96 ; has short, tickling cough ; tongue still red ; vomited last night ; takes food fairly ; bowels open ; slept fairly ; eruption on face getting vesicular, but vesicles are flattened on top and dark in colour ; confluent ; on arms eruption is still papular and red, as also on chest, where eruption is thicker ; on legs still papular and shotty, more raised than elsewhere.

October 31st.—Temperature, 100° F. (m.) ; 100.2° F. (e.). Pulse 108, soft ; tongue still irritable ; vomiting still ; vomit consists of altered food ; takes food ; bowels open ; slept badly ; has sore throat ; mouth and throat, also tongue, covered with eruption ; eruption on face confluent, more raised, vesicular, and umbilicated in places ; has same characters on arms and legs ; more scattered on chest than elsewhere ; skin swollen ; has cough.

November 1st.—Temperature, 99.6° F. (m.) ; 99.6° F. (e.). Pulse 96, fair ; tongue red, throat sore ; has dysphagia ; not eating well ; bowels open ; very deaf ; delirious ; sleeping badly ; getting out of bed and putting on his clothes ; eruption on forehead opaque and rounded ; on rest of face still vesicular, umbilicated, and confluent ; contents of vesicles dark in colour ; on chest and arms vesicular, confluent, more elevated, umbilicated : skin red and swollen ; on legs, eruption more profuse, vesicular and umbilicated ; has slight cough.

November 2nd.—Temperature, 100° F. (m.) ; 101.8° F. (e.). Pulse 120, not so strong ; tongue moist and red ; throat not so sore ; swallows better ; takes food and sleeps badly ; bowels not open ; very delirious ; keeps getting out of bed ; constantly muttering and picking at the bedclothes ; eruption on forehead flattening on top, and opaque ; eyelids and skin swollen ; eruption on hands and arms vesicular, umbilicated, and well raised ; skin between vesicles dark in colour ; on legs the eruption is now vesicular, confluent, umbilicated, and blood-stained ; coughs less ; seems inclined to doze now.

November 3rd.—Temperature, 99.8° F. (m.) ; 101.6° F. (e.). Pulse 120, irregular in force ; tongue dry in centre, moist at edges ; has eruption on tongue and throat ; throat sore, feels dry ; glands in neck enlarged ; takes liquid food ; bowels open ; slept four hours during night ; eruption on face pustular, flattened down on top ; on chest, arms, and legs vesicular, confluent, umbilicated, and containing blood ; face much swollen, nose stuffed with discharge ; has cough, with purulent sputa ; has muttering delirium and *subsultus tendinum*.

November 4th.—Temperature, 101.4° F. (m.) ; 102.8° F. (e.). Pulse 132, soft and irregular ; respiration noisy ; breath foul ; foul odour from body ; has cough still, with muco-purulent sputa ; tongue dry ; takes very little food ; bowels open ; slept fairly ; still has muttering delirium and *subsultus tendinum* ; eruption on face pustular and flattened on top ; face and eyelids much swollen still ; on chest, back, and arms eruption is pustular, confluent, flattened down in places, and umbilicated in places still more deeply coloured with blood ; on legs vesicles are dark, skin purpuric in places.

November 4th, 8 P.M.—Very low, refuses all food, very delirious, breathing laborious.

November 5th.—Temperature, 100.8° F. (m.) ; 102° F. (e.) . Respirations 36, noisy ; not coughing now. Pulse 132, irregular. Tongue dry, and covered with sordes. Takes food better, bowels not open ; slept fairly till 1 A.M., muttering delirium still, getting out of bed, constantly picking at bed clothes. Eruption beginning to scab on face. Has scratched his face. On chest pustules are running together, are rather flat on top, some few are rounded. On legs and thighs pustules are confluent ; contents of pustules dark. Skin between dark and purpuric.

November 6th.—Temperature, 102.8° F. Pulse thready, soft. Cannot protrude tongue ; not taking food ; respirations 60, noisy. Very low, evidently dying. Eruption hæmorrhagic all over body ; skin purpuric.

Died 10.30 A.M., November 6th.

*Case 28.—Discrete Smallpox.*

(28.) GEORGE SPEERS, aged 10 years.

Admitted September 27th, 1887. Vaccinated when 3 months old. Has 4 good marks on left arm. Comes from Bryant's cottages. His sister, Emily Speers, died of smallpox.

Taken ill September 30th. Had shivering, bilious vomiting, drowsiness, coated tongue, loss of appetite, thirst, pains all over his body, and headache. Has been lying about for last two days, and not playing. On the evening of September 30th some red papules appeared on his face; he was then shifted into Smallpox Hospital.

October 1st.—Temperature, 98·6° F. (m.); 99° F. (e.) Has few papules on arms, body, and legs now, which are shotty under the fingers; those on the face are inclined to be vesicular. Still drowsy, thirsty, has loss of appetite.

October 2nd.—Temperature, 98·4° F. (m.); 99° F. (e.) Eruption on face more vesicular, and becoming so on body and limbs; not more profuse. No symptoms. Very mild attack.

October 3rd.—Temperature, 98·4° F. (m.); 99·4° F. (e.) Improving.

October 4th.—Temperature, 98·4° F. (m.); 99·8° F. (e.) Vesicles on face drying up; distinctly vesicular, but not umbilicated on body and limbs.

October 5th.—Temperature normal. Vesicles on body and limbs drying up without becoming pustular. Scales of golden colour separated from face. No pitting.

October 6th.—Scales falling still. No pitting.

October 8th.—All scales separated. Put into convalescent tents.

November 1st.—Discharged, cured.

**GENERAL OUTLINES OF TREATMENT.***General Management and Treatment.*

All were strictly confined to the wards, which were freely ventilated, with as little draught as could be managed. Their linen was frequently changed, and subjected to the action of a disinfectant solution of chloride of lime (2 ozs. to the gallon of water) prior to boiling. In the mild cases, and in the early stages of the disease, the treatment consisted of a low diet, much similar to the Launceston Hospital spoon diet, with cooling drinks (for which following formula was principally used:—

Rj. Potass Tart. Acid ..... gr. 80  
Succi Limonum.  
Sacchari Albi. .... aa. ʒj.  
Aquæ Bullientis ..... ad. Oj.

Solve—

along with fruits, principally bananas and oranges.

Later on the diet was more nourishing and stimulating, being composed principally of eggs, milk, beef tea, soups, and jellies. Stimulants were given according to the necessities of the individual case. In all low or adynamic cases, especially where there was much pustulation, considerable support by means of nutritious food and stimulants was given.

*Drug Treatment.*

In mild cases, and in the early stages, a saline diaphoretic mixture composed as follows was given:—

Rj. Potass Nitrat..... grxv.  
Liq. Ammon. Acetat..... ʒiii.  
Spt. Ether Nitrosi ..... ʒp.  
Aq. Camphoræ..... ad. ʒj.  
3aa. hora.

In the later stages, especially when accompanied by much suppuration, a mixture of chlorate of potash and cinchona, or one composed of carbonate of ammon. and cinchona, or of quinine, was given, and in the more severe cases, diffusible stimulants in form of following mixture were given:—

Rj. Spt. Ammon. Aromat..... ʒp.  
Spt. Ether. Sulph. .... m xx.  
Spt. Camphoræ ..... m xx.  
Aquæ ..... ad. ʒj.  
3aa. hora.

along with brandy and wine.

In the malignant and hæmorrhagic no treatment appeared to be of any use. Here stimulants were freely given with turpentine, dilute sulphuric acid, and ergot.

*Symptomatic Treatment.*

Hyper-pyrexia was treated by quinine, in gr. v. doses every 3 hours till the temperature fell.

Diarrhœa was treated by restricting the diet to milk and lime-water, with chalk and opium powder, in gr. xx. doses, or with a mixture composed of bismuth, glycerine, tincture of opium, and water, or the following:—

Rj. Acid Sulph. Aromat..... m x.  
Tinct. Opii. .... m v.  
Tinct. Cardam. Co. .... ʒp.  
Syr. Zingiber ..... ʒj.  
Aquæ. .... ad. ʒj.  
3aa. hora.



Vomiting was treated with bismuth mixture, and restriction of the diet for a time. This was not a troublesome symptom. Sleeplessness was the most troublesome symptom to contend with, especially in the more severe cases, where they were pulmonary complications. Bromide of potash and chloral hydrate were the drugs chiefly used, occasionally morphia was given hypo-dermically.

Delirium was treated by stimulation, and sedative draughts of bromide of potash and chloral hydrate. In the case of children warm baths were of great service. In some cases the patients had to be restrained, but this was avoided as much as possible, as the convalescent patients acted as special watches.

Sore throat and mouth were relieved by gargles of glycerine and borax, and by sucking chlorate of potash lozenges.

Conjunctivitis required no special treatment—drops of alum and wine of opium, with fomentations across the eyes, and exclusion of light.

Retention of urine was treated by the use of the catheter.

Pulmonary complications were treated on general grounds, free use of stimulants and expectorants, as carbonate of ammonia, senega, and squills, with wine of ipecac.

#### *Treatment of the Eruption.*

The skin was sponged by means of a piece of lint or flannel, with some antiseptic solution, principally Condyl's fluid or carbolic acid.

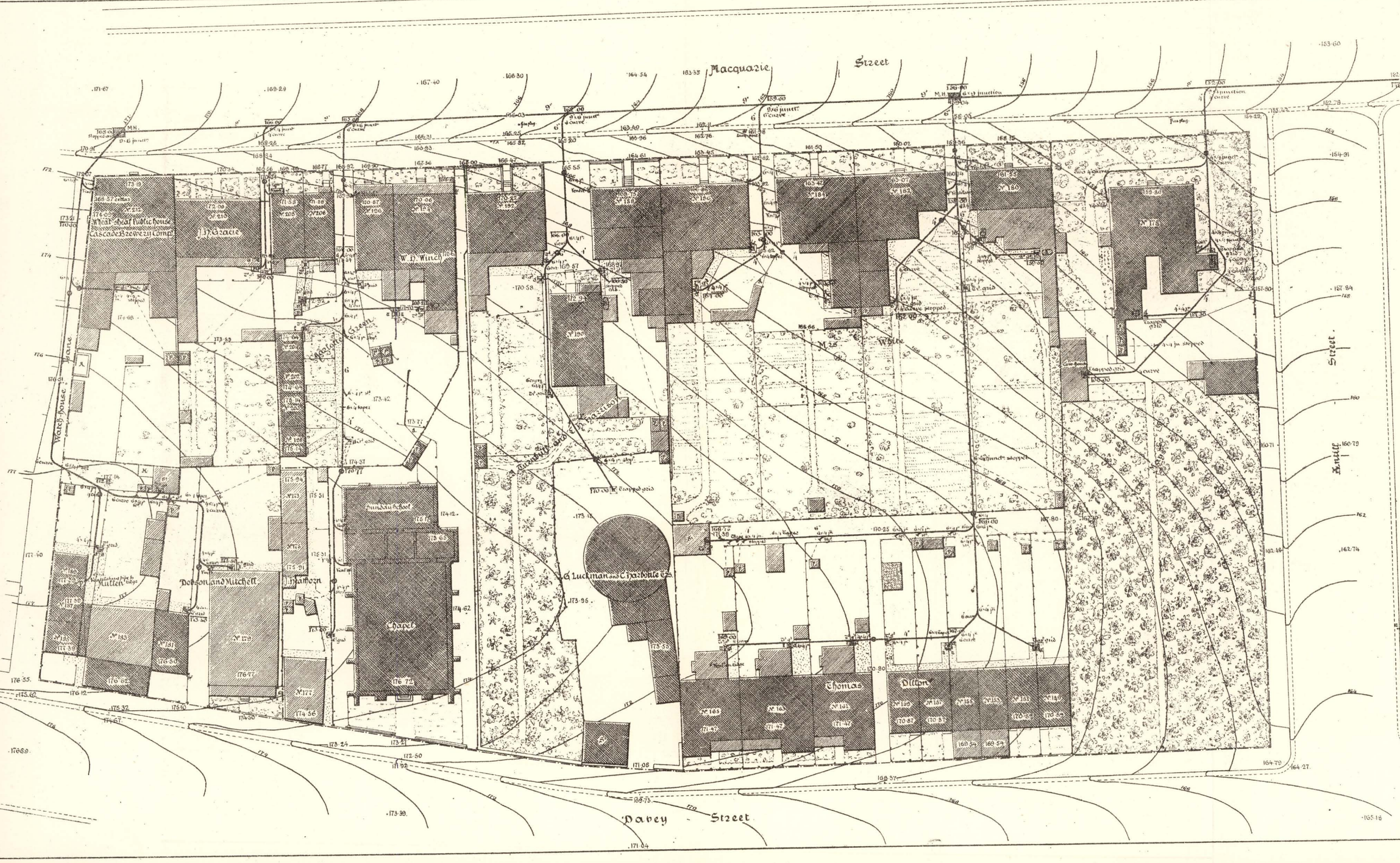
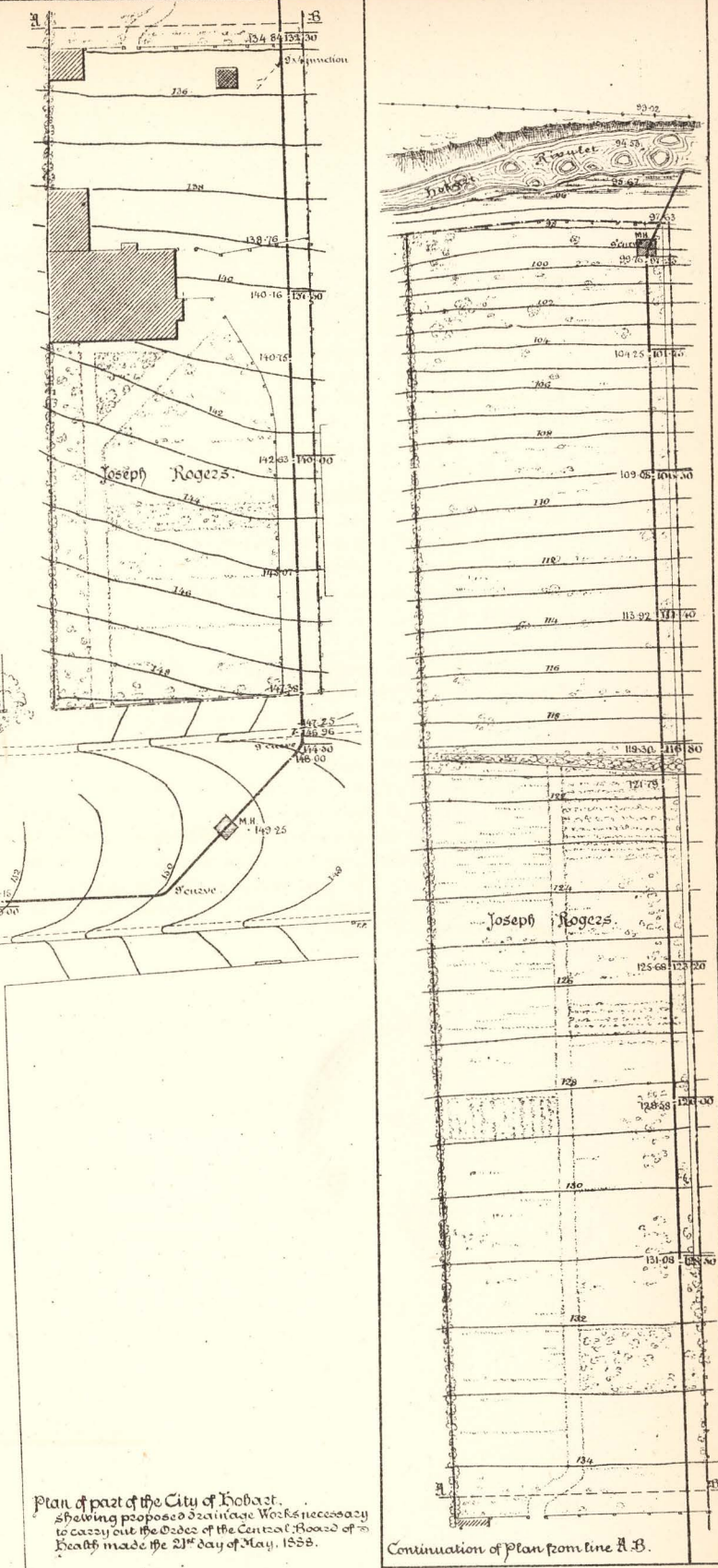
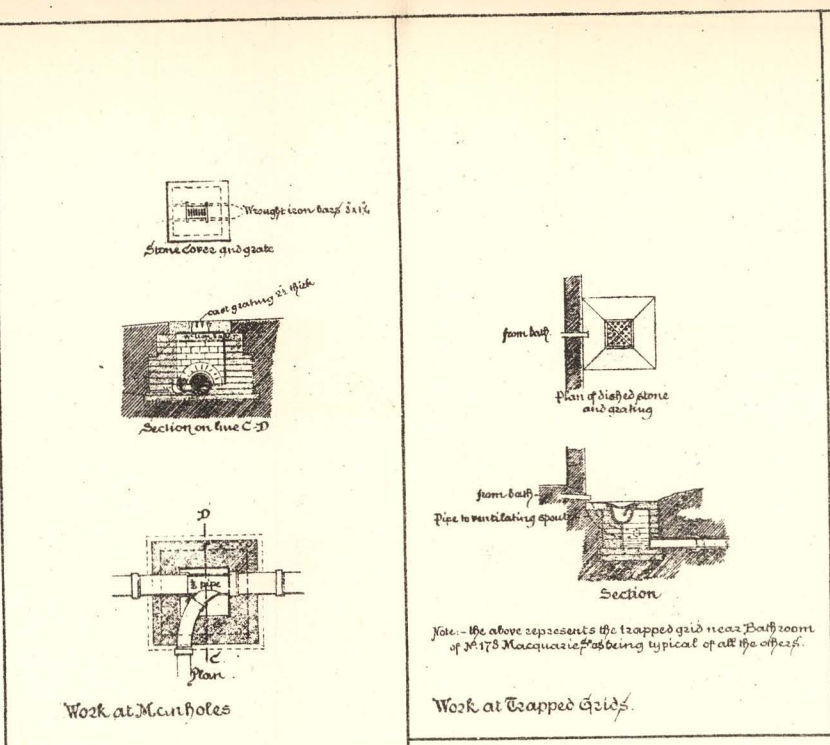
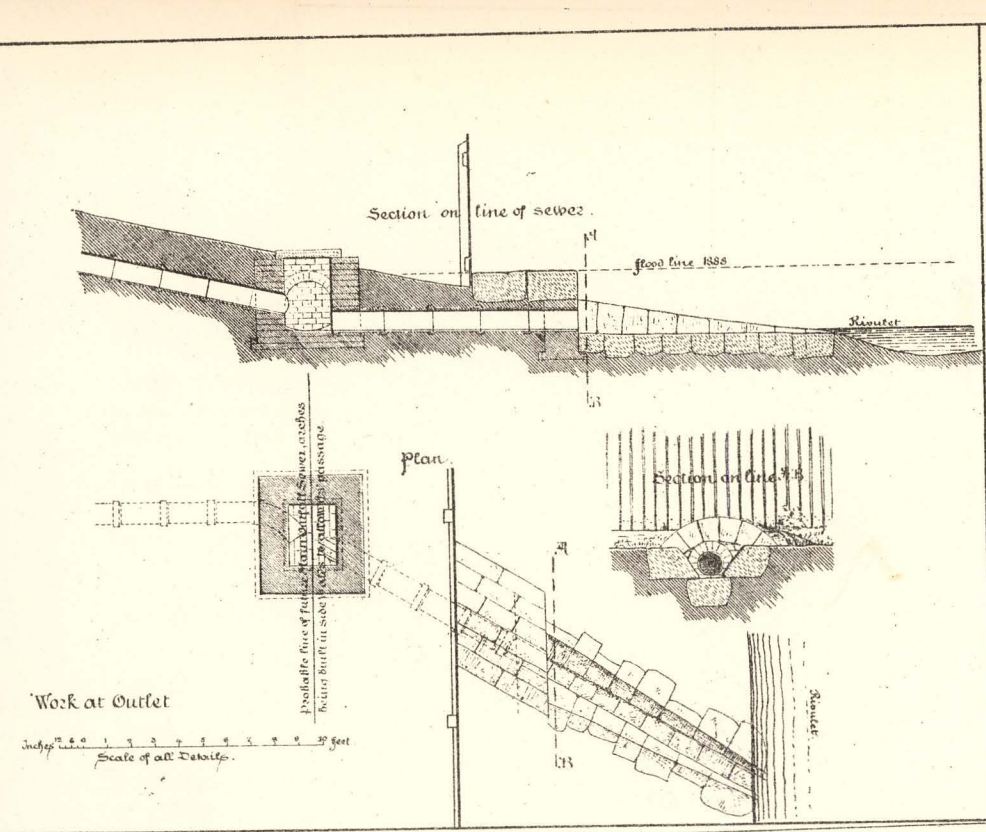
Carron oil was applied freely over exposed parts, being either smeared over them or applied on lint. This seemed to relieve the irritation better than anything, and the patients in most cases asked for it after having once used it.

Flexile collodion was used in some cases, but was not beneficial in preventing pitting or relieving irritation. It was necessary in some cases to muffle the hand with cotton wool to prevent the patients from scratching themselves. In mild cases nothing was done for the eruption. In some cases where there was much discharge with the eruption, a dusting powder of starch and oxide of zinc was used to absorb secretion. The hair was cut in most cases.

During convalescence, good diet—fish, meat, &c.—was allowed, ferruginous tonics, wine, and warm carbolic baths.

JAS. M. PARDEY, *M.B., B.S.*





Plan of part of the City of Hobart, showing proposed sewer lines and manholes, to carry out the Order of the Council, passed on the 21st day of May, 1888.

Continuation of Plan from line A-B.

Scale 1" = 100 feet

Note: -

The existing features of the locality are shown as follows: -

- Black or stone buildings -
- Walls -
- Cuts and paved gutters -
- Grades for drainage -
- Pavement marked P -
- Downpipes that may be used as ventilators -
- Levels are indicated as follows: -
- Specific height of point of ground marked on plan in feet and decimals above M. T. S. datum, the height of lowest ground floor of houses above the same datum are marked on each house, thus 12.50.
- Approximate contours level lines of the surface for every foot in height above the same datum, thus 12.50.
- The names of the owners of property are taken from the Assessment Roll, and the apparent boundaries of each property are marked thus: -

The proposed works are shown as follows: -

- Lines of pipe sewers - the larger numbered figures giving the interior diameters in inches
- Manholes - the figures giving the interior diameters of main and branch pipes
- Branch pipes - the figures giving the interior diameters
- Cover pipes - the figures giving the interior diameters of each end
- Pipes to ventilate down spaces -
- Manholes for inspection -
- Provision for future extension of drains is made by stopper ends and junctions, and the line of prolongation shown thus: -
- Decimals of feet under a line, thus 12.50, show the height in feet above M. T. S. datum of the waterway of the drain at the place where they occur.

Legend:

- Wooden buildings -
- Walls -
- Water-tanks -
- Barriers -
- Asphalts are marked A

Signature: A. M. M. 26/2/89