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Contributors

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REPORT

ON THE

SANITARY ADMINISTRATION

OF THE

PUNJAB

FOR THE YEAR 1881.



Lahore:

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ERRATA.

- Page 14—line 4 ; for *was* read *were*.
" 26— " 16 ; for *of* read *off*.
" " " 17 ; *volumes* read *volume*.
" " " 18 ; *was* read *runs*.
" " " 22 ; *of man* read *of a man*.
" " " 38 ; for *were* read *was*.
" 29— " 19 ; for *favorable* read *favorably*.
" " " 52 ; *foot* read *feet*.
" 34— " 10 ; for *mile* read *miles*.
" 45— " 32 ; for *in sanitary* read *insanitary*.
" 84— " 35 ; *Delhi*, for *monoply* read *monopoly*.
" 93— " 10 ; *Gujránwála*, for *drain-* read *drainage*.
" 99— " 3 ; for *need not to* read *need not*.
" 103— " 1 ; below statement, for *188 villages* read *96 villages*.
" 106— " 21 ; *Eminabad town (g.)*, for *water-coarases* read *water-courses*.
- Appendix C. Page iv—line 8 ; for *ever* read *rarer*.





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TABLE OF CONTENTS.

REVIEW OF THE REPORT OF GOVERNMENT.

SECTION I.—METEOROLOGY.

NIL.

SECTION II.—EUROPEAN ARMY.

NIL.

SECTION III.—NATIVE ARMY.

NIL.

SECTION IV.—JAILS.

NIL.

SECTION V.—GENERAL POPULATION AND VITAL STATISTICS.

Para.	Page.
1 General results of birth registration	2
2 Births by Quarters	"
3 Birth-rate amongst the urban and rural populations	"
4 District birth-rate	"
5 Do. do. analysed	"
6 General results of death registration	3
7 The mortality from chief diseases during the year 1881 compared with the whole series of years since 1868	"
8 The general results of the analysis of the above table	4
9 Provincial death-rate	"
10 The urban and the rural death-rate	"
11 Mortality by months	5
12 District death-rate	"
13 Analysis of the district death-rate	"
14 The district death-rate for 1881 compared with that for previous years	"
15 Deaths by Ages	6
16 Births compared with deaths	"
17 Birth registration in large municipal towns	7
18 Death do. do.	9
19 Results of registration in selected villages on the Western Jamna Canal	"
20 Births and deaths registered amongst the European and Eurasian population	13
21 Amount of fines realized for neglect in registering births and deaths	14

SECTION VI.—CHIEF DISEASES OF THE YEAR.

A.—CHOLERA.

22 Monthly mortality from cholera during 1881	15
23 The remarks of the Army Sanitary Commission that the three earlier months of each year are nearly exempt from cholera fully borne out by subjoined statement showing monthly mortality from cholera from 1867 to 1881	"
24 The localities affected by cholera during 1881, <i>vide</i> Cholera map	"
25 The Special Cholera Committee appointed under the orders of the Government of India	"
26 Statement showing the mortality from cholera and the record of principal atmospheric changes in the Punjab during 1880 and 1881	17
27 Statement showing mortality from cholera in the several districts of the Province	18
28 Particulars of the first cases of cholera registered during the first four months of the year	"
29 Outbreak of cholera in the village of Khundin, Pergannah Pinjore in the Native State of Pattiāla, on 4th May—the first intimation received	19



Para.		Page.
30	Appearance of cholera in the Delhi district before the outbreak in the Native State of Pattiāla	20
31	History of the outbreak in the Delhi district	"
32	Ditto ditto district of Lahore	21
33	Ditto ditto Lahore Central Jail	24
34	Ditto ditto Kangrá district	26
35	Ditto ditto Hoshiárpur do.	27
36	Ditto ditto Umballa do.	30
37	Ditto ditto Jullundur do.	32
38	Ditto ditto Jhelum do.	36
39	Ditto ditto Gujránwála do.	37
..	The sudden death of Colonel F. J. Millar	38
40	History of outbreak in the Ferozepore district	"
41	Ditto ditto Amritsar do.	39
42	Ditto ditto Gujrat do.	41
43	Ditto ditto Karnal do.	42
44	Ditto ditto Gurdaspur do.	44
45	Ditto ditto Ludhiána do.	46
46	Ditto ditto Siálkot do.	47
47	Ditto ditto Rawalpindi do.	53

B.—SMALL-POX.

48	Deaths registered from small-pox by years since 1868	54
49	Small-pox deaths according to ages	"
50	Seasonal fatality of small-pox by years since 1868	"
51	Small-pox chart	55
52	Fatality of small-pox epidemics by districts since 1868	"
53	Small-pox deaths in 1881 by districts	58
54	Necessity of vaccination pointed out	"
55	The importance of the co-operation of the Civil and Medical Officers to promote the cause of vaccination	"

C.—FEVERS.

56	The facts disclosed by the fever, rainfall and food-charts given in last year's report	59
57	The charts and statements referred to, reproduced for comparison with the statistics for the year under review	"
58	Statement of aggregate rainfall and fever mortality by months, and the price of principal food-grains by years	"
59	Statement of deaths and rainfall by quarters, and rate of food-grains by years in the several districts	61
60	Fever mortality in Amritsar city, suburbs, and district	"
61	The fatality of fever epidemic in the city of Amritsar	62
62	Causes of do. do.	"
63	Effects of canal irrigation without proper drainage	"
64	The Municipal authorities advised to take necessary precautionary measures before the epidemic actually broke out	63
65	Reference to Doctor Bennett's report on the fever epidemic in the city	"
66	Opinion of Doctor Ross on the relation between fever and cholera	64
67	Measures of treatment, &c., adopted by local authorities	"
68	The epidemic during the year under review contrasted with previous epidemics in their relation to rainfall	"
69	A pure water-supply for the city urgently needed	"
70	Fevers in Lahore city	"

D.—BOWEL COMPLAINTS.

Para.		Page.
71	Deaths from bowel complaints by years	66
72	Ditto ditto by months during 1880, 1881	"
73	Ditto ditto by districts	"
74	Death-rate from bowel complaints in towns	"

E.—INJURIES.

75	Deaths from suicide	"
76	Ditto wounding	67
77	Accidental deaths	"
78	Deaths from snake-bite	"
79	Ditto hydrophobia	68
80	Mortality caused by wild beasts	"
81	Deaths from all other causes including those from chest diseases	"

SECTION VII.—VACCINATION.

82	Orders of Government on the working of the re-organized vaccine scheme	69
83	Special Vaccine Establishment sanctioned for Deputy Sanitary Commissioners	74
84	The delay in starting work in certain districts to what due	"
85	Compilation of vaccine returns changed from official to calendar year	75
86	Statements Nos. I and II show vaccinations performed by Provincial and Dispensary Vaccinators	"
87	The aggregate number of operations performed by the late Provincial Establishment during six months	"
88	Strength of Provincial Staff	"
89	Vaccination work performed in districts by Provincial Establishment	"
90	Native States	76
91	Establishment of Superintendent	77
92	Dispensary Vaccination	"
93	Vaccination performed in Eastern Circle by Deputy Sanitary Commissioner's Special Staff	"
94	By the Special Staff in the Western Circle	"
95	Vaccination performed in district from October to December 1881	"
96	The aggregate number of operations performed during the 9 months ending 31st December 1881	"
97	Method of operation	78
98	The arm to arm method explained	"
99	Statement No. V showing the vaccinations performed since 1867 to year under review	"
100	Information regarding cost of vaccination department not available	"

SECTION VIII.

NIL.

SECTION IX.—SANITARY WORKS—CIVIL.

101	Water-supply and drainage schemes	80
"	Delhi water-works	"
"	Ludhiána drainage and water-supply schemes	"
"	Lahore water-works	"
"	Simla ditto	81
"	Kohát water-supply scheme	"
102	Municipal Income and Expenditure Statement	"
103	Sanitary improvements effected during the year in the several districts of the Province	84
"	Delhi	"
"	Gurgaon	85

Para.		Page.
103	Karnál	86
"	Hissar	"
"	Rohtak	87
"	Sirsa	88
"	Umballa	"
"	Ludhiána	"
"	Simla	"
"	Jullundur	89
"	Hoshiárpur	"
"	Kángra	90
"	Amritsar	91
"	Gurdáspur	"
"	Siálkot	92
"	Lahore	"
"	Gujránwála	93
"	Ferozepore	"
"	Rawalpindi	"
"	Jhelum	94
"	Gujrat	"
"	Shahpur	"
"	Mooltan	95
"	Jhang	"
"	Montgomery	"
"	Muzaffargarh	"
"	Dera Ismail Khan	96
"	Dera Gházi Khan	"
"	Bannu	"
"	Pesháwar	"
"	Hazára	97
"	Kohát	"

SECTION X.—GENERAL REMARKS AND PERSONAL PROCEEDINGS.

104	Notice of officers	98
105	Dr. Cuningham's Sanitary Primer	"
106	Suggestions made in the memorandum of the Army Sanitary Commission in the Punjab Sanitary Report for 1879	"
107	Rules for the guidance of Deputy Sanitary Commissioners and Civil Surgeons	99
108	Further suggestions for improvement of village conservancy	101
109	List of towns and villages inspected by Deputy Sanitary Commissioners and Civil Surgeons,	"

ACTION TAKEN BY MUNICIPAL AND DISTRICT COMMITTEES ON THE SUGGESTIONS MADE IN THE FOLLOWING INSPECTION REPORTS PRINTED IN THE SANITARY REPORT FOR THE YEAR 1880.

109	Srigovindpur town (Gurdáspur district)	103
"	Batala " (" ")	"
"	Bahrapur " (" ")	104
"	Dinanagar " (" ")	"
"	Kalka " (Simla ")	"
"	Siálkot "	105
"	Fatehgarh " (Gurdáspur district)	"
"	Kalanaur " (" ")	"
"	Eminabad " (Gujránwála ")	106
"	Batala village (" ")	"



Para.		Page
109	Jalalpur town (Gujrat district)...	106
"	Dingah " (" ")...	"
"	Mangowal village (" ")...	107
"	Matawala, Chak Vasawa, Sahidwali, Dulawala, Chachi and Mung villages (Gujrat district),	"
"	Ahmadpur town and Shorkot village (Jhang district)	"
"	Athara Hazári village (" ")	"
"	Muzaffargarh town	"
"	Kohát "	108

SUMMARY OF INSPECTION REPORTS INSPECTED BY THE DEPUTY SANITARY COMMISSIONERS OF THE EASTERN AND WESTERN CIRCLES, PUNJAB.

(By the Deputy Sanitary Commissioner, Eastern Circle.)

109	Siálkot town	108
"	Dera Nanak town (Gurdáspur district)...	109
"	Kalanaur " (" ")...	110
"	Mokerian " (Hoshiárpur ")...	111
"	Dasuya " (" ")...	112

(By the Deputy Sanitary Commissioner, Western Circle.)

"	Hussan-Abdal village (Rawalpindi district)	114
---	---	-----

SUMMARY OF INSPECTION REPORTS RECEIVED FROM CIVIL SURGEONS UP TO END OF DECEMBER 1881.

109	Nuh town (Gurgaon district)...	114
"	Ghasera village (" ")...	115
"	Sirsa town (Sirsa ")...	"
"	Fazilka " (" ")...	116
"	Shahabad town (Umballa ")...	117
"	Bungah " (Jullundur ")...	118
"	Phillour " (" ")...	119
"	Tarn Taran " (Amritsar ")...	"
"	Pope Naka village (Gujranwála ")...	120
"	Kamoki " (" ")...	121
"	Moralliwala " (" ")...	"
"	Ghakhar town (" ")...	122
"	Eminabad " (" ")...	"
"	Ramnaggar " (" ")...	123
"	Lala Musa village (Gujrat ")...	124
"	Kunjah town (" ")...	"
"	Jalalpur " (" ")...	125
"	Dingah " (" ")...	126
"	Nurpur village (Shahpur ")...	"
"	Shujabad town (Mooltan ")...	127
"	Lan village (Jhang ")...	128
"	Vasu and Astana villages (Jhang ")...	"
"	Mirak village (" ")...	129
"	Shorkot town (" ")...	130
110	Names of officials and non-officials whose services in the cause of Vaccination and Sanitation are brought to the notice of Government	131

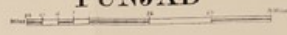
APPENDIX A.

Lawrence Military Asylum, Sanáwar	i
" Memorial " Murree	iv

STATE OF NEW YORK
IN SENATE
January 15, 1891.

No.	NAME	RESIDENCE	COUNTY	SCHOOL DISTRICT	SCHOOL	TEACHER	SCHOOL
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CHOLERA MAP FOR 1881 PUNJAB



A F G H I J K L M N O P Q R S T U V W X Y Z

NORTH WEST PROVINCES

Statement appended to map illustrating the distribution, &c., of Cholera in the Punjab during the year 1881.

Province	Sub-Province	District	Number of Cases	Number of Deaths	Number of Recoveries	Number of Persons Attacked	Number of Persons who Died	Number of Persons who Recovered	Number of Persons who were Attacked and Died	Number of Persons who were Attacked and Recovered
Punjab	North West Provinces	Rawalpindi	100	50	50	100	50	50	50	50
		... (many more rows with similar data) ...								

1.—The Geographical position of the several roads indicated is shown by numbers from 1 to 474.
 2.—The Isolated Spots show the mortality from cholera per 1,000 of population.
 3.—The Isolated Spots in red ink indicate the date of the first case in each spot.

READ—

Report by Deputy Surgeon-General BELLEW, C. S. I., Sanitary Commissioner, Punjab, on the Sanitary Administration of the Province for the year 1881.

IN the Statements appended to the Report, the ratios of births and deaths have been calculated on the figures of the census of 1868, but the Sanitary Commissioner furnishes a table at page 15 in which the figures of the census of 1881 have been adopted.

2. The results of the registration of births in 1881 indicate great improvement, when compared with the results of the previous year. The highest rate, 49 per mille, is returned from the districts of Delhi and Lahore; the lowest rate, 19 per mille, from Peshawar. The registration of births is generally inefficient in the frontier districts, but even in them there are indications of improvement. If these districts and Simla (the circumstances of which are peculiar) are excluded, Kangra is the only district that yielded a birth rate below 36 per mille. The rates of seven districts ranged between 36 and 39 per mille, while the remaining seventeen districts yielded rates ranging between 40 and 49 per mille. The mean birth rate of the year was 40 per mille, against 31 per mille, the rate of the previous year.

3. This increase in the birth rate was not, however, solely the result of improved registration. Doctor Bellew points out that the increase apparent in the rates of 1881 of several districts when compared with the rates of the preceding year was due to the low rates of 1880, which were the natural consequence of the impaired health of the people in 1878 and 1879. There can be no doubt that the birth rate in this country is affected by the variations that occur in the health and condition of the people, and it is to these variations in the birth rate, as well as in the rate of mortality, that certain anomalies apparent in the statements of the recent census which give the number of persons living at different ages, are due.

4. The death rate of the Province for the year, 30 per mille, is considerably in excess of the rate for the previous year, which was 27 per mille. The number of deaths registered in 1881 was 519,779, or 47,048 in excess of the number registered in the previous year. This excess of mortality occurred in the last four months of the year. Up to the end of August the number of deaths registered was less by 1,200 than the number registered up to the corresponding date of 1880; but in September the mortality rose greatly; and in the period comprising that and the following 3 months, upwards of 60,000 deaths were registered in excess of the number registered in the corresponding period of 1880.

5. The districts shewing the highest death rates were,—Amritsar 51 per mille, and Lahore 41 per mille. The death rates of the municipal towns were, as usual, much higher than the rates of the rural circles. The mean death rate of the 52 municipal towns was 29 per mille. The death rate of the town of Amritsar was 125 per mille, that of Lahore 56, of Delhi 48, and of Peshawar 42 per mille.

6. Of the total number of deaths registered in the Province, 28 per cent. were of infants under one year of age, and 46 per cent. under 6 years of age. The calculations at the bottom of Statement IV of the vital statistics series do not furnish the information required, which is the *death rate* at different periods of life. The materials for producing this information are now available, and will, no doubt, be utilized in future reports.

7. The death rates of the two sexes were 29 per mille for males and 30 per mille for females. The rate of mortality was higher among females than among males, which is unusual; in the statistics of former years the reverse

has been the case. In the population according to the census of 1881, the sexes are in the proportion of 117·4 males to every 100 females; in 1881, males were born in the proportion of 116 to every 100 females born; and males died in the proportion of 116 to every 100 deaths of females.

8. Births were registered in excess of deaths in all districts with the exception of Peshawar and Simla, the total increment to the population of the Province for the year being 175,987. It seems desirable that the increment of the population, as shown by the excess of births over deaths, should be added annually to the census figures of the several districts and large towns.

9. The following figures show the mortality from the more common diseases during the year compared with the mortality from the same diseases in the preceding year:—

	1880	1881
Cholera	274	5,207
Small-pox	9,145	6,749
Fevers	327,727	355,279
Bowel complaints	20,736	17,281
Injuries	5,557	5,695
Other causes	109,292	129,568
TOTAL	472,731	519,779

10. The Sanitary Commissioner, in the section of his Report devoted to the cholera epidemic of 1881, publishes *in extenso* the reports furnished by the Medical officers of the several districts visited by the epidemic; and in many of these a clear and interesting account is given of the origin and progress of the epidemic in the districts or towns to which they severally relate. The descriptions of the epidemic in the town and district of Sialkot, and in the towns of Batala and Umballa, which were written by Assistant-Surgeons Futteh Singh, Bhagwan Dass and Duni Chund, reflect great credit on these officers, and afford satisfactory evidence that men with their education and professional training are capable of affording very valuable assistance in the prosecution of sanitary enquiries.

11. To each of these reports by the Medical officers Dr. Bellew has prefixed a figured statement showing the diffusion of the epidemic chronologically and locally over the several districts. From these statements it appears that cholera became epidemic in Delhi early in May, it attacked Lahore early in June, and at the same time an epidemic outbreak occurred in the Kangra district. It subsequently visited many other districts, but its prevalence was confined in a very marked degree to the Sadr or other important municipal towns in each district. From Statement No. VI of the series of vital statistics appended to the Report it appears that of the total number of 5,207 deaths from cholera in the Province, 3,693 occurred in the municipal towns, equal to 2·84 per mille of the aggregate population, while in the rural circles only 1,512 deaths were registered, equal to 0·09 per mille of the rural population. Of the towns of the Province 54 per cent, or more than one half, were visited by cholera, but of the villages of the Province not more than one per cent were visited by cholera; even in the district of Lahore, over which the epidemic was most widely diffused, deaths from cholera were reported from not more than 7 per cent of the villages.

12. Turning again to the chronological statements prefixed to the district reports, it may be observed that almost invariably the first place in a district in which cholera became epidemic was the central town. In the Delhi district the first epidemic outbreak occurred in a village close to the Grand Trunk Road, but the disease appeared almost simultaneously in the suburbs of the city. In the Rawalpindi district the first epidemic outbreak apparent in the statements occurred in a village near Attock, but with these exceptions it was the central or most important town in each district that was first attacked; in most instances it was the Sadr towns; in the districts of Lahore, Amritsar, Sialkot, Jullundur, Hoshiarpur and Umballa no epidemic outbreak occurred in

any other locality before the disease had become epidemic in the Sadr town. A similar relation is also observable in more than one chronological statement between the smaller municipal towns and the villages surrounding them. The statement of the Jullundur district affords the most complete example of this relation ; but in the statement of the Lahore district it may be observed, with reference to the Kasur circle, that, although cholera became epidemic first in the small town of Khem Karn, no outbreak occurred in any of the surrounding villages until after the disease had become epidemic in the important town which forms the centre of the circle.

13. It appears also that the disease became widely epidemic only in those districts in which it prevailed severely in the central town. Cholera prevailed as an epidemic in the city of Delhi and its suburbs only during the latter part of May and the first part of June. The total number of deaths amounted to 78 only. With this small degree of prevalence in this large centre of population the diffusion of the epidemic over the surrounding districts was very limited. In Lahore and its suburbs, on the other hand, cholera prevailed as an epidemic from the beginning of June to the end of September, and the number of deaths recorded amounted to upwards of 1,100 ; and with this severe and prolonged epidemic prevalence in the central town there was wide diffusion over the surrounding country. In Jullundur and Hoshiarpur also, with a high degree of prevalence in the central town, we find considerable diffusion over the district. In the district of Ludhiana, the Sadr town of which suffered but little from cholera, and in Ferozepore, where the town escaped altogether, the number of villages attacked was very small.

14. The facts to which attention has now been drawn indicate a very considerable degree of dependence of the rural population as regards cholera on the Sadr and municipal towns, and the chief practical lesson to be derived from the study of the epidemic of 1881 is the very great importance of maintaining the central towns in good sanitary condition ; it is clear that the benefit of sanitary measures is not only reaped by the inhabitants of the towns in which they are carried out, but that the inhabitants of the surrounding villages participate in it.

15. The greater liability of the population of the large towns to be attacked by cholera is not apparently due to any habit of body, induced by the aggregation of large numbers of human beings in one locality, or any other insanitary condition specially connected with large towns, which is not equally liable to occur in small towns or villages ; for experience shews that isolated villages, though cholera may reach them later, are apt to suffer terribly from it, when it does attack them. The highest rates of mortality from cholera among the urban population occurred in the towns of Lahore, Hoshiarpur and Jullundur, where they ranged from 8 to 12 per mille ; but these rates were exceeded manifold in many villages, of which the following are examples :—

District.	Village.	Population.	Deaths from Cholera.	Ratio per mille.
Delhi ...	Takurpur ...	300	30	100
Lahore ...	Gulviral ...	184	15	81
Do. ...	Mahomedipur ...	463	25	54
Sialkot ...	Tahu ...	164	11	67
Amritsar ...	Thattah ...	440	16	36
Do. ...	Kot Sed Mahomed ...	1,136	29	25
Umballa ...	Konjpur ..	340	19	56
Do. ...	Sigrat ...	1,367	34	25
TOTAL. ...	...	4,394	175	40

16. From these examples it is evident that the insanitary condition which renders persons liable to suffer from cholera is apt to occur in a more intense form and to involve a larger proportion of the population in small villages than in the large towns. If the precise nature of this condition could be ascertained, the necessary measures for its removal might possibly be found to be not difficult of application, and it should be the chief aim of cholera investigation to discover what this special condition is ; but in the absence of definite information as to its nature, we may hope, by carrying out those sanitary measures which are known to be antagonistic to the prevalence of disease, by insuring cleanliness of the soil by strict conservancy in preserving the water-supply from pollution, and by improving the drainage of localities where such improvements are called for, to mitigate its virulence ; and there is satisfactory evidence that measures of this kind, more especially the introduction of a pure water-supply, have greatly mitigated the prevalence of cholera wherever they have been thoroughly applied.

17. The application of such measures to the vast number of villages, scattered over the country, is altogether beyond the power of the State, and the Government is obliged to confine its efforts to the central and municipal towns ; but the knowledge that such measures, applied to a Sadr or Municipal town, may in a season when cholera is prevalent not only ensure the safety of the town itself, but may at the same time confer immunity on the surrounding district, affords the greatest encouragement to perseverance in every effort to improve the sanitary condition of the towns. At the same time it may be hoped that better results in the way of sanitation of small towns and villages may be obtained in future in connection with the scheme for the extension of local self-government now under consideration.

18. The section of the Report in which the statistics of small-pox are discussed contains a statement of much value shewing the mortality from this disease in each month of the 14 years from 1868 to 1881 inclusive. The close relation that exists between the prevalence of small-pox and season comes out very clearly in this statement ; with one exception the epidemic every year reached its highest point of prevalence in the month of May, then, declining through the following four months, the point of minimum prevalence was almost with equal regularity reached in the month of October. In the month of November the prevalence again increases, and if the increase in this month is great it marks the commencement of a severe epidemic ; in fact, the character of the following season as regards small-pox appears to be determined in the month of November or October, or even earlier.

19. It is satisfactory to observe that in 1881, the year under review, the mortality from small-pox was very much less than in any previous year of the series. This diminution may, no doubt, be in a great measure attributed to the effect of vaccination ; but, as the Sanitary Commissioner points out, low mortality from small-pox for one or two years does not afford much ground for confidence that the enemy has been overcome : it is in fact the natural consequence of previous years of excessive prevalence, and perhaps also it is due to some extent to the absence of favorable climatic conditions. It is more than probable that when sufficient time has elapsed the mortality will again rise. The statement, however, affords sufficient evidence that vaccination has effected as much good as could be fairly expected, from the limited extent to which operations have hitherto been carried on. Taking the whole series of 14 years, the number of deaths from small-pox in the last seven years was 50,000, or one-fourth less than in the first seven years.

20. The revised scheme for the amalgamation of the Vaccination with the Sanitary department came into operation in October last. Under this scheme the provincial Vaccination establishment by which operations were formerly carried on was broken up, and from it, with some considerable additions, district establishments have been formed and placed under the immediate superintendence and control of the Civil Surgeons, subject to inspection by the special officers of the Sanitary department ; and it is hoped that under this system the district

authorities will more earnestly co-operate in extending the benefits of aaccination among the people.

21. Under the new system the returns will exhibit operations for the calendar instead of for the official year, as formerly; and as moreover some time was unavoidably lost in bringing the new scheme into operation, the work of the year under review cannot with any advantage be compared with the work of former years; but from information received it would appear that the district authorities have everywhere cordially adopted the new plan of operations, and that it promises to work well.

22. The number of vaccinations performed in the course of the nine months ending the 31st December 1881 amounted to 280,046, of which 265,411, or 94 per cent, were successful.

23. In the section devoted to the subject of fevers Dr. Bellew gives additional statistics to those contained in the report for the previous year, bearing on the relation between rainfall and the prevalence of fevers, and he claims that those statistics prove conclusively that the above relation is very close; that heavy monsoons are invariably followed by destructive epidemics of these diseases; while, on the other hand, there is remarkable immunity from them when the monsoon season is dry; that the rainfall is invariably excessive every third year; and that in those same third years the fever epidemics also attained their maximum fatality. The truth of the general proposition that there is a close relation between rainfall of the monsoon and the prevalence of fever in the latter half of the year may be acknowledged, and also that the prevalence of fever is comparatively slight when the rainfall of the monsoon is scanty, and severe when the rainfall is excessive; but the remaining propositions that an excessive rainfall invariably recurs triennially and that in these same third years the epidemic fevers attain their maximum fatality, cannot be accepted without considerable reserve. The statistics, as tabulated below, do not at any rate admit of their being stated in such positive terms:—

YEAR.	Aggregate Rainfall from June to September inclusive.	Deaths from fever August to December.	Price of wheat, seers for a Rupee.
1868	382	68,000	19
1869	659	191,000	14
1870	664	157,000	16
1871	642	97,000	22
1872	799	169,000	20
1873	631	122,000	22
1874	669	97,000	24
1875	954	160,000	25
1876	636	253,000	25
1877	302	92,000	24
1878	675	297,000	15
1879	649	272,000	13
1880	576	156,000	14
1881	647	198,000	17
Average	635 inches	166,000	

Any conclusions, however, drawn from massing the averages of rainfall in all the districts of the Province, and comparing such aggregate with the total mortality from fever, must be manifestly fallacious. The variation in the rainfall of the Punjab is not so much in the quantity given to the whole Province as in its distribution. It does not often happen that the aggregate rainfall is very much in excess of the average. It occurred only twice in the fourteen years shown in the above table, but it not unfrequently happens that a monsoon rainfall not much above the average in the aggregate is distributed very abnormally, an excessive quantity being poured on some localities, while on

others the fall is deficient ; it is, therefore, scarcely to be expected that any very definite or constant correspondence will be found to exist between the aggregate rainfall and the aggregate fever mortality of the Province ; and if we follow the enquiry further and compare the rainfall and fever mortality within the more limited areas of districts, we do not find even here that the mortality is with any constancy in direct proportion to the quantity of the rainfall.

24. The following table exhibits the rainfall and mortality of the seasons of 1880 and 1881 in seven districts of the Province :—

DISTRICTS.			Rainfall 2nd and 3rd Quarters.		Fever mortality 3rd and 4th Quarters.
Amritsar	1880	...	18.3	...	8.812
	1881	...	68.5	...	23.306
Lahore	1880	...	7.9	...	9.125
	1881	...	18.2	...	14.374
Gujranwala	1880	...	10.1	...	6.320
	1881	...	23.3	...	5.381
Umballa	1880	...	35.6	...	11.317
	1881	...	20.6	..	15.116
Ludhiana	1880	...	35.6	...	6.546
	1881	...	20.6	...	7.801
Jullundur	1880	...	32.9	...	7.960
	1881	...	26.6	...	9.026
Mooltan	1880	...	3.9	...	3.934
	1881	...	2.5	...	4.906

25. In Amritsar, where the area of a large city was swamped by an extraordinary rainfall for which the drainage of the locality was quite inadequate, the increase of mortality from fever was enormous. In Lahore also, with a greatly increased rainfall compared with the previous year, there was a large increase in the mortality from fever ; but in the adjoining district of Gujranwala, with a greater increase in the rainfall, there was a considerable decrease in the fever mortality. This difference in the effect of increased rainfall in these two districts may be, in some measure, due to the circumstance mentioned by the Sanitary Commissioner that the water level has been considerably raised over a large portion of the Lahore district by canal irrigation ; but east of Amritsar the rainfall over a large tract of country, comprising the districts of Jullundur, Ludhiana and Umballa, was in 1881 greatly deficient as compared with the previous year ; yet in all these districts the statistics shew a greatly increased mortality from fever. The district of Mooltan affords another illustration of the same kind : notwithstanding that its rainfall in 1881 was considerably below its very small average, the fever mortality was very much greater than it had been in any one of the previous 4 years, and there were very few districts of the Province in which the ratio of mortality from fever in 1881 was higher.

26. It will be evident from the above comparative statements that quantity is not the sole factor in the relation between rainfall and fever, and that other circumstances, besides difference in the quantity of rainfall, have to be taken into account in investigating the cause of the great variations in the prevalence of fever in this Province. The monsoons vary not only in the quantity of rain they bring, but in the dates on which they set in and cease, and the steadiness with which the rains continue. They may commence early

in June or not until July and continue till late in September; they may be heavy in July and August and then cease, and it is possible that these variations may greatly influence the prevalence of fever. Moreover, the fever mortality occurs chiefly in the months of September and October after the rains have ceased, and though it may be in a great degree dependent on the quantity of rain that has previously fallen, the temperature and other climatic conditions of those months cannot be well left out of account.

27. In 1881 the rains almost ceased in the end of August. In Amritsar there was no rain between the 31st August and 20th September, and it is noteworthy that although the heavy fall of rain which swamped the locality occurred on the 10th of July, the health of the population was reported "excellent" up to the middle of August, and there was no marked increase in the mortality from fever till the first week in September; after that it increased very rapidly and reached its maximum in the 1st week of October, when it again declined.

28. Doctor Bennett's clear and full report on this violent epidemic having been already reviewed, it will be sufficient here to mention the conclusions arrived at. The fever was malarial in its origin and caused by an excessive and unusual rainfall in a locality the natural drainage of which is very imperfect; but the type of fever appears in many cases to have been rendered more fatal by the insanitary conditions under which the population of a large Native city exists, *viz.*, crowded dwellings, imperfect conservancy and contaminated water-supply. The mortality occurred chiefly among the poorest classes, and nearly half of the deaths were of children under five years of age, and of these again more than two-fifths were infants under one year of age. The excessive mortality among these classes was in a large measure due to the extreme difficulty of providing food suitable in sickness for a large mass of people suddenly prostrated by fever, and not only unable to provide food for themselves and their families, but also without the power to cook it when provided. This difficulty was met so far as was practicable by the establishment of soup-kitchens in various parts of the city where large numbers were fed daily. Dispensaries were also established in convenient places for the distribution of medicine, and arrangements were made for treating at their homes those who were too sick to attend at the dispensaries. The number of patients who received medicines and treatment during the four months that the epidemic prevailed, amounted to Rs. 2,04,000. The number of deaths in the city from fever alone, during the four months September to December, amounted to 10,121, or at the rate of 210 *per mille* per annum. The actual death rate of the city for 1881 from all causes was 125 *per mille*.

29. Measures have been taken for remedying the defects of drainage and conservancy which have been brought to light in the course of the investigation into this deplorable mortality. Schemes for draining the country surrounding Amritsar, for the better conservancy of the city, and for improving the water-supply are now under the consideration of His Honor the Lieutenant-Governor, and will shortly be carried into effect.

30. Under the head of sanitary works the only important event recorded in the Report is the completion of the works for the water-supply of Lahore, which were opened on the 30th June 1881. Notwithstanding the failure of the Service Reservoir, a constant supply has been kept up to the whole of the city and suburbs with the exception of certain localities at a high elevation. The people at first entertained a great prejudice against the water, but this is disappearing, and the demand is gradually increasing. The water is undoubtedly of excellent quality, and measures have been taken to convince the people of this. The householders have not as yet shewn much disposition to lay on the new water to their houses, and the Municipal Engineer attributes this to the water rates being too high. It is certainly desirable that the richer inhabitants should be encouraged to bring the water into their houses; for at present *bhishties* employed by them take possession of the

stand-posts to the exclusion of the poorer classes. The suggestion of the Engineer that the wells, the water of which is known to be impure, should now be closed, is worthy of consideration.

31. With the exception of this completion of the water-works at Lahore, not much advance was made during the year towards effecting radical improvement in the water-supply of the central towns of the Province. The plans and estimates for the Delhi water-works, however, have been completed, and in Ludhiana special measures have been taken to prevent the water-supply from pollution both in the town and district. In Rawalpindi it is intended that the scheme for supplying the town with pure water, which was commenced in 1880, shall be proceeded with.

32. At Peshawar a considerable sum has been spent on the construction in the city of masonry channels for sewage and for drinking water, comprising a central channel for drinking water with one on either side for sewage, the latter being on a lower level than the former. Apparently all these channels are open, and the water, before it reaches the channel in the city, passes close to the Sadr Bazar of the cantonment and other public places in an open stream. The channels no doubt constitute a great improvement on the state of things which previously existed in the city of Peshawar, but it cannot be allowed that they ensure the water-supply from dangerous pollution.

33. In many places much has been done in the way of cleansing wells and protecting the mouths with masonry platforms. The utility of cleaning wells periodically and protecting them from direct pollution is unquestionable; there appears, however, to be some idea that if a well has been cleansed out and its mouth protected, the water it contains may be regarded as pure and safe. In more than one of the inspection reports appended to this Report, the water of a town has been pronounced good, because it has been found clear and sweet to the taste; it seems therefore desirable to draw the attention of Civil Surgeons to the valuable remarks of the Chemical Examiner contained in his Report for 1879 on the water-supply of the towns and villages of the Punjab, the simple means by which they may be examined, and the sanitary significance of the several impurities found in them. Wells sunk within a town or even in its immediate vicinity are a most unsafe source of supply, and the fact of water from a well being clear and sweet is not a guarantee of its being pure. The report of the Deputy Sanitary Commissioner of the Eastern Circle on the condition of the town of Sialkot (page 108) affords a good illustration of this. The water of three wells was examined, two being situated at some distance outside, the third inside the town; no trace of sewage contamination was found in the water of either of the wells situated outside, but the water of the well inside the town, which was highly spoken of by the inhabitants as pure and sweet, and much used by Hindus, contained sewage salts in great abundance.

34. Important improvements in drainage and conservancy have been effected in many places. In Delhi the old Shahjahaní drains were opened up and thoroughly cleaned out; and the Conservancy Department which was reorganized in 1879 has proved very successful, with the result that the city is now pronounced by all to be very clean and healthy. At Lahore the drainage works of the city are reported to be progressing satisfactorily, and when completed will leave little to be desired in respect of thorough conservancy.

35. At Amritsar the main drainage scheme is nearly completed round the eastern side of the city, and the internal drainage has been improved by the adjustment of the street drains with the outer main drain. The subject of the drainage of the whole locality with a view of obviating the swamping and water-logging of the soil which resulted from the heavy rainfall of last year has been taken up and surveys have been made, but it is encompassed with great difficulties. It is proposed to construct a light tramway round the east and west of the city for the purpose of rapidly removing daily the sewage from the city to the extra mural depôts.

36. In the district of Hoshiarpur three important drainage schemes have been carried into execution.

37. In Jullundur the work of cutting off the spills from the *jhils* north of the town and conducting them into the East Beyn nullah has been completed, and the measure is said to have proved very successful; but it would appear from the Civil Surgeon's report on the severe outbreak of cholera which occurred in Jullundur in 1881, that some more comprehensive scheme for the improvement of the drainage of the locality is urgently wanted; he reports "that the site is most unfortunate in respect of its drainage: only two years ago great efforts were made to improve the sanitation of the place, and wells have been made with the sole purpose of sluicing the drains, but unfortunately there is no main sewer to carry off the diluted sewage, which accumulates in large excavations immediately outside the city on its western side. In the rains the lower level of the site causes regurgitation of the sewage into the city along the sewers and the rise in the water-level in the wells at the same time."

38. The Deputy Commissioner of Simla "regrets that he is unable to report that any conservancy scheme embracing the main bazar or the whole station of Simla has been put in hand, but the prospect of a complete project being sanctioned and commenced is more hopeful than it was twelve months ago. The large number of buildings being erected for public offices and residences for the Government Establishments makes the need of a complete system of conservancy every day more urgent."

39. The numerous inspection reports by the Deputy Sanitary Commissioners and the Civil Surgeons brought together in the Sanitary Report under review afford ample evidence that sanitary improvement is engaging the earnest attention of the district authorities, and a fair share of the funds at their disposal is devoted to it. In nearly all the central towns a supply of pure water brought from beyond the inhabited area is much wanted, and in not a few there is urgent need for comprehensive schemes of drainage. For works of this kind larger funds than are within the compass of local bodies are needed, but the importance of placing the central towns in a thoroughly healthy state is so great, with reference to the general health and well-being of the Province, that it may be hoped some means of raising funds for the purpose may be found.

40. Considerable numbers of villages were inspected during the year, and the inspectors describe grave insanitary evils in the way of close lanes and alleys, ill-ventilated dwellings, absence of conservancy, and courses of water-supply exposed to pollution; but it is scarcely within the power of Government to enforce reforms in these matters in places remote from constant supervision. These insanitary conditions are closely connected with the habits of the people, and no general reform in these habits can be looked for until the people are convinced of the evils resulting from them; it is, however, satisfactory to note that efforts are being made to diffuse better knowledge on these points among the people, and to awaken them to the fact that it is within their own power to prevent much of the sickness from which they now suffer. Doctor Cunningham's Sanitary Primer has been widely distributed and has been introduced as a text-book in a large number of schools. Under the recent orders of Government the Civil Surgeons will be brought more into contact with the people in the supervision of vaccination, in sanitary inspections of towns and villages, and in the scrutiny of the registers of births and deaths; and they have been directed while engaged in the performance of their duties to use their best efforts to persuade the inhabitants of villages to abandon practices which tend to produce unhealthiness, and explain to them the evil consequences of neglected conservancy, unprotected water-supply and other insanitary conditions with which they habitually surround themselves. As the people are now to be entrusted in a large degree with the management of their own affairs, and will have more voice in the expenditure of local funds, the importance of more widely extending their knowledge in matters that affect the public health cannot be too strongly insisted on.

41. * The Report contains a large store of valuable information on the causes of diseases among the people and the sanitary conditions by which they are surrounded.

ORDER.—Ordered that the above Remarks be printed and circulated for general information, also that the Review be published in the *Punjab Government Gazette*.

By order of the Hon'ble the Lieutenant-Governor,

W. M. YOUNG,

Secretary to Government, Punjab.

(2)
SECTION I.—METEOROLOGY.

No Remarks.

Omitted from the Report, vide Government of India No. 9—258, dated 4th September 1878, to address of Secretary to Government, Punjab).

SECTION II.—EUROPEAN ARMY.

No Remarks.

SECTION III.—NATIVE ARMY.

No Remarks.

SECTION IV.—JAILS.

No Remarks.

(Vide Remarks on Section I).

SECTION V.—VITAL STATISTICS.

BIRTH REGISTRATION.

1. The year 1881 shows a marked improvement in the birth registration. There was a total of 695,766 births registered or no less than 151,107 more than the number returned in the previous year. The births for 1881 give a rate of 40 per mille of the population according to the census of 1868, and those for 1880 a ratio of only 31 per mille. The proportion of births to population, it will thus be seen, is very satisfactory during the year under review as compared with its predecessor, and indicates, for the most part, the rapid progress made in the registration system. Of the 695,766 births in 1881, there were 374,599 of males and 321,167 of females, or in a proportion of 116 male to every 100 female births, the corresponding percentage in 1880 being as high as 121. The proportion during the year under report, *viz.*, 116, as compared with 121 in 1880, is much nearer the corresponding average ratio of 104 which obtains in England.

2. The statement given in the margin shows the aggregate number of births registered by quarters in the Punjab Province during 1881 side by side with the corresponding results in 1880. It will be seen at a glance over the figures that the increase in 1881 over the number registered in the previous year has occurred in every quarter of the year. Thus in the first quarter of 1881, the increase over the corresponding quarter of 1880 was 58,346; in the second quarter, the increase was 32,422; in the third quarter it amounted to 54,018; in the fourth quarter, it was 6,321; or a total increase of 151,107 during the whole of the year. The second quarter of the year is evidently the period in which the birth-rate in the Province is always at its minimum. During the past two years, the lowest number of births registered was in the second quarter.

Births by Quarters—		
	1880.	1881.
1st Quarter	114,729	173,075
2nd „	96,871	129,293
3rd „	144,340	198,358
4th „	188,719	195,040

Birth-rate amongst the urban and rural populations.

	1880.		1881.	
	Urban.	Rural.	Urban.	Rural.
1st Quarter	31	26	36	40
2nd „	22	22	30	29
3rd „	35	33	48	45
4th „	46	43	44	45
For the year	33	31	39.5	39.7

3. In the statement shewn in the margin, the birth-rates amongst the urban and rural populations of the Punjab Province during the several quarters of the year 1881 are contrasted with the corresponding rates in 1880.

The average birth-rates amongst the town and village populations in 1881 were, it will be seen, *on a par*. In the previous year the urban birth-rate had exceeded the rural by 2. This shows clearly that only in the second year of the introduction of birth registration in the rural circles, the system has become as popular as in towns in which latter it has been in force for the last 12 or 13 years. It is to be hoped that the villagers will show the same amount of readiness to improve the sanitary condition of their villages as they have undoubtedly done in the matter of registration.

4. The improvement in registration was not confined to particular localities but was almost general throughout the Province. The following table will show the results in the several districts during 1881 in juxta-position with those obtained in the previous year:—

	1880.	1881.		1880.	1881.
1. Delhi	31	49	17. Gujranwála	38	44
2. Gurgaon	22	40	18. Ferozepore	43	43
3. Karnal	31	43	19. Rawalpindi	25	39
4. Hissar	33	40	20. Jhelum	32	39
5. Rohtak	30	47	21. Gujrat	41	42
6. Sirsa	37	39	22. Shahpur	39	42
7. Umballa	28	38	23. Mooltan	33	38
8. Ludhiána	35	41	24. Jhang	32	36
9. Simla	12	16	25. Montgomery	33	39
10. Jullundur	35	43	26. Muzaffargarh	35	47
11. Hoshiárpur	29	43	27. Dera Ismail Khan	24	29
12. Kangra	20	27	28. Dera Gházi Khan	26	26
13. Amritsar	41	47	29. Bannu	22	26
14. Gurdáspur	29	43	30. Pesháwar	9	19
15. Siáikot	37	44	31. Hazára	15	30
16. Lahore	46	49	32. Kohát	12	21

5. It will be seen from the above table that with two exceptions, *viz.* Ferozepore and Dera Gházi Khan there has been an increase in every district of the Province during the year under report as compared with its immediate predecessor. The excess was most marked in the districts of Delhi, Gurgaon, Rohtak, Rawalpindi, Hazára, Karnal, Hoshiárpur, Gurdáspur, and Muzaffargarh. In the five first mentioned districts, that is, from Delhi to Karnal, the increase in 1881 was partly due to the low birth-rate in 1880 caused by the prevalence of epidemic fevers during the autumnal months of the two preceding years of 1878 and 1879. In the Frontier districts, also, there was a considerable increase in the birth-rate during the year under report, though there is still much room for further improvement in them. It will be seen from the

District birth-rate analysed.

Annual Form No. I. appended to this report that a large number of female births was omitted to be registered; thus in the Peshawar district there were 5,917 male births registered against only 3,364 female births; in Kohát 1,811 against only 1,179; in Dera Gházi Khan 4,693 against 3,373, and in Bannu 4,407 against 3,176.

The figures in these districts show respectively a proportion of 57, 65, 72 and 72 female births against every 100 births of males. The ratio of total births, both male and female, to per mille of population also was very low, especially in Pesháwar and Kohát districts where it was only 18 and 20 respectively as against the average Provincial birth-rate of 40. There is no doubt that not less than half the number of births that occurred in these districts was left unregistered.

On analysing the birth-rates, as given in the above table for the other districts, excluding those on the Frontier, it would appear that in no less than 17 of them, the per mille birth-rate ranged between 40 and 49, while in 7 others it varied between 36 and 39 per 1000. The birth-rate in the Kangra district is still far from satisfactory being only 27 per mille, though compared with 20 of the previous year, there is considerable improvement. In the Simla district, also, the birth-rate is very low, even after due allowance being made for the great excess of the male over the female population of the Simla sanitarium. The deficient state of birth registration in the Simla and Kangra districts as well as of those on the Frontier will, it is hoped, attract the attention of district Officers and necessitate the adoption of such measures as may improve registration without causing unnecessary offence to the people.

DEATH REGISTRATION.

6. Compared with 1880, the year 1881 now under report was unhealthy, the total deaths registered from "all causes" of disease being 519,779 as against 472,731.

General results of death registration.

This shows an excess of no less than 47,048 in 1881 over the number recorded in the preceding year. By far the greater portion of this increased amount of mortality was due to the sickly influences of the season, but some portion, probably one-fourth, may be due, also, to the greater efficiency with which registration was conducted in the present as compared with the past year. That a marked improvement has taken place in the system, is evident from the fact that although the excess under the head of fevers—a class of disease that chiefly contributed to the excess mortality in 1881 over the previous year—was only 8 per cent; under "all other causes" of death the increase on the other hand was no less than about 18 per cent. Thus under the head of "fevers" the deaths registered were 355,279 as against 327,727 in the preceding year, while under "all other causes" the number was 135,263 against 114,849. Epidemic Cholera, also, was prevalent in the Province, the number reported to have occurred from this disease in 1881 being 5,207 compared with only 274 registered the year before. Small-pox, however, was less prevalent in 1881 than in the previous year, the mortality caused by it being only 6,749 against 9,145. With regard to the proportion in which the mortality from "all causes" was registered amongst the total population in both the years, it will be seen that in 1881 the ratio per 1,000 souls according to the old census population of 1868, was 30; in 1880 it was 27. The ratio of male to 100 female deaths was 116; in 1880 it was 124, and the same was "the usual average rate in the Punjab since 1868." So that the proportion in 1881 as compared with the previous year approached much nearer to the corresponding average rate of 107 in England—a remarkable instance illustrating the progress which registration has made during the year under review.

7. So far, the general results of death registration during 1881, have been compared with

The mortality from chief diseases during the year 1881 compared with the whole series of years since 1868.

those obtained in its immediate predecessor, the year 1880. But it will be interesting to contrast the leading features of the year 1881 with those of the whole series separately since 1868 when the system of registration was for the first time introduced upon a recognized basis in the Punjab

Province. The following table will show the information required for this purpose.

Table shewing the mortality from different causes in the Punjab during the 14 years from 1868 to 1881 inclusive:—

Year.	Cholera.	Small-pox.	Fevers.	Bowel complaints.	All other causes.	Total.	Death-rate per mille of population.
1868	532	24,222	151,337	17,823	73,871	267,785	15
1869	9,258	53,169	272,946	30,953	87,495	453,821	26
1870	469	27,163	275,093	27,249	88,952	418,926	24
1871	369	25,534	213,548	21,678	102,249	363,378	21
1872	8,727	23,728	264,711	23,345	110,097	430,608	25
1873	148	25,699	219,909	19,640	91,757	357,153	20
1874	78	12,026	190,631	16,407	97,571	316,713	18
1875	6,246	13,594	279,841	27,550	119,977	447,208	26
1876	5,736	10,254	351,286	27,271	102,297	496,844	28
1877	29	12,296	219,281	17,664	101,662	350,932	20
1878	215	40,271	440,492	32,071	115,722	628,771	36
1879	26,135	49,489	472,939	29,612	95,038	673,213	38
1880	274	9,145	327,727	20,736	114,849	472,731	27
1881	5,207	6,749	355,279	17,281	135,263	519,779	30

8. This is not the proper place to enter into a *detailed* retrospect of the statistics of the principal death causes, such as Fevers, Cholera, and Small-pox, and to analyze the testimony they bear to the hitherto unknown laws under which these diseases are found to have originated and assumed epidemic proportions in the different parts of the Province. A very cursory review will here suffice. As regards Cholera, the statistics show very clearly two most important facts in connection with its extent, and course of prevalence. *Firstly*, the slow yet steady decline in the Cholera mortality from one epidemic year to another, from 1869 down to 1881. Thus in the successive epidemic years as shewn in the table the mortality caused by the disease was as follows:—

						Deaths.
First epidemic in 1869	...	...	...	...	...	9,258
Second do. in 1872	...	...	...	...	...	8,727
Third do. in 1875	...	...	...	...	...	6,246
Fourth do. in 1876	...	...	...	...	...	5,736
Sixth do. in 1881	...	...	...	...	...	5,207

The fifth epidemic year *viz.*, 1879, is excluded from the series because of its exceptional nature, being commonly known as the "Hurdwar Cholera" year. This diminution in the Cholera mortality year by year, is, to say the least, the most remarkable feature in the history of Cholera in the Punjab Province, and is alone sufficient to draw the attention of District Officers to the necessity of pushing on the good work of sanitary improvements which have, it need scarcely be added, brought about such a good result. For there seems to be no other cause to account for this marked decrease than that since 1869 the sanitary condition of the country, though still far from satisfactory, has improved especially in the principal municipal towns. *Secondly*.—The *triennial* occurrence of Cholera in an epidemic form. The prevalence of the disease epidemically in 1872, 1875 and 1879, as will be seen at a glance on reference to the above table, and its absence in the two preceding years in each case is very remarkable. The cycle was, however, broken in two instances; the first in 1876—a continuation, in the Western districts of the Province, of the epidemic of the previous year which was confined to Eastern Districts exclusively; and the second in the year under report. But as regards the latter year it will be remembered that in 1869, also, there was a similar break. The early recurrence of the disease in these two years 1869 and 1881, may perhaps be related to the unusual prevalence in each case, of the Hurdwar Cholera, in 1867 and 1879 respectively. The statistics of small-pox, also, show a decided falling off in its death-rate, due, to some extent no doubt, to the spread of vaccination. Excepting the years 1869, 1878, and 1879, there is a most marked decline year by year in the number of deaths registered under the head of small-pox *viz.*, from 27,163 in 1870 to only 6,749 in the year under report. For the first period, from 1870 to 1873, the deaths in round numbers varied between twenty-seven thousand to twenty-three thousand, in the second period, *viz.* 1874 to 1877 the number ranged between thirteen thousand to ten thousand, and in the last period, that is, 1880 and 1881, between only nine thousand and six thousand. Owing to improvement in registration and, also, to certain exceptional circumstances as explained in Section VI of previous years' Annual Report, under the head of "Fevers," the mortality from these diseases has been comparatively very high in the later years of the series. The statistics for "Bowel Complaints" call for no special remarks except that the mortality from them has increased and decreased hand-in-hand with the respective rise and fall in the death-rate from fevers.

9. The last column of the table shows the death-rate per mille of population. Next to 1878 and 1879, the year under review had a rate higher than that recorded in any one year of the series. The Punjab death-rate, it will be seen, is not only very unsteady, but also extremely excessive as compared with the corresponding death-rate in England. For instance in the Punjab, the ratio per mille of population was as high as 38 and 36 respectively during the years 1878 and 1879, while on the other hand it was as low as 20 in 1877 and only 18 in 1874. In England, not only is the death-rate low, but its rise or fall, also, in each year is very insignificant. Table 2 of the Report of the Registrar General of Births and Deaths of England for 1879, gives the death-rates in that country for 42 years, from 1838 to 1879, from which it will be seen that the death-rate per 1,000 persons living varied in those years from only 20 to 25.

10. The details of the Urban and Rural death-rates of the Punjab Province are shewn in Annual Form No. VI. appended to this Report. The difference between the death-rates of both these classes of the population is most marked. The Urban death-rate in 1881, it will be seen was 48 per 1,000 against the Rural death-rate of 29 due to the undermentioned causes of deaths respectively:—

	Urban death-rate.	Rural death-rate.	Both Rural and Urban.
Cholera	2.84	0.09	0.30
Small-pox	0.30	0.39	0.38
Fevers	27.38	19.80	20.32
Bowel complaints	3.38	0.79	0.99
Injuries	0.34	0.32	0.32
All other causes	14.00	6.88	7.41

11. The death-rates from "all causes" during each month of the year 1881 are contrasted

Mortality by months.		1880.	1881.
January	32	29	
February	25	26	
March	23	23	
April	20	22	
May	24	22	
June	25	22	
July	20	20	
August	25	21	
September	32	37	
October	35	52	
November	31	44	
December	32	38	

with those of the previous year in the table given in the margin from which it will be seen at a glance that October and November were the unhealthiest of all the months of the year under review, having a death-rate as high as 52 and 44 per mille of population per annum respectively, the corresponding ratios in the previous year being only 35 and 31. The sickly season which has rendered the year unhealthy in comparison with 1880, it would appear, commenced with September in which the death-rate rose as high as 37 from only 21 in the preceding month of August, and continued to prevail, though with less fatality, till December reaching the maximum as

already stated in the intervening months of October and November. The rate of mortality in December was 38 or 1 per mille more than in September. The next highest death-rates it will be seen, were recorded in January and February due, no doubt, to the continuation of the influences of the sickly season of the previous year. From March to August, (6 months), the mortality in 1881 was evidently at its normal standard, varying from 23 in March to 20 in July.

District death-rate.

12. The following table shows the annual death-rates per 1,000 of population in the several districts of the Punjab Province registered during 1881:—

1. Delhi	38	17. Gujranwála	26
2. Gurgaon	29	18. Ferozepore	30
3. Karnál	36	19. Rawalpindi	25
4. Hissar	27	20. Jhelum	24
5. Rohtak	31	21. Gujrat	21
6. Sirsa	28	22. Shahpur	22
7. Umballa	34	23. Mooltan	32
8. Ludhiána	30	24. Jhang	18
9. Simla	22	25. Montgomery	28
10. Jullundur	30	26. Muzaffargarh	31
11. Hoshiárpur	31	27. Dera Ismail Khan	22
12. Kángra	29	28. Dera Ghazi Khan	18
13. Amritsar	50	29. Bannu	21
14. Gurdáspur	29	30. Pesháwar	24
15. Siálkot	28	31. Hazára	20
16. Lahore	41	32. Kohát	19

13. It will be seen from this table that the highest death-rate in 1881 was recorded in the district of Amritsar, viz., 50 per mille of population against only 29 in the previous year. This increase is due especially to the excessive mortality caused by epidemic fevers in the city of Amritsar. Next to Amritsar in the order of high death-rate, comes the district of Lahore with a rate of 41 per mille the ratio in the previous year being 31. In this district, also, the increased death-rate was the result mostly of the prevalence of epidemic fevers. Delhi district had a death-rate of 38, Karnál 36, Umballa 34, Mooltan 32, Rohtak, Muzaffargarh, and Hoshiárpur 31 each, Ferozepore and Ludhiána 30 each. In 9 districts the death-rate varied between 29 and 25 per mille, and in 8 others between 24 and 20. In Jhang, Kohát and Dera Ghazi Khan it was below 20 per mille.

14. In para. 8 of my report for the past year, I gave a statement of the annual death-rates in each district of the Punjab from 1868 to 1880 inclusive. On comparing the rates for the several districts shown in that statement with those for 1881, it will be seen that sickness was not so wide-spread and fatal in the year under review as in 1878 and 1879. The highest death-rate registered in 1881 was, as already stated, 51 in Amritsar and 41 in Lahore, while in 1878 it was as high as 72 in Jullundur, 68 in Gurgaon, 55 in Delhi, 46 in Lahore, 45 each in Ludhiána and Amritsar and 43 in Ferozepore. In 1879 sickness covered a still larger area and was more fatal than in 1878. The district which suffered most was Gurgaon in which the per mille death-rate was 81—a death-rate much higher than that registered in any one district since the introduction of death registration in the Province. There were in 1879 no less than 11 districts including Gurgaon, which had a death-rate upwards of 40 per mille; viz., Delhi 71, Rohtak and Rawalpindi 67 each, Karnál 59, Amritsar and Jhelum 43 each, Hissar and Umballa 42 each, Lahore 41 and Sirsa 40.

The above rates show the extent to which the several districts of the Province are subject to the fatal influences of epidemic disease. These death-rates are exceedingly high compared with the death-rate registered in England. From Table 26, given at page LXVII of the forty-second Annual Report of the Registrar General of Births, Deaths and Marriages in England, showing "Deaths to 1,000 persons living in the several counties of England during each of the eleven years 1869-79," it appears that there is not a single county in which the death-rate exceeded 28·3 per mille in any of these 11 years. Even this death-rate of 28·3—considerably low as it is compared with that of the Punjab districts—is quite exceptional as it occurred only in a single year in Lancashire and Durham—counties which would, on reference to the table, appear to be the only districts in England and Wales out of 44 in which the death-rate was so high as 28·3. In none of the other 42 counties did the death-rate exceed 25·7 in any year of the series, while in most of them the proportion varied between 15 and 20 per 1,000 persons living.

15. The details of the classification of deaths by ages in the several districts of the Province are shown in Annual Form No. IV appended to this report. Taking the Province as a whole, it would appear from the statement of the general result of death registration by different ages, as given in the margin, that, as usual, the mortality amongst the infant population was excessive. Of the grand total of 519,779 deaths registered in the whole Province, there were no less than 240,971 which occurred amongst children under six years of age. This number is equal to 46 per cent. of the total Provincial mortality. Of old persons aged 60 and upwards, the number of deaths reported to have occurred during the year was 85,497.

Deaths by Ages.		
	Males.	Females.
Under 1 year ...	77,572	67,966
1 to 6 ...	49,857	45,576
6 to 12 ...	13,268	11,678
12 to 20 ...	10,453	9,499
20 to 30 ...	17,881	18,383
30 to 40 ...	18,308	16,742
40 to 50 ...	22,580	16,808
50 to 60 ...	22,481	15,230
60 and upward ...	46,874	38,623
All ages ...	279,274	240,505

With regard to the proportion of the mortality between the sexes, it will be seen that with one exception there was an excess of male over female deaths in all the different life-periods specified in the table given in the margin of the above para. That exception was the age between 20 and 30 at which the female deaths exceeded the male by 502. On analysing the district returns shown in Annual Form No. IV, this excess, it will be seen, was most marked in Hoshiárpur, Kángra, Amritsar, Gurdáspur and Siálkot.

The Resolution of the Government of India No. 1—50-61, dated 4th March 1882 was received too late to permit of the alterations in the age-periods referred to in that Resolution being made in Annual Return No. IV for the year under review. The orders of Government will be complied with from the commencement of the current year, 1882.

BIRTH AND DEATH REGISTRATION.

16. It is to be regretted that owing to the results of the recent census not being available earlier, the birth and death-rates for the districts and towns as shown in the returns for the year under review, could not be calculated on the revised population. The Deputy Superintendent of census operations has, however, lately furnished me with the Abstract Population Statements, and I take this opportunity to give below the new population in each district of the Punjab, together with the total births and deaths and the ratios per 1,000 of this population:—

No.	DISTRICT.	Population according to Census 1881*	Total number of Births.	Total number of Deaths.	Birth-rate.	Death-rate.
1	Delhi	640,367	29,546	23,022	46	36
2	Gurgaon	641,848	27,787	19,945	43	31
3	Karnál	622,621	26,236	21,991	42	35
4	Hissar	504,183	19,332	12,896	38	25
5	Rohtak	553,609	25,021	16,714	45	30
6	Sirsa	253,275	8,280	5,982	33	24
7	Umballa	1,026,582	37,834	34,268	37	33
8	Ludhiána	618,835	24,018	17,715	39	29
9	Simla	33,214	532	727	16	22
10	Jullundur	780,087	33,490	23,443	43	30
11	Hoshiárpur	901,381	40,215	28,826	45	32
12	Kángra	729,239	20,054	21,668	27	30
13	Amritsar	892,035	39,293	42,096	44	47
14	Gurdáspur	821,476	38,665	26,466	47	32
15	Siálkot	1,000,236	43,686	28,379	44	28
16	Lahore	905,697	37,981	31,601	42	35
17	Gujránwála	616,892	24,063	14,174	39	23
18	Ferozepore	631,819	23,108	16,318	36	26
19	Rawalpindi	792,855	27,102	17,733	34	22
20	Jhelum	584,579	19,735	11,825	34	20
21	Gujrat	689,115	26,100	12,868	38	19
22	Shahpur	421,508	15,336	8,272	36	20
23	Mooltan	540,761	17,365	14,844	32	27
24	Jhang	395,296	12,370	6,470	31	16
25	Montgomery	426,529	14,020	9,948	33	23
26	Muzaffargarh	338,605	14,030	9,063	41	27
27	Dera Ismail Khan	441,649	11,569	8,626	26	19
28	Dera Gházi Khan	363,346	8,066	5,493	22	15
29	Bannu	332,577	7,583	6,192	23	19
30	Pesháwar	587,201	9,281	12,233	16	21
31	Hazára	407,075	11,078	7,218	27	18
32	Kohát	181,540	2,990	2,763	16	15
	TOTAL	18,676,032	695,766	519,779	37	28

* Exclusive of the population of Military Cantonments and Khaibar Pass.

Excluding the population of the Military Cantonments for which Vital Statistics are prepared separately, and that of the Khaibar Pass which is not under registration, the population in the Punjab enumerated in 1881 amounts to 18,676,032 against 17,487,125, in 1868 so that during the interval of 13 years the population has increased by 1,188,907 or about 7 per cent.—a result which compares very favorably with that deduced from the Vital Statistical figures given in para. 12 clause (1) of my Sanitary Report for last year. Calculating on the increased population the correct provincial birth-rate during the year under review was, as will be seen by reference to the above table, 37 per 1,000, and the death-rate 28 per 1,000. According to the old census population of 1868, the birth-rate was 39 and the death-rate 30 per mille. Thus the difference between the rates reckoned on the old and new populations enumerated in 1868 and 1881, respectively, does not exceed 2 per 1,000.

There was an excess of 175,987 births over the deaths registered during 1881. The excess has occurred in all the districts except two, *viz.*, Simla and Pesháwar. In the former district the birth-rate fell short of the death ratio by 6 and in the latter by 5 per mille. In Pesháwar the low birth-rate is evidently the result of gross neglect in registration, whereas in the Simla district it is partly due, as already mentioned in a previous para, to the great excess in the male over the female population in the sanitarium. In 18 out of the 32 districts in the Province, the birth-rate exceeds the death-rate very considerably; particularly in the following :

	<i>Birth-rate.</i>	<i>Death-rate.</i>	<i>Excess of birth-rate over death-rate.</i>
Gujrat	38	19	19
Siálkot	44	28	16
Gujránwála	39	23	16
Shahpur	36	20	16
Jhang	31	16	15
Rohtak	45	30	15
Gurdáspur	47	32	15
Jhelum	34	20	14
Muzaffargarh	41	27	14
Hissar	38	25	13
Jullundur	43	30	13

17. In the subjoined table the results of birth registration during the year under report, in the Birth registration in large 52 large municipal towns of the Punjab, are contrasted with the results of municipal towns. death registration obtained in the same year,

Comparative Statement of Births and Deaths registered in the 52 large Municipal towns in the Punjab and their birth and death-rates during the year 1881.

Number.	DISTRICTS.	TOWNS.	Population.	BIRTHS.			DEATHS.			BIRTH-RATES.			DEATH-RATES.		
				Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1	Delhi	Delhi	115,992	3,275	3,038	6,313	2,923	2,617	5,540	28	26	54	47	48	48
2		Do. Suburbs	44,561	1,402	1,272	2,674	895	763	1,658	31	28	60	36	38	37
3		Sonepat	13,637	282	232	514	184	166	350	21	17	38	26	25	26
4	Gurgaon	Farakhnagar	10,594	260	238	498	222	227	449	24	22	47	42	42	42
5		Rewari	25,190	638	572	1,210	370	348	718	25	23	48	29	28	28
6		Firozpur	10,530	221	222	443	232	213	445	21	21	42	42	42	42
7		Palwal	13,553	286	289	575	293	287	580	21	21	42	42	43	43
8	Karnal	Karnal	24,015	447	371	818	566	510	1,076	19	15	34	44	45	45
9		Kaithal	15,790	185	151	336	183	165	348	12	9	21	23	21	22
10		Panipat	24,509	581	522	1,103	504	447	951	24	21	45	40	37	39
11	Hissar	Hissar	14,162	243	198	441	280	240	520	17	14	31	37	36	37
12		Hansi	12,210	203	207	410	192	178	370	17	17	33	30	30	30
13		Bhiwani	33,220	736	666	1,402	556	556	1,112	22	20	42	32	35	33
14	Rohtak	Rohtak	14,994	275	247	522	211	175	386	18	16	35	27	24	26
15		Jhajjar	12,456	308	248	556	157	165	322	25	20	45	25	26	26
16	Sirsa	Sirsa	12,807	161	136	297	143	129	272	12	11	23	20	23	21
17	Umballa	Umballa	26,258	602	534	1,136	700	649	1,349	23	20	43	48	55	51
18		Jagadhri	12,522	282	206	488	235	215	450	22	16	39	34	38	36
19		Shahabad	11,660	214	157	371	164	147	311	18	13	32	26	28	27
20		Sadhaura	11,167	179	200	379	124	143	267	16	18	34	21	27	24
21		Rupar	10,261	177	167	344	155	101	256	17	16	33	26	23	25
22	Ludhiána	Ludhiána	40,385	942	865	1,807	757	737	1,494	23	21	45	34	41	37
23		Jagraon	16,321	416	387	803	309	290	599	25	24	49	36	37	37
24	Jullundur	Jullundur	35,222	742	685	1,427	835	798	1,633	21	19	40	43	50	46
25		Do. Suburbs	15,792	291	277	568	294	266	560	18	18	36	36	36	36
26		Kartarpur	11,053	182	141	323	180	181	361	16	13	29	30	35	33
27		Rahon	12,914	251	241	492	294	301	595	19	19	38	43	50	46
28	Hoshiárpur...	Hoshiárpur	13,138	285	270	555	291	302	593	22	20	42	41	50	45
29		Tanda and Umar	13,971	252	256	508	268	271	539	18	18	36	36	41	38
30	Amritsar	Amritsar	136,166	2,962	2,853	5,815	8,468	8,516	16,984	22	21	43	108	146	125
31	Gurdáspur	Batála	26,929	464	443	907	635	730	1,365	17	16	34	45	57	51
32	Sialkot	Sialkot	32,989	707	585	1,292	686	703	1,389	21	18	39	38	46	42
33	Lahore	Lahore	92,035	1,808	1,549	3,357	2,579	2,614	5,193	20	17	36	50	64	56
34		Do. Suburbs	36,466	404	345	749	1,129	520	1,649	11	9	20	48	41	45
35		Kasur	16,793	322	290	612	309	284	593	19	17	36	36	35	35
36	Gujránwála...	Gujranwala	20,362	473	433	906	436	467	903	23	21	44	39	51	44
37		Wazirabad	15,346	323	260	583	257	231	488	21	17	38	29	35	32
38	Ferozepore	Ferozepore	15,168	373	345	718	430	358	788	24	23	47	49	55	52
39	Rawalpindi	Rawalpindi	20,802	468	424	892	678	391	1,069	22	20	43	53	49	51
40	Jhelum	Jhelum	11,319	124	69	193	148	87	235	11	6	17	20	22	21
41		Pind Dádan Khan	15,397	347	331	678	220	217	437	22	21	44	27	30	28
42	Gujrát	Gujrát	17,401	449	401	850	229	196	425	26	23	49	25	24	24
43		Jalalpur	14,014	331	302	633	244	215	459	24	21	45	32	33	33
44		Bhera	14,710	423	432	855	231	232	463	29	29	58	30	33	31
45	Mooltan	Mooltan	29,448	793	725	1,518	546	474	1,020	27	25	51	35	34	35
46		Do. Suburbs	21,430	548	462	1,010	472	359	831	25	21	47	39	38	38
47	Jhang	Maghiána	13,618	253	239	492	158	145	303	18	17	36	20	24	22
48		Chiniot	11,999	231	219	450	135	151	286	19	18	37	21	26	24
49	Dera I. Khan...	Dera Ismail Khan	19,954	352	262	614	258	219	477	18	13	31	24	24	24
50	Dera G. Khan...	Dera Gházi Khan	19,133	320	269	589	226	227	453	17	14	31	21	27	24
51	Pesháwar	Pesháwar	58,430	1,148	918	2,066	1,304	1,163	2,467	20	16	35	40	45	42
52	Kohát	Kohát	11,043	176	115	291	192	128	320	16	10	26	32	25	29
GRAND TOTAL			1,299,686	28,117	25,266	53,383	32,487	30,214	62,701	22	19	41	46	51	48

First with regard to birth registration. It will be seen that there was a total of 53,383 births registered in the 52 towns taken as a whole. This shows a very considerable increase, viz., of 8,650 births over the number registered in the previous year. The births in 1881 are thus equal to 41 and in 1880 to only 34 per mille of the population. The proportion between male and female births is as 111 male to every 100 female births registered, against a corresponding ratio of 112 last year.

In 4 out of the 52 towns, the birth-rate varied between 51 and 60 per mille, viz., Delhi 54, Delhi Suburbs 60, Bhera in Shahpur 58 and Mooltan 51 per mille. In 20 towns the birth-rate varied between

40 and 49 per 1,000; in 22 others between 30 and 39. In the towns of Kaithal, Sirsa, Kartarpur, Jhelum and Kohát in which the birth-rate falls shorts of 30 per 1,000 there is a very strong suspicion of neglect in registration.

On comparing the birth-rates for the several towns registered during the year under review with those for the previous year 1880, it appears that the increase in the birth-rate was most marked in the several towns situated in the districts of Delhi, Gurgáon, Karnál, Rohtak, Umballa and Rawalpindi. This is attributable not to any improvement in registration, but to the excessive prevalence of epidemic fevers during the years 1878 and 1879, which, besides causing a heavy mortality, prostrated the entire population and thus reduced very considerably the birth-rate in the succeeding period, viz., 1880. The names of those towns as well as the birth-rates registered in them in both the years 1881 and 1880 are given below :—

				Birth-rate in 1881.	Birth-rate in 1880.	Excess in 1881.
DELHI	{	Delhi	...	54	38	16
		Do. Suburbs	...	60	38	22
		Sonipat	...	38	27	11
GURGAON	{	Farakhnagar	...	47	22	25
		Rewári	...	48	32	16
		Firozpur	...	42	23	19
KARNAL	{	Karnál	...	34	23	11
		Panipat	...	45	34	11
ROHTAK	{	Rohtak	...	35	23	12
		Jhajjar	...	45	28	17
UMBALLA	...	Jagádhri	...	39	27	12
RAWALPINDI	...	Rawalpindi	...	43	32	11

18. Adverting to death registration it will be seen by reference to the tabular statement given in para. 17 that the death-rate contrasts very unfavorably with the

Death registration in large Municipal towns. birth-rate, the total deaths registered in the 52 Municipal towns being 62,701 or 9,318 more than the number of births registered in the same period. The average death-rate per 1,000 of population in all the towns taken together was 48 against a birth-rate of 41. The death-rate in the city of Amritsar was most excessive owing to the prevalence of epidemic fevers. The total deaths registered during the year were no less than 16,984 giving a death-rate of 12.5 per cent. of the population. The number of births registered during the same period was only 5,815. This shows an excess of 11,169 deaths over the births registered, or in other words, that the population was nearly decimated.

In several other towns the death-rate was high, as for example :—

District.	Town.	Per mille Death-rate.
DELHI	... Delhi	48
GURGAON	{ Farakhnagar	42
	{ Palwal	43
KARNAL	... Karnál	45
UMBALLA	... Umballa	51
JULLUNDUR	{ Jullundur	46
	{ Ráhon	46
HOSHIARPUR	... Hoshiárpur	45
GURDASPUR	... Batála	51
SIALKOT	... Siálkot	42
LAHORE	{ Lahore	56
	{ " Suburbs	45
GUJRANWALA	... Gujranwála	44
FIROZPUR	... Firozpur	52
RAWALPINDI	... Rawalpindi	51
PESHAWAR	... Pesháwar	42

Results of registration in selected villages on the Western Jamna Canal.

19. The results of registration in the selected villages situated on the Western Jamna Canal are shown in the subjoined statement.

Statement showing Births and Deaths registered in the villages situated on the

1 Number.	2 District.	3 NAME OF VILLAGES.	4 POPULATION ACCORDING TO CENSUS OF 1877.			5 TOTAL NO. OF BIRTHS REGISTERED.			6 TOTAL NO. OF DEATHS REGISTERED.			7 Birth-rate per mille of population per annum. Death-rate per mille of population per annum. Cholera			8 CAUSES OF DEATH.				
			Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Small-pox.	Fever.	Bowel complaints.	Injuries.	All other causes.			
1	DELHI.	Tajpur (Tihari Khurd) ...	214	205	419	13	9	22	14	13	27	52	64	...	20	...	...	7
2		Bathgaon ...	2,396	2,046	4,442	82	69	151	158	123	281	34	63	4	215	22	...	40	
3		Barawasani ...	988	907	1,895	57	41	98	77	63	140	52	74	1	75	12	2	50	
4		Mahra ...	873	773	1,646	39	30	69	50	57	107	42	63	...	77	3	...	27	
5		Dabarpur ...	253	203	456	9	7	16	7	9	16	35	33	...	13	...	...	3
6		Hulaheri ...	478	416	894	17	11	28	17	18	35	31	39	...	32	...	...	3
7		Garhi Brahmanan ...	277	268	545	12	17	29	13	12	25	53	46	...	22	...	...	3
8		Bádshahpur Majri ...	196	181	377	8	4	12	9	9	18	32	48	...	12	...	...	6
9		Jaji ...	296	285	581	14	13	27	17	11	28	46	48	...	19	2	...	7	
10		Kakrohi ...	1,089	1,020	2,109	41	59	100	55	71	120	47	60	1	86	4	1	34	
11		Juan ...	1,563	1,476	3,039	82	61	143	100	67	167	47	50	...	130	...	1	36	
12		Sitauli ...	432	403	835	16	17	33	25	32	57	39	68	...	48	...	...	9
13		Chitánah ...	442	393	835	25	15	40	33	18	51	48	61	...	33	8	...	10	
14		Kheri Darya ...	332	304	636	10	7	17	17	17	34	27	53	1	26	4	...	3	
15		Jafarabád ...	249	227	476	12	11	23	13	14	27	48	57	...	20	...	...	7
16		Khizarpur Ját ...	218	191	409	7	6	13	12	6	18	32	44	...	14	1	...	3	
17		Máihlana ...	614	537	1,151	22	31	53	54	47	101	46	88	3	86	...	...	12
18		Kareori ...	403	353	756	9	12	21	18	21	36	28	51	...	28	...	...	11
19		Hassanyárpur (Tihari Kalan) ...	217	188	405	9	6	15	14	6	20	37	49	...	14	...	...	6
20		Bágru ...	381	322	703	13	8	21	22	10	32	30	43	1	20	2	...	9	
21		Jharauti ...	261	253	514	17	6	23	11	12	23	45	43	...	13	...	...	10
22		Anandpur ...	151	136	287	6	7	13	8	10	18	45	63	...	18	...	...	...
23		Bhadhánah ...	648	585	1,233	22	18	40	37	36	73	32	59	...	54	3	1	15	
24		Jharant ...	318	261	579	12	14	26	17	9	26	45	43	1	20	...	...	5
25		Rohát ...	1,468	1,293	2,761	65	61	126	71	59	130	46	47	...	97	3	...	30	
		Total ...	14,757	13,226	27,983	619	540	1,159	869	750	1,619	41	58	1	1,192	64	5	346	
1	KARNATAKA.	Kharkali ...	72	50	122	1	4	5	3	1	4	41	33	...	1	...	...	3
2		Jhiwarheri ...	187	160	347	13	10	23	14	12	20	66	73	1	15	...	...	10
3		Hassanpur ...	207	190	397	11	10	23	8	7	15	58	38	...	12	...	...	3
4		Rasin ...	222	199	421	15	8	23	13	15	28	55	66	...	23	...	...	5
5		Phorlak ...	684	700	1,384	34	25	59	39	43	82	43	59	...	65	1	...	16	
6		Opli ...	36	44	80	2	1	3	1	...	1	37	12	...	...	...	...	1
7		Garaundah ...	2,061	1,568	3,629	96	89	183	77	50	127	51	35	1	72	2	1	51	
8		Malakpur ...	89	63	152	2	1	3	1	2	3	20	20	...	3	...	...	...
9		Bádshahpur ...	31	20	51	1	...	1	2	...	2	20	39	...	...	...	1	1
10		Ghora Gharri ...	89	75	164	5	5	10	8	12	20	61	121	...	16	...	...	4
11		Sheikhpura ...	395	379	774	29	13	42	10	7	17	54	22	...	12	...	...	5
12		Godah ...	627	551	1,178	21	21	42	20	15	35	36	30	...	25	...	1	9	
13		Kohand ...	651	501	1,152	26	14	40	15	16	31	35	27	...	25	...	...	6
14		Ganjar ...	311	249	560	17	4	21	16	9	25	37	45	...	21	...	...	4
15		Barauli ...	406	361	767	20	21	41	23	10	33	53	43	...	29	...	...	4
16		Babarpur ...	202	183	385	10	12	22	6	9	15	57	39	...	8	...	...	7
17		Begampur ...	127	122	249	9	6	15	3	10	13	60	52	...	5	...	...	8
18		Dolánah ...	494	438	932	21	13	34	23	15	38	36	41	...	22	...	...	16
19		Kotánah ...	40	27	67	4	2	6	1	4	5	89	75	...	3	...	...	2
20		Baholi ...	363	235	598	5	5	10	14	12	26	17	43	...	26	...	...	...
21		Razapur ...	88	35	123	1	3	4	2	3	5	32	41	...	4	...	...	1
22		Khacrolí ...	532	458	990	17	21	38	28	24	52	38	52	...	47	...	...	5
23		Muhammadpur ...	340	291	631	13	14	27	11	12	23	43	36	...	13	1	...	9	
		Total ...	8,254	6,899	15,153	373	304	677	338	288	626	45	41	2	447	4	3	170	

Western Jamna Canal in the Delhi and Karnal Districts during the year 1881.

9										10												11									
AGES AT DEATHS.										DEATHS BY MONTHS.																					
Under 1 year.		1 year and under 6.		6 and under 12.		12 and under 20.		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Number.	
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.														
3	2	2	1	3	1	2	1	1	2	2	5	1	1	4	3	2	1	1	1	1	1	1	1	2	3	4	2	3	1		
37	28	15	17	10	4	8	7	2	10	15	16	23	14	13	11	13	16	24	29	20	17	15	13	8	12	24	38	40	41	2	
24	17	12	10	7	1	3	2	2	5	6	6	7	9	6	6	2	5	9	11	14	6	6	4	5	6	14	19	28	18	3	
12	14	10	9	1	2	4	3	2	5	5	7	5	4	3	7	7	6	6	18	7	5	8	8	4	2	19	8	14	8	4	
...	2	...	1	...	...	...	...	4	1	1	1	...	1	1	1	1	...	1	2	1	1	2	...	3	...	2	...	1	3	5
2	5	2	3	2	2	...	...	...	...	5	1	2	...	2	4	2	3	3	2	2	1	4	2	2	1	5	3	7	2	6
3	3	4	...	...	...	...	...	...	...	2	3	1	2	1	3	2	1	2	...	1	2	2	1	1	...	4	3	3	6	7
4	2	1	2	...	1	1	...	1	...	1	...	2	...	...	2	...	2	1	3	1	3	1	...	2	1	...	1	5	8	
4	4	1	2	...	1	1	...	4	1	2	...	2	...	1	1	3	1	2	3	2	...	3	4	1	1	3	1	6	2	9	
14	20	17	10	3	...	3	9	8	2	7	1	3	5	13	4	7	8	9	10	7	6	6	7	8	15	12	16	22	10		
25	17	10	4	4	1	7	5	11	7	11	7	10	10	11	3	11	13	16	20	16	17	14	10	9	12	10	14	14	15	11	
3	8	3	1	1	1	1	4	7	1	5	3	5	5	2	5	2	6	8	4	1	4	4	1	2	6	4	7	10	12		
7	8	8	2	...	6	...	12	4	4	...	2	1	4	2	...	1	4	10	2	2	2	4	...	2	1	6	9	8	13		
5	2	2	4	2	...	...	12	3	3	3	2	4	1	...	...	1	6	4	2	1	1	4	...	2	2	5	7	...	14	
4	2	2	1	1	...	...	2	...	3	1	1	...	3	3	4	1	...	...	5	1	2	1	1	4	2	5	5	5	15	
5	1	1	1	1	...	...	1	1	1	3	...	2	1	...	...	2	1	2	...	3	...	...	1	1	3	1	4	16	16	
14	17	10	12	6	4	2	3	5	3	7	3	3	2	2	...	5	3	2	6	10	12	11	6	12	3	7	14	10	8	17	
1	7	2	4	...	3	...	3	1	...	1	3	2	5	4	1	2	3	1	3	2	3	1	5	1	1	10	5	4	18		
4	1	...	1	1	...	1	...	1	1	1	4	...	1	2	1	...	...	1	3	4	1	3	...	1	1	2	2	2	19	
5	3	4	1	1	3	2	3	...	1	...	3	1	1	...	2	2	2	2	4	3	4	1	1	1	1	1	3	7	3	20	
4	1	2	...	1	1	...	1	6	1	1	2	2	...	1	...	...	2	2	1	3	...	1	2	3	...	2	...	7	21	
2	1	1	1	...	1	...	2	...	2	3	1	1	...	...	2	3	...	1	1	1	1	...	...	1	1	1	6	3	22	
11	9	6	3	2	2	...	1	4	6	4	4	5	2	4	5	6	5	3	5	5	6	6	6	5	5	5	14	8	23		
4	2	1	2	1	2	...	1	1	3	0	1	...	1	3	4	...	1	2	4	...	2	4	...	1	4	3	3	2	24		
27	17	5	4	2	...	2	4	8	4	5	5	11	10	2	3	9	11	3	11	8	8	9	5	8	6	17	14	16	25	25	
224	193	121	96	39	21	49	36	100	75	83	78	99	79	72	83	82	89	116	151	126	107	109	91	76	75	151	176	224	217		
1	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	...	...	1	1	
4	4	3	3	1	1	...	2	1	1	1	1	1	...	1	2	...	1	4	...	3	5	4	1	1	1	...	4	2	2		
4	3	1	1	...	...	...	2	1	...	...	...	...	1	1	...	1	1	1	2	...	2	1	...	2	2	3	1	3		
3	3	3	3	...	1	2	1	3	2	2	1	...	1	2	1	...	1	...	1	4	2	1	...	5	2	6	4	2	4		
11	11	7	5	1	5	1	...	5	4	4	6	5	1	2	6	3	5	4	8	7	7	7	10	4	6	7	8	10	4	5	
1	1	6	
31	15	12	11	1	3	2	1	3	...	6	4	9	3	3	2	10	11	11	11	10	10	6	17	8	9	11	5	12	17	7	
...	1	1	1	1	...	1	1	8	
...	...	1	...	1	1	9	
...	3	2	3	1	1	...	1	1	3	1	...	...	1	2	1	...	5	5	...	1	1	...	1	...	1	4	...	...	3	10
3	2	...	1	...	...	...	2	3	1	...	...	1	2	...	2	...	2	...	2	1	2	...	2	1	2	...	2	2	3	11
5	1	3	...	2	...	...	1	2	3	3	4	2	1	3	5	...	2	9	...	1	2	...	4	4	4	4	5	4	12	
5	4	2	...	1	1	...	3	3	...	3	...	1	1	1	2	4	5	4	3	2	1	1	4	3	5	...	3	...	13		
4	2	1	3	1	1	...	1	1	1	1	5	...	1	...	2	1	5	1	4	2	...	2	2	...	1	...	...	8	14	
3	3	2	...	3	1	3	...	3	...	2	2	2	...	2	...	3	4	...	1	4	5	3	5	5	2	...	1	7	15		
2	3	2	2	...	1	1	...	...	1	1	1	...	1	...	...	...	...	1	2	1	...	1	...	1	3	...	2	4	16	
...	5	...	1	1	...	...	1	...	2	...	1	...	2	...	...	...	...	1	1	2	...	...	...	2	2	2	2	2	1	17
9	3	1	1	...	...	...	4	...	3	6	2	1	3	2	1	2	2	2	6	5	1	...	3	1	1	5	3	5	6	18
...	2	...	1	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	3	...	...	...	...	19
...	1	...	1	1	1	2	1	4	3	1	...	3	3	3	2	...	...	...	6	...	1	...	1	...	3	2	3	2	8	20
...	2	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	1	2	...	...	21
6	7	5	1	1	...	5	1	2	3	2	3	...	4	6	4	1	1	2	3	5	2	9	4	4	4	6	6	3	4	22	
5	4	1	1	1	1	...	1	...	3	2	1	...	2	1	...	...	...	1	4	2	1	...	1	2	3	2	...	2	5	23
97	79	47	37	11	15	21	8	35	26	32	39	36	22	28	28	31	34	42	59	58	40	42	53	33	49	64	43	62	81		

It will be seen from the above table that the total number of deaths registered in the group of 25 villages situated in the Delhi district was 1,619 equal to a death-rate of 58 per mille of population. The total births registered were only 1,159 or at the rate of 41 per mille. Thus the deaths exceeded the births by 460. The villages in the Karnal district were comparatively much healthier. In them the deaths registered were 626 against 677 births, the birth-rate was 45 and the death-rate 41.

The birth and death-rates in these two groups of villages during 1881 are contrasted in the following table with those that prevailed in previous years:—

		<i>Half year ending 1878.</i>	1879.	1880.	1881.	<i>Mean.</i>
DELHI VILLAGES ...	{ Birth-rate ...	55	24	31	41	38
	{ Death-rate ...	120	65	47	58	72
KARNAL Do. ...	{ Birth-rate ...	36	27	34	45	35
	{ Death-rate ...	57	76	44	41	54

The mean death-rate is very high, particularly in the villages situated in the Delhi district.

	<i>For Delhi Villages.</i>	<i>For Karnal Villages.</i>
The total population enumerated in 1877 was ...	27,983	15,153
The total deaths registered during the 3½ years ending in 1881 was ...	6,430	2,894
The total number of births registered in the same period was ...	3,477	1,971
The excess of deaths over births was ...	2,953	923

This shows that the population of the villages in the Delhi district censused in 1877 was more than decimated during the three and a half years ending in 1881. In those situated in the Karnal district also there was a very large reduction in the population.

The excessive mortality is, for the most part, due to the prevalence of epidemic fevers as will be seen from the subjoined table showing the total deaths registered from different causes during the 3½ years:—

	<i>Delhi Villages.</i>	<i>Karnal Villages.</i>
Cholera ...	4	7
Small-pox ...	16	100
Fevers ...	5,072	2,143
Bowel complaints ...	255	57
Injuries ...	27	11
All other causes ...	1,056	576
	<u>6,430</u>	<u>2,894</u>

These statistics show that more than three-fourths of the total mortality was caused by fevers alone, the fever-deaths in the Delhi and Karnal villages being 5,072 and 2,143 out of a total of 6,430 and 2,894 respectively from "all causes."

The seasonal incidence of mortality in the Delhi and Karnal villages will be seen from the table given in the margin. The monthly totals include the deaths for three years ending in 1881, the statistics for 1878 being excluded from the return as they are available only for 6 months of the year. The figures show that the comparatively healthy months of the year are April, June and July while the unhealthiest are those of October to December.

	<i>Delhi Villages.</i>	<i>Karnal Villages.</i>
January ...	425	231
February ...	345	166
March ...	312	153
April ...	268	118
May ...	315	204
June ...	293	146
July ...	234	141
August ...	290	230
September ...	467	303
October ...	560	298
November ...	631	248
December ...	615	220

The following table shows the deaths registered according to ages in the Delhi and Karnal villages during the period of 3½ years ending in 1881.

	<i>Delhi Villages.</i>	<i>Karnal Villages.</i>
Under one year ...	1,386	606
" 1 to 6 " ...	1,020	568
" 6 to 12 " ...	200	111
" 12 to 20 " ...	259	111
" 20 to 30 " ...	641	212
" 30 to 40 " ...	603	275
" 40 to 50 " ...	763	300
" 50 to 60 " ...	652	285
60 and upward ...	906	426
All ages ... { Males	3,455	1,554
... { Females	2,975	1,340

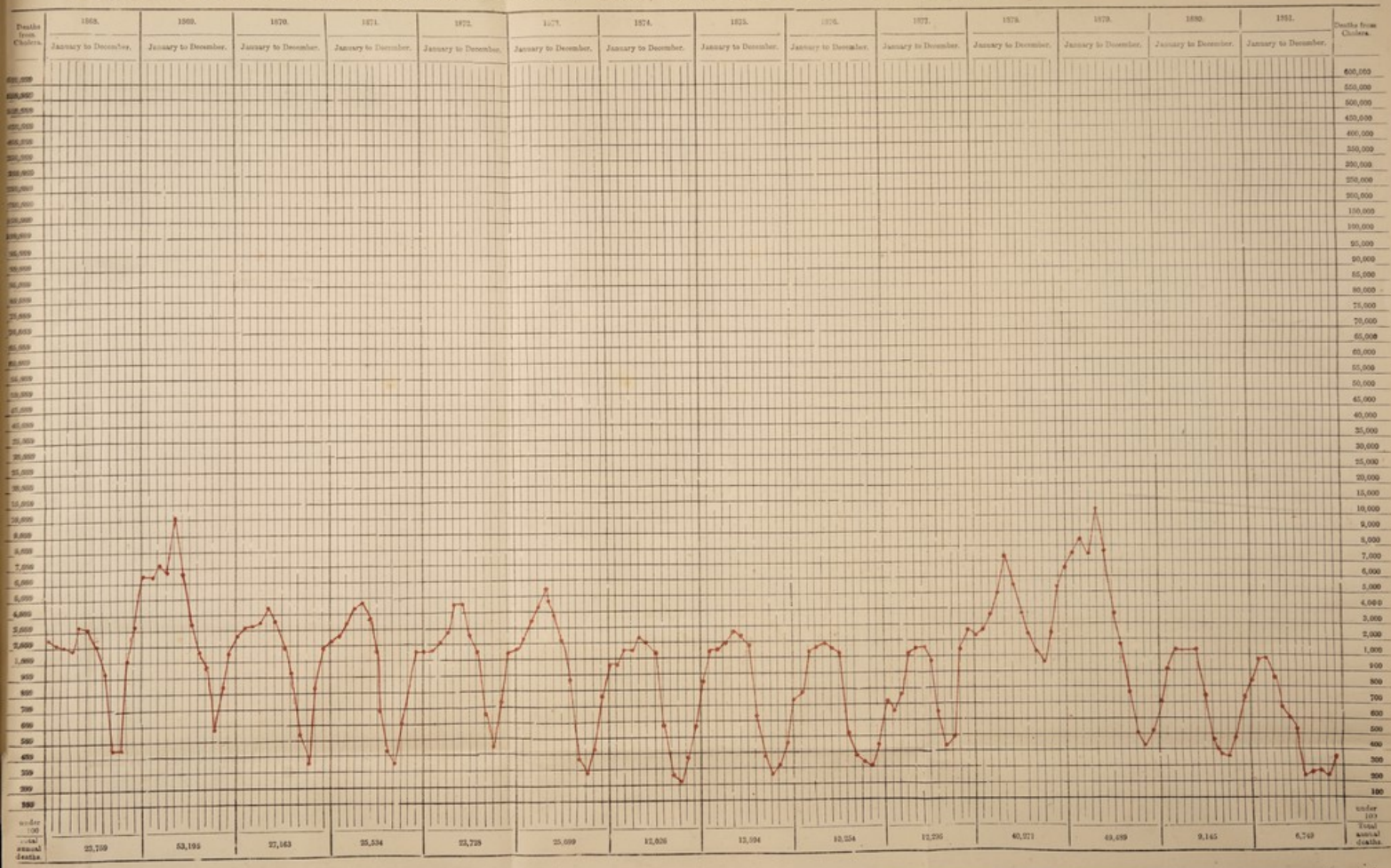
RETURN B.

Deaths registered according to age during the year 1881.

1	2		3					4										13												
								AGES AT DEATH.																						
								Under one year.		1-6.		6-12.		12-20.		20-30.				30-40.		40-50.		50-60.		60 and upwards.		TOTAL.		
DISTRICTS.	BORN DEAD.		Christians.	Muhammadans.	Hindus.	Other classes.	Males.		Females.		Males.		Females.		Males.		Females.		Males.		Females.		Males.		Females.					
	Delhi
Hissar	5	1		
Simla	...	1	2	3	5	5	1	3	16	13
Jullundur	
Amritsar	
Gurdaspur	
Lahore	6	3	6	6	1	1	5	4	8	5	3	4	1	2	1	...	33	24
Gujranwala	3	5	
Rawalpindi	1	1	3	2
Mooltan	1	1	
D. I. Khan	
Total	...	1	2	3	...	...	13	11	9	8	2	1	8	2	11	9	13	8	4	3	2	1	7	5	69	48			

21. The amount realized from fines imposed upon the people for neglect to register births and deaths was Rs. 822. In the two preceding years the amount realized was Rs. 214 and 280 respectively. In the Muzaffargarh district no less than Rs. 595 was realized on this account during the year under review.

CHART SHOWING DEATHS FROM SMALL-POX BY MONTHS IN THE PUNJAB PROVINCE, DURING THE YEARS 1868 to 1881.



SECTION VI.—CHIEF DISEASES OF THE YEAR.

A. CHOLERA.

22. The total deaths registered from Cholera during the year under review were 5,207 of which number 3,036 were males and 2,171 females, or in the ratio of 0.30 per mille per annum of population. In para 22 of my report of last year I stated that "though the disease was present throughout the year it remained in an almost entirely quiescent state till July after which it manifested some signs of activity;" the same remarks do not apply to this year. In 1881 the disease began to show signs of activity in May or two months earlier than in the past year.

23. The Army Sanitary Commission in para 6 of its memorandum on the Sanitary Administration Report of the Punjab for 1879, observe that "the three earlier months of each year are nearly exempt from cholera, and that the normal increase takes place in April." This is a point worthy of attention and one which is fully borne out by the subjoined statement showing the mortality from cholera during each month of the year from 1867 to 1881 inclusive.

Month.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
January	133	49	18	29	17	12	4	1	4	4	2	1	7	1	3
February	83	26	32	31	14	22	2	1	4	7	2	4	4	3	4
March	296	30	51	16	22	18	4	3	4	2	2	...	2	6	4
April	4,279	43	76	33	46	98	10	12	10	6	3	...	2,603	9	5
May	8,179	63	144	53	46	1,073	11	9	41	8	7	...	9,184	7	37
June	8,461	60	194	87	50	978	14	10	316	236	3	2	7,085	15	178
July	8,457	44	797	52	26	489	28	6	747	1,096	2	32	3,457	8	183
August	7,123	39	3,238	43	21	2,859	4	11	1,515	1,396	1	70	2,705	33	1,649
September	4,525	42	2,391	48	20	2,424	50	16	2,117	1,421	4	70	914	14	2,560
October	1,243	90	2,033	22	18	660	17	3	1,358	1,277	1	8	147	120	545
November	321	26	204	24	38	92	2	4	129	280	2	27	7	55	38
December	46	20	80	31	51	2	2	2	1	3	...	1	20	3	1
Total	43,146	532	9,258	469	369	8,727	148	78	6,246	5,736	29	215	26,135	274	5,207

It will be seen therefrom that in epidemic or non-epidemic seasons cholera has a tendency to develop itself with greater activity from the month of April and to prevail with more or less virulence in certain parts of the Province up to the end of October and that it then subsides or almost entirely disappears in the cold weather months commencing from November and ending with March.

24. In 1881 cholera deaths were registered in 371 localities, out of a total of 34,973 in the Province as will be seen from the statement attached to the Cholera map which is appended to this section of the report.

The localities affected by cholera during 1881, vide Cholera map.

25. The disease was chiefly confined to the districts in the Eastern circle of the Province. Before, however, narrating the history of the outbreak in each of the several affected districts, it is well to note here that in the beginning of October a Special Cholera Committee was appointed under the orders of the Government of India, No. 199—202, dated 19th September 1881, consisting of the following officers:—

COL. C. H. HALL, Commissioner, Rawalpindi	...	... President;
LIEUT.-COL. STEVENS, Rifle Brigade	...	... } Members;
MAJOR KING HARMAN, D. A. Q. M. G.	...	... }
SURGEON-MAJOR H. W. BELLEW, C. S. I.	...	... Member and Secretary;

to enquire into the recent prevalence of Cholera in the Punjab. A copy of the Government of India's order is herewith appended, from which it will be seen that the special attention of the Committee was directed not only to an enquiry into the history of Cholera in the Punjab; but also that of the history of Cholera in India including both the general population and that of troops.

Copy of No. 199-202, dated Simla, 19th September 1881.

From—A. MACKENZIE, Esq., C.S., Officiating Secretary to the Government of India,
To—The President and Members of the Special Committee on Cholera in the Punjab.

Home Department.
Sanitary.

GENTLEMEN,

HIS EXCELLENCY the Governor General in Council having appointed you a Special Committee to inquire into the recent prevalence of cholera in certain parts of the Punjab, I am directed to communicate the following instructions for your guidance.

2. It will rest with you to determine the particular places to which your inquiries should extend. So far as is yet known, the stations which chiefly claim attention are Lahore, Murree, Delhi, Umballa, Jullundur, and Sialkot. These may be taken as fairly illustrative of the different climates of the Province. In nearly all of them there is a city of considerable size, with an important cantonment in its vicinity; and in two of them the circumstances are particularly favourable for investigation, as, while the people in the city have suffered severely, the troops in the adjoining cantonment have either suffered very little, or have been altogether free from attack. The experience of the next few weeks may, however, render it desirable that other cities and cantonments should also be included.

3. It is important that you should, in the first place, make yourselves fully acquainted with the facts; which may be conveniently classed under two main heads, viz., those concerning the general population, and those concerning the troops.

4. As regards the general population, the following points may be noted, as deserving of special attention:—

- (a) The history of cholera in India, and especially in the Punjab, during the last few years.
- (b) Details of its history in the Lahore and other districts to which your special inquiries may extend. The date on which the first case appeared during the year. The circumstances connected with the appearance of the first case and with the subsequent progress of the disease. The number of towns and villages attacked. The number that escaped and the relative proportion between the two. The distribution of the disease by localities and by time as shown by the daily number of attacks. The relation which existed between the rise and fall of the outbreak in adjoining places, including cantonments.
- (c) The circumstances connected with the rise, subsidence, and disappearance of the disease in any place, or in different parts of the same place; as also those connected with the escape or comparative exemption of other places in the neighbourhood. Under this head the sanitary or other local conditions of the places which suffered, and especially of those which suffered much, call for most careful investigation. Among the more important of these conditions may be mentioned drainage, conservancy, water-supply, food, clothing, and the degree of overcrowding, if any existed. Where a severe outbreak was clearly associated with marked insanitary conditions, the state of such places should be compared with the state of those which either suffered little or altogether escaped. The differences should be noted, and an endeavour made to ascertain what degree of correspondence existed between insanitary conditions and the relative intensity of the disease.
- (d) Endeavour should also be made to ascertain what were the exact meteorological phenomena of the year,—whether they presented any peculiarity, and whether this peculiarity appears to have had any relation to the outbreak.

5. In inquiring into the experience of the troops, the same line of investigation as has been above sketched with regard to the general population should be followed; but here the facts can be more easily ascertained, and there are a few special points which deserve attention.

- (e) The previous history of the individual regiments.
- (f) The extent to which the several corps in the garrison and the several bazaars suffered.
- (g) Any peculiarities in the various bodies of troops or other people affected which may account for the differences in the extent to which they suffered.
- (h) The effect of movement into camp as regards cholera, with any note of the results to which the facts seem to point.
- (j) The history of the disease in the vicinity of the camps both before and after the arrival of the troops.
- (k) The effect of movement on the general health of the troops.
- (l) Any apparent errors or defects in the management of the troops in connection with the outbreak.

6. The foregoing is a sketch of the general line which the investigation should take. In the course of your inquiry many other matters will no doubt suggest themselves.

7. Having carefully examined and recorded all the facts, so far as they can be learned, it will be for your Committee to draw the general conclusions which these facts appear to warrant. In this part of the proceedings it is important that you should bear in mind that the object which the Government has in view is of a purely practical character. Mere theoretical discussions and quotations from works on cholera are not desired. Whatever conclusions are advanced should be based on the facts adduced; every such conclusion should be carefully framed, the evidence which appears opposed to it being weighed and recorded as fully as the evidence in its favour. The Government is well aware that the inquiry is beset with great difficulties, and it is important that these difficulties should be fully realised. It is very desirable that definite conclusions should be arrived at, as far as possible; but whenever the evidence is insufficient, or of so contradictory a character that no sound conclusion can be based on it, this should be clearly stated.

8. In the last place, the Committee should make such recommendations as seem best to them for the prevention of the disease in future years, both among the people generally and among the troops, and for the mitigation of outbreaks when they occur.

9. The report should be as concise as possible. It may be advisable to illustrate the incidence of the epidemic in particular districts by means of charts; but these should take the form rather of rough diagrams than of maps, in the preparation of which there must be delay.

10. In conclusion, I am to add that the Committee are empowered to examine all staff, regimental, medical, engineer or other officers, civil and military, from whom they may desire to obtain information. The evidence of all persons examined should be recorded.

I have the honour to be,

GENTLEMEN,

Your most obedient servant,

A. MACKENZIE,

Offg. Secretary to the Government of India.

The report of the Committee is still under preparation, but all that need be mentioned here is that, sufficient facts have been accumulated from all parts of India to enable us to see more of those conditions which favor the development of cholera in India. The numerous statements and charts attached to the report conclusively prove that cholera has its special laws which guide and govern its existence and prevalence and that these laws or conditions are not identical in all parts of India; but are evidently entirely influenced by the conditions of climate and locality.

26. I annex herewith for the sake of comparison a statement showing the mortality from cholera and the record of principal atmospheric changes in the Punjab during 1880 and 1881.

Statement showing the mortality from cholera and the record of principal atmospheric changes in the Punjab during 1880 and 1881.

Month.	1880.					1881.				
	Cholera Deaths.	Thermometer's highest maximum.	Thermometer's lowest minimum.	Relative humidity.	Rain-fall.	Cholera Deaths.	Thermometer's highest maximum.	Thermometer's lowest minimum.	Relative humidity.	Rain-fall.
January	1	75.1	33.3	49	0.42	3	72.1	31.1	44	0.08
February	3	76.0	32.7	50	1.52	4	78.0	36.6	45	1.2
March	6	98.8	43.7	35	0.1	4	85.8	40.8	52	2.4
April	9	104.9	57.6	30	0.12	5	95.6	52.6	42	1.5
May	7	108.2	64.3	32	1.37	37	107.5	54.2	35	0.7
June	15	113.4	69.4	40	3.44	178	108.5	67.6	44	2.9
July	8	100.98	66.2	63	10.11	183	104.1	66.5	60	8.6
August	33	101.1	69.4	56	3.38	1,649	96.9	68.6	71	7.4
September	14	99.7	61.7	52	3.05	2,560	96.4	63.0	56	1.3
October	120	95.3	52.2	36	0.02	545	92.7	49.2	40	0.2
November	55	86.3	37.4	45	0.05	38	83.1	36.6	37	0
December	3	74.3	35.9	55	0.88	1	75.1	33.6	42	0.09

The relation between the aggregate rain-fall and cholera mortality by quarters is very interesting. In the first quarter the rain-fall was 3.75 inches, the deaths from cholera only 11; in the second quarter the rain-fall was 5.13, and the deaths from cholera 210; in the 3rd quarter there was an unprecedented fall of rain, viz., 17.30 inches, and with it the cholera mortality rose to 4,392; in the last quarter the rain-fall fell to 0.25 inches, and the mortality from cholera also declined to 584.

Statement showing mortality from cholera in the several districts of the Province.

27. The following table shows the deaths registered from cholera in the several districts of the Province during each month of the year 1881.

Number.	DISTRICTS.	Population, Census 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
1	Delhi ...	608,850	...	...	...	...	29	86	47	...	5	...	...	...	167
2	Gurgáon ...	696,646	...	...	...	1	...	3	1	...	...	...	...	...	5
3	Karnál ...	610,927	...	...	...	...	...	2	...	49	74	...	...	...	125
4	Hissar ...	484,681	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Rohtak ...	536,959	1	...	...	...	...	...	...	...	...	...	...	...	1
6	Sirsa ...	210,795	...	...	...	...	...	...	...	1	...	...	...	...	1
7	Umballa ...	1,008,860	...	...	...	...	...	...	3	32	145	31	...	1	212
8	Ludhiáná ...	583,245	...	...	...	...	...	1	1	7	12	...	...	...	21
9	Simla ...	33,594	...	...	...	...	...	...	...	...	...	...	...	...	...
10	Jullundur ...	783,020	...	...	...	...	...	...	...	596	246	23	...	...	865
11	Hoshiárpur ...	938,890	...	...	...	...	1	...	...	27	246	56	1	...	331
12	Kángra ...	743,758	...	...	1	...	...	24	10	...	1	1	...	...	37
13	Amritsar ...	832,750	...	...	1	2	1	3	4	49	407	232	8	...	707
14	Gurdáspur ...	906,126	1	4	...	...	1	6	...	4	276	39	1	...	332
15	Siálkot ...	994,458	1	...	...	1	...	...	1	6	272	32	...	...	313
16	Lahore ...	775,551	...	...	2	...	2	51	104	818	590	71	5	...	1,643
17	Gujránwála ...	550,576	...	...	...	1	...	1	...	21	221	16	1	...	261
18	Ferozepore ...	533,416	...	...	...	...	...	...	5	...	18	...	...	...	23
19	Rawalpindi ...	699,647	...	...	...	...	...	...	1	10	25	32	22	...	90
20	Jhelum ...	500,988	...	...	...	...	...	...	6	1	3	10	...	...	20
21	Gujrát ...	616,347	...	...	...	...	...	...	...	22	13	...	...	...	35
22	Shahpur ...	368,796	...	...	...	...	...	...	...	1	...	...	...	...	1
23	Mooltan ...	459,765	...	...	...	...	...	...	...	...	...	...	...	...	...
24	Jhang ...	348,027	...	...	...	...	...	...	...	...	...	...	...	...	...
25	Montgomery ...	359,437	...	...	...	...	...	...	...	2	3	...	...	...	5
26	Muzaffargarh ...	295,547	...	...	...	...	...	...	...	...	...	...	...	...	...
27	Dera Ismail Khan	394,864	...	...	...	...	...	...	...	...	...	...	...	...	...
28	Dera Gházi Khan	309,978	...	...	...	...	...	...	...	...	...	...	...	...	...
29	Bannu ...	287,547	...	...	...	...	...	...	...	...	...	...	...	...	...
30	Pesháwar ...	500,443	...	...	...	...	...	1	...	...	1	1	...	...	3
31	Hazára ...	367,218	...	...	...	...	...	...	...	...	2	1	...	...	3
32	Kohát ...	145,419	...	...	...	...	3	...	...	3	...	...	...	...	6
	TOTAL ...	17,487,125	3	4	4	5	37	178	183	1,649	2,560	545	38	1	5,207

From an examination of the above table it will be seen that eight districts, *viz.*, those noted in the margin have been entirely free from cholera, and in eight others again there was a mere presence of the disease, the registered mortality from this cause having ranged in them from one to six. Thus in Rohtak, Sirsa, and Shahpur, only single deaths occurred; in Pesháwar and Hazára 3 deaths in each; Gurgaon and Montgomery 5 each, and in Kohát 6. In the remaining 16 districts of the Province, the epidemic influence of the disease was felt severely in only three, *viz.*, Lahore, Amritsar and Jullundur, and mildly in the other 13.

28. In the first four months of the year 16 deaths were returned under the head of cholera. As these were all isolated cases, the usual enquiry as to the genuineness of each was made and with the results shown in the annexed statement. As explained, however, in my Sanitary Report for 1877, para 39, I am content to accept the first reports as more correct than the amended ones.

Particulars of the first cases of cholera registered during the first four months of the year.

Particulars of the first cases of Cholera registered in the Mortuary Returns during the first four months of the year.

Month and date of death.	District.	Town or Village.	Date of report to Police Station.	Age.	Duration of illness.	Resident or non-resident.	Result of further enquiry.
January 5th	Siálkot ...	Bhopalwala	V. 5th Jany.,	22 years,	5 days ...	No information,	Bad fever.
" 12th	Rohtak ...	Rohtak	T. 12th "	46 "	9 " ...	" ...	Chest disease.
" 19th	Gurdáspur,	Fatehgarh	T. 20th "	22 "	1 day ...	Resident ...	Cholera.
" 27th	"	Ghanuki	V. 1st Feby.,	40 "	3 days ...	" ...	"
" 30th	"	Madupur	V. 3rd "	10 "	4 " ...	" ...	Chest disease.
" 31st	"	Dera Nának	T. 1st "	40 "	1 day ...	" ...	Fever and diarrhoea.
Feby. 28th	"	Sukhuckack	V. 28th "	25 "	3 days ...	Traveller ...	Committed suicide by poison.
March 6th	Lahore ...	Lahore	T. 7th March,	7 "	1 day ...	No information,	Fever.
" 15th	" ...	Targarh	V. 19th "	35 "	1 " ...	Traveller, Police Constable.	Cholera.
" 26th	Kángra ...	Sidpur Garkari	V. 28th "	3 mths.	4 days ...	No information,	Other causes,
" 28th	Amritsar ...	Kathania	V. 4th April,	45 years.	7 " ...	" ...	Colic.
" 29th	" ...	Amritsar	T. 29th March,	10 "	18 hours ...	" ...	Cholera.
" 29th	Gujránwála,	Chandali	V. 3rd April,	10 "	4 months,	Resident ...	Other causes.
April 6th	Amritsar ...	Dispensary	... 6th "	35 "	1 day ...	No information,	"
" 11th	Gurgaon ...	Narainpur	V. 16th "	27 "	8 days ...	" ...	Diarrhoea.
" 12th	Siálkot ...	Showala	V. 12th "	65 "	2 " ...	" ...	Cholera.

29. The first intimation of the outbreak of cholera in an epidemic form was received on 4th of

Outbreak of cholera in the village of Khundin, Pergannah Pinjore in the Native State of Pattiala, on 4th May—the first intimation received. May, from Surgeon-Major J. Skeen, Medical Adviser to the Maharajah of Pattiala. It occurred in the village of Khundin, Pergannah Dhartee Pinjore in the Native State of Pattiala. The following are the particulars as furnished by Dr. Skeen :

" On the 4th May I received a letter from the thanadar of Pinjore to the effect that the lambardars of Benadur (a village near Khundin) had brought him information that two or three men had died on or about the 2nd May of cholera in Khundin after an illness of from twelve to twenty-four hours, duration. Upon hearing this the thanadar promptly ordered the lambardar to see that no intercourse took place between the infected locality and the neighbouring villages and sent off at once for medical assistance to the State Dispensary at Bunnur.

I now wrote to the Native Doctor, Bunnur (Thakar Das) and gave him such directions as I thought necessary, especially urging him to carefully enquire into and ascertain the real nature of the outbreak. And on the 9th May I received his report which stated that on his arrival at Khundin he found that all the inhabitants, save one old man, had fled into the jungle in various directions and that it was with much difficulty he prevailed upon one of the lambardars named Chanchlu (who had been one of the sufferers) to return. Shortly after this a young child and a boy of ten years of age, who were taken ill of the disease in the jungle, were brought in for treatment by their relatives. The child recovered but the boy died, upon which those who had come in again deserted the village and up to the 9th May when the Native Doctor left, not one of them had returned nor had any information been received regarding them.

'Chanchlu,' the Lambardar, told the Native Doctor that the outbreak commenced on the 2nd May and that up to 7th idem ten (10) deaths had occurred, and the Native Doctor states that the cases he saw were undoubted cases of cholera.

The thanadar of Pinjore and the Native Doctor both state that the disease first attacked two men who had just returned from Hardwar whither they had gone to perform the usual Hindu ceremonies; but they do not state how long they had returned before being attacked. Both are however agreed that these were the first two cases, and the thanadar states that up to the time the people fled not a day passed on which some deaths did not occur: the total being, so far as he could make out, thirteen (13) in all.

The water supply was obtained from shallow wells, dug in the bed of a Nallah about 50 yards distant from the village which at this season was nearly, if not quite, dry. The neighbourhood of the Nallah is said to have been clean, but the village itself was exceedingly dirty, filth of all kinds lying in heaps in front of every door, the stench from which was most offensive.

These are the main particulars of the outbreak. None of the neighbouring villages were affected, and no cases occurred after the 9th May among the villagers of Khundin so far as can be learnt.

I may here add that the localization and the sudden cessation of the outbreak was probably in a great measure due to the custom which prevails among these hill villagers of deserting their homes and camping out in the jungle whenever either cholera or small-pox makes its appearance among them, their admission to other villages being strictly guarded against."

30. But from a report subsequently received from the late Dr. Taylor, Civil Surgeon of Delhi, it appears that cholera appeared in the Delhi district even before the outbreak at Pinjore in the Native State of Pattiála, as will be seen from the following particulars given by that officer in his letter No. 249C, dated 8th June 1881, to the address of the Deputy Commissioner of the Delhi district.

"With reference to No. 38, dated 1st June 1881, from Secretary to Government, Punjab regarding the cases of cholera in the Delhi district. I have the honor to state that the first known and authenticated case of cholera was in the person of a servant of one of the officers of the Garrison in the Fort. The man had been to a *mela* near the Jumma Musjid on the 25th April at night and was found to have cholera on the morning of the 26th. He died that day.

With these preparatory remarks I proceed to describe the circumstances connected with the history, progress, and fatality of the disease in each of the affected districts as furnished to me by the several Civil Surgeons.

History of the outbreak in the Delhi district.

31. The subjoined statement shows, the diffusion of the disease chronologically and locally in the Delhi district.

DELHI DISTRICT.

Statement showing deaths from Cholera in the Delhi district during each month of the year 1881.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Delhi	Delhi	115,992	28th May					2	5	3						10	14th July.	
2	Do.	Suburbs	44,561	12th "					21	39	8						68	7th "	
3	Paharganj	Behipur	481	1st June					1								1	1st June.	
4	Do.	Bazidpur	978	16th "					18	2							20	30th "	
5	Do.	Rabasna	1,129	4th July					2								3	9th July.	
6	Allipur	Tahopur	300	6th "						30							30	13th "	
7	Do.	Janti Kalan	1,541	11th June					3								3	13th June.	
8	Najafgarh	Esapur	1,021	13th "					12								12	18th "	
9	Do.	Mandelah Kalan	406	23rd "					1								1	23rd "	
10	Sonepat	Sonepat	13,637	10th "					1	1							2	3rd July	
11	Do.	Jia Olia	680	10th "					6								6	14th June.	
12	Ray	Fazalpur	439	14th Sept.									5				5	21st Sept.	
13	Larsoli	Kanara	1,259	9th May					6								6	15th May	
TOTAL									29	86	47		5				167		

From the above table it will be seen that 167 deaths were registered in this district in 13 different localities, out of a total of 743 in the district and that the disease prevailed epidemically for three months of the year, that is from May to July.

The following information in reference to the outbreak of the disease, which was not severe in its incidence, is given from the report of the Civil Surgeon, the late Dr. Adam Taylor.

"On the 6th May cholera appeared at the village of Kurar near Sonepat close to the Grand Trunk Road. Up to the 15th May 8 cases occurred of which 6 were fatal. On the 8th May 3 cases, all fatal, occurred in the Sabzi-mandi "Mugalpura," 2 Muhammadans and 1 Bania; the Bania was seen by the Assistant Surgeon. Nothing could be found out about these cases further than that they were undoubtedly cholera, nor could their occurrence be accounted for, satisfactorily.

"On the 16th May a report reached me that a marriage feast had been given among Chamars at Bazidpur a village about 15 miles off on the Western Jamna Canal and that cholera had broken out among the people assembled. I immediately went down and found that about 20 Chamars from Mugalpura had gone to Bazidpur to the marriage on the 15th, had partaken of the feast on that evening and had all bathed in the Canal the morning of the 16th, when cholera seized 3 of them who were put into a cart and carried home; they all died, as also a 4th taken ill on the way; the returning party was stopped outside Delhi and the dead disposed of, but some members of it got into Mugalpura, and two more of them were taken ill there after their return.

On the 18th the principal outbreak took place, 11 cases including two of those mentioned in preceding paragraph, were detected by myself in Mugalpura.

From 19th May to 7th June inclusive 32 cases occurred, of which number 19 recovered and only 13 died.

The cases were almost all seen by myself. They were undoubtedly cholera, most of those which were detected early and treated, recovered; two-thirds recovered of those treated, though some were in the last stage. The cholera does not seem of an unusually severe type, and although the percentage of deaths among the cases not under treatment is high, 15 out of 17, it must be remembered that probably almost the only cases that were heard of were the fatal ones which could not be concealed.

It is a remarkable fact that though cases have occurred here and there in other parts of Delh the disease has shown hitherto no tendency to spread or to stick to the localities in which it cropped up.

Two faqirs died in a "Takia" outside the Turkman gate, the first man went to Mugalpura the day before he died, 19th May, and ate food there; the second man who lived in the same house was taken ill on the 21st and died on the 22nd, he was not seen by me till after death; but there was no doubt of the case.

Besides these two a servant of an officer in the Fort died near the Kashmiri gate on the 27th May, and a boy belonging to the Mission School died on the 2nd June in Sher Khana. A chaukidár belonging to Telewarah died on the 28th after having gone to a feast the night before in the Sadr Bazár, and a boy forming one of a marriage procession from a village called Kankar Khera was taken ill (seen by myself) on the 3rd June and recovered.

The only other case known to me was that of a merchant from Bikaner, "who arrived in Sadr Bazár on the 2nd, was taken ill on the 5th and died in the Hospital on the 7th."

LAHORE DISTRICT.

History of the outbreak in the district of Lahore.

32. The following statement shows the diffusion of the disease chronologically and locally in the Lahore district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Lahore	Lahore ... T.	92,035	6th March	...	1	...	12	20	499	237	2	...	...	772	19th Octr	
2	Ditto	Bagbanpurah ...	3,212	7th Augt.	...	...	...	...	...	24	3	...	...	...	27	13th Sept.	
3	Ditto	Bhogiwal ...	1,042	19th do.	...	...	...	...	...	2	1	...	...	...	10	16th do.	
4	Anárkalli	Suburbs ...	36,406	9th June	...	...	...	19	33	195	75	4	3	...	329	5th Novr.	
5	Ditto	Nawankote ...	680	10th do.	...	...	...	1	...	3	1	...	...	...	5	2nd Sept.	
6	Ditto	Tsjpur ...	372	11th do.	...	...	...	...	...	...	...	...	...	...	2	12th June	
7	Ditto	Ganj ...	550	22nd do.	...	...	...	6	...	3	...	...	...	...	9	25th Augt.	
8	Ditto	Chung ...	1,200	26th do.	...	...	...	1	...	...	...	...	...	...	1	26th June	
9	Ditto	Ichhra ...	8,400	5th July	...	...	...	...	1	6	3	...	...	...	10	3rd Sept.	
10	Ditto	Sahuwari ...	650	19th do.	...	...	...	2	...	...	...	...	...	...	2	31st July	
11	Ditto	Guru Mangat ...	390	8th Augt.	...	...	...	...	...	1	...	...	...	...	1	8th Augt.	
12	Ditto	Dhup Sari ...	300	17th do.	...	...	...	...	...	4	...	...	...	...	4	28th do.	
13	Ditto	Babu Sabu ...	1,300	18th do.	...	...	...	...	...	3	1	...	...	...	4	31st do.	
14	Ditto	Korah ...	480	21st do.	...	...	...	...	...	1	...	...	...	...	1	21st do.	
15	Ditto	Pakki Thatti ...	2,800	20th do.	...	...	...	...	...	2	...	...	...	...	2	22nd do.	
16	Ditto	Mian Mir ...	290	31st do.	...	...	...	...	...	1	...	...	...	...	1	31st do.	
17	Ditto	Moridwal ...	*	1st Sept.	...	...	...	...	...	...	1	...	...	...	1	1st Sept.	
18	Raiwind	Ladaiki Onche,	605	6th July	...	...	...	...	16	...	...	...	...	...	16	16th July	
19	Ditto	Vatnah ...	475	12th do.	...	...	...	...	1	...	...	...	...	...	1	12th do.	
20	Manánwán	Manánwán ...	1,500	25th June	...	...	...	2	...	...	...	...	...	...	2	25th June	
21	Ditto	Lakho Dher ...	500	21st Augt.	...	...	...	...	...	1	...	...	...	...	1	21st Augt.	
22	Ditto	Mamud Buti ...	200	30th do.	...	...	...	...	...	...	1	...	...	...	1	30th do.	
23	Ditto	Bhangáli ...	400	31st do.	...	...	...	...	...	...	1	...	...	...	1	31st do.	
24	Ditto	Bhasin ...	1,200	12th Sept.	...	...	...	...	...	...	5	...	...	...	5	20th Sept.	
25	Ditto	Kotli Ghási ...	100	29th do.	...	...	...	...	...	...	1	...	...	...	2	30th do.	
26	Ditto	Taijgarh ...	180	6th Octr.	...	...	...	...	...	...	...	3	...	...	3	7th Octr.	
27	Ditto	Mahamdpur ...	298	14th do.	...	...	...	...	...	...	...	1	...	...	1	14th do.	
28	Ditto	Thattáh ...	60	12th do.	...	...	...	...	...	...	...	1	...	...	1	12th do.	
29	Shahdara	Targarh ...	100	15th Mar.	...	1	...	...	...	...	...	...	...	...	1	15th Mar.	
30	Ditto	Kote Begam ...	1,000	14th Augt.	...	...	...	...	...	1	...	...	...	...	1	14th Augt.	
31	Ditto	Gagu Dogar ...	292	27th do.	...	...	...	...	...	...	1	...	...	...	1	27th do.	
32	Ditto	Kote Nathu ...	111	28th do.	...	...	...	...	...	...	1	...	...	...	1	28th do.	
33	Ditto	Talwárah ...	785	24th do.	...	...	...	...	...	12	2	...	...	...	14	1st Sept.	
34	Ditto	Nainsukh ...	395	2nd Sept.	...	...	...	...	...	...	1	...	...	...	1	2nd do.	
35	Ditto	Shahdara ...	2,000	7th do.	...	...	...	...	...	...	3	...	...	...	3	10th do.	
36	Muridke	Muridke (Parao)	140	18th do.	...	...	...	...	...	...	1	...	...	...	1	18th do.	
37	Chung	Alliá Abád ...	*	2nd Augt.	...	...	...	...	...	...	1	...	...	...	1	2nd Augt.	
38	Ditto	Mangah ...	4,765	19th do.	...	...	...	...	...	...	1	...	...	...	1	19th do.	
39	Ditto	Shahpur ...	1,072	22nd do.	...	...	...	...	...	...	1	...	...	...	1	22nd do.	
40	Ditto	Chung ...	1,855	15th Sept.	...	...	...	...	...	...	2	1	...	...	3	26th Sept.	

* Not known.

No.	Police Station.	Town and Village	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
41	Chung	Panjarain	*	25th Sept.									1	1		2	2nd Octr.		
42	Ditto	Khanpur	601	30th do.										1		1	30th Sept.		
43	Kaná Káchha	Galverah	184	27th June												15	3rd July.		
44	Ditto	Ladaiki	359	7th July												3	7th do.		
45	Ditto	Saránch	494	4th Augt.												11	7th Augt.		
46	Ditto	Báhuboli	232	19th do.												2	19th do.		
47	Ditto	Nainipuráh	*	30th do.												7	8th Sept.		
48	Ditto	Kaliki	740	2nd Sept.										3		3	3rd do.		
49	Ditto	Attari	480	11th do.										9		9	24th do.		
50	Ditto	Kamániah	1,023	20th do.										1		1	20th do.		
51	Sharkpur	Sáhd	975	31st Augt.										4		4	2nd do.		
52	Ditto	Fezpur Kalán	2,426	10th Sept.										6		6	17th do.		
53	Mangtanwála	Masu	1,350	29th June							3					3	5th July		
54	Ditto	Jogianwála	150	16th July							1					1	16th do.		
55	Bhay Pheru	Bungá Madar	159	31st Augt.								1				1	31st Augt.		
56	Ditto	Mudki	1,576	22nd Sept.										1		1	22nd Sept.		
57	Ditto	Kánvin	264	20th do.										3		3	23rd do.		
58	Ditto	Jhugian Bolaka Singh.	*	25th do.										2		2	25th do.		
59	Ditto	Bhayá Asal	1,157	5th Octr.											6	6	15th Octr.		
60	Chunian	Chunian T.	6,469	10th May							1			3	5	9	8th do.		
61	Ditto	Van Radharam,	635	21st Augt.								1				1	21st Augt.		
62	Ditto	Van Kharah	856	7th Octr.											1	1	7th Octr.		
63	Ditto	Nosherah	12	12th do.											2	2	13th do.		
64	Ditto	Sahanki Otar	299	21st do.											1	1	21st do.		
65	Ditto	Mahamdipur	463	5th do.											25	25	14th do.		
66	Ditto	Mahla	*	16th do.											1	1	16th do.		
67	Ditto	Gajan Singhwála	*	21st do.											1	1	21st do.		
68	Ditto	Virke Non	254	1st Novr.												2	2	1st Novr.	
69	Kanganpur	Siowal	299	30th June							1					1	30th June		
70	Ditto	Bhobahwála	163	18th July							1					1	18th July		
71	Ditto	Jair	182	5th Sept.										1		1	5th Sept.		
72	Ditto	Attari Aki	276	14th do.											1	1	14th do.		
73	Ditto	Kasur	16,793	10th Augt.								23	75			98	28th do.		
74	Ditto	Khem Karn T.	5,860	4th July							5	1	16	12		34	27th Octr.		
75	Ditto	Burj Kalan	1,354	10th May												1	10th May		
76	Ditto	Kotli Hathar	365	14th Augt.								1				1	14th Augt.		
77	Ditto	Katlahi Kalan,	668	17th do.								2				2	20th do.		
78	Ditto	Kals	403	20th do.								7	4			11	13th Sept.		
79	Ditto	Sahari Hathar,	2,864	31st do.									1			1	31st Augt.		
80	Ditto	Gajal	898	6th Sept.											2	2	14th Sept.		
81	Ditto	Shekh Amad-kunah.	364	8th do.											1	1	8th do.		
82	Ditto	Kharah	438	10th do.											2	2	26th do.		
83	Ditto	Sahari Otar	*	11th do.											1	1	11th do.		
84	Ditto	Sehjah	3,381	13th do.									8			8	20th do.		
85	Ditto	Mahiwála	400	13th do.											2	2	14th do.		
86	Ditto	Rajiwála Kalan,	621	15th do.									13			13	24th do.		
87	Ditto	Phalah	857	9th do.									1			1	9th do.		
88	Ditto	Dohal	160	16th do.											1	1	16th do.		
89	Ditto	Bhaddian Kalan	1,277	17th do.											2	2	27th do.		
90	Ditto	Todipur	694	17th do.											1	1	17th do.		
91	Ditto	Bhorahnon	683	18th do.											1	1	18th do.		
92	Ditto	Bakhivind	209	19th do.											4	4	19th do.		
93	Ditto	Rattoke	389	18th do.											3	3	24th do.		
94	Ditto	Nathuwala	189	21st do.											1	1	21st do.		
95	Ditto	Mianwala	295	22nd do.											1	1	22nd do.		
96	Ditto	Nagar	1,091	23rd do.											1	1	23rd do.		
97	Ditto	Kadivind	379	26th do.											2	1	3	1st Octr.	
98	Ditto	Shekhpurkunah,	493	14th do.											1	1	14th Sept.		
99	Luliani	Dhagal	500	20th July												2	20th July		
100	Ditto	Lel	100	20th do.												7	22nd do.		
101	Ditto	Ri	400	23rd do.								1				7	29th Augt.		
102	Ditto	Bhajah	80	22nd do.												2	23rd do.		
103	Ditto	Luliani	1,000	27th Augt.											6	7	23rd Sept.		
104	Ditto	Orarah	500	27th do.											18	18	11th do.		
105	Ditto	Bhaddian	400	3rd Sept.											2	2	3rd do.		
106	Ditto	Kallian	90	15th do.											6	6	20th do.		
107	Ditto	Daftoh	400	14th do.											2	2	16th do.		
108	Patti	Kachah Pacca	710	14th do.											6	6	20th do.		
109	Khalrah	Opal	357	14th do.											1	1	14th do.		
110	Ditto	Karbath	1,637	21st do.											2	2	21st do.		
111	Valtoha	Lagnah	718	1st do.											2	2	2nd do.		
112	Ditto	Rajoki	1,473	12th do.											1	1	12th do.		
113	Ditto	Chimah	348	17th do.											3	3	19th do.		
114	Ditto	Asal	1,052	18th do.											2	2	19th do.		
115	Ditto	Tut	1,744	17th Sept.											1	1	17th do.		
116	Ditto	Basarke	1,596	22nd do.											3	3	22nd do.		
TOTAL ...							2	251	104	818	590	71	5		1,643				

* Not known.

The total number of cholera deaths registered is 1,643. Out of a total of 1,672 towns and villages

Lahore City	772	in the district, 116 recorded
Anarkalli Suburbs	329	cholera. Of this number the
Kasur T.	98	places noted in the margin re-
Bagwanpura	27	turned the largest number of
Khem Karn T	34	deaths.
Muhamadpur	25	

The following information in regard to the outbreak of the disease in the Lahore city is furnished by Dr. Fairweather, the Civil Surgeon:—

“The first case in the Lahore district occurred in the city of Lahore, but it was a doubtful case. The subject of it was a Banker named Darbara Singh about 65 years of age, who lived in a locality near the Fort, called Syad Mittha. He was not seen alive by any medical man, and he had no friend who could give a proper account of his illness. His death therefore was put down to cholera as he was said to have been taken ill with vomiting and purging on 31st May and to have died on 1st June.

On 5th June the disease broke out in the Cantonment at Meean Meer, where 2 Europeans and 2 Natives were seized. On 6th June 2 young men hearing of the seizure of a friend (Jowinda) on the previous day at Meean Meer went from Lahore city to see him, and both were taken ill with cholera on their return the same night. One of these recovered, the other died.

The next case in the city was that of Ram Devi, the wife of the same Jowinda, who had been seized at Meean Meer, on the 5th and died on the 6th June. She on hearing of her husband's death went to Meean Meer to bring his body back for cremation and was seized herself on the 7th and died on the 8th.

It is not within my province to trace the progress of the disease within the Cantonment of Meean Meer. For the purpose however of giving a connected account of the epidemic, I will merely mention that the disease smouldered there for some days after its first appearance, but then burst out with virulence on the 12th and 13th June.

The fifth case which occurred in the district excluding the Cantonment of Meean Meer, was a woman named Rupkour whose husband was a shop-keeper there. She went from Meean Meer to Nawa Kot, a village near Lahore on the 8th June, was seized there on the same day and died on the 9th.

The sixth case was a religious mendicant in a Hindu temple at Meean Meer where he was seized on the 9th June. He was brought to Lahore on the 10th labouring under the disease, and died there in a house in Hanuman ka kucha.

The seventh case was Ram Chand, a servant in Manack Coppersmith's shop, Meean Meer. He was seized there on 9th, was brought here to his house Kucha Kassarian on 10th and died same day.

The eighth case was Kundan Lal, aged 25 years, employed in Ram Pershad's shop, Anarkalli, between whom and the shop-keepers in Meean Meer there was much communication, in fact it was known he had lately gone to Meean Meer himself on business.

It thus appears that leaving out the doubtful case of Darbara Singh the first 7 cases which occurred in Lahore and its suburbs after the disease had manifested itself in the Cantonment at Meean Meer were closely connected with the outbreak there, and it is impossible therefore not to conclude that the disease was imported in the first place from Meean Meer and spread therefrom. On the 10th and 12th of June 6 cases occurred in Lahore and its suburbs, and of these one (Ganaisha Lal) was the husband of Rupkour (see above, case 5) who hearing of his wife's death at Nawa Kot went there to burn the body and was seized on 12th June but recovered, another was Ishar Das, employed in the Deputy Quarter Master General's Office, Meean Meer, who was seized on the 12th when on a visit to Lahore but recovered.

On 13th June the disease first showed a tendency to become epidemic, and burst out with virulence among the beef butchers occupying a confined dirty part of the suburbs near the Anarkalli Bazar. 24 of these were seized from the 13th to 21st inclusive. The locality was evacuated and it stopped. During this period also other cases (14 or 15 in all) of a dropping nature occurred in different parts of the city and suburbs. The future progress of the epidemic will best be seen by a perusal of the subjoined table showing the daily seizures and deaths within municipal limits. This table is however very incomplete, for 424 deaths from the disease were afterwards found out which were not recorded at the time, and if so many deaths escaped notice, it is evident that at least about an equal number of recoveries must have escaped registration. The figures given therefore do not nearly represent the extent to which the disease prevailed. It is the severest epidemic that has visited Lahore since 1856 and the cause of its severity might have been attributed to the very insanitary state of the city which has already been alluded to, were it not that the disease proved equally virulent at Meean Meer where, as far as I know, no such insanitary conditions prevailed.

Table showing daily seizures and deaths of Cholera.

Date.	June.		July.		August.		September.		October.	
	Seizures.	Deaths.	Seizures.	Deaths.	Seizures.	Deaths.	Seizures.	Deaths.	Seizures.	Deaths.
1	1	1	..	1	4	2	27	21	..	..
2	..	..	3	1	3	2	25	17	..	..
3	..	..	8	6	12	9	29	22	..	..
4	..	..	2	..	5	3	30	22	..	..
5	1	..	5	1	10	3	21	14	..	..
6	2	2	2	2	24	11	19	11	..	..
7	1	..	..	..	17	10	14	18	..	..
8	1	1	6	3	27	22	14	8	..	..
9	3	1	..	..	40	30	21	10	..	..
10	2	4	1	..	20	10	15	10	..	..
11	1	1	1	..	43	30	12	9	..	..
12	3	1	2	1	24	10	15	8	..	..
13	..	..	2	..	42	25	11	8	..	..
14	4	2	1	..	32	15	16	12	..	..
15	3	3	..	..	57	38	6	1	..	..
16	3	1	2	2	55	31	2	1	2	2
17	1	1	2	..	55	41	1	1	4	3
18	6	3	4	1	57	41	..	3	..	1
19	14	4	1	1	42	31	3	..	..	..
20	1	1	3	..	61	40	6	..	..	..
21	9	5	..	..	49	33	2	..	..	..
22	3	2	2	..	56	39	..	..	..	..
23	14	9	2	2	40	28	..	..	..	..
24	8	5	5	6	44	29	..	..	..	..
25	2	1	6	4	55	35	1	..	..	..
26	4	2	9	5	30	20	..	..	..	..
27	4	4	7	3	21	20	..	..	..	..
28	2	1	7	5	34	22	..	..	..	..
29	3	2	3	1	37	24	..	..	..	..
30	4	2	4	1	30	22	..	..	..	..
31	..	..	6	2	33	23	..	..	..	..
Total ...	100	59	96	48	1,059	699	290	196	6	6

To these deaths have to be added the 424 afterwards found out making a total of 1,432. From the above table it will be seen that the disease made little progress in June and July that it rapidly increased during the first week of August and attained its maximum about the 20th of that month after which it rapidly declined and was almost extinct soon after the middle of September although a few isolated cases occurred in October and even, according to the Police reports, in November.

With the exception of the outbreak among the beef butchers the disease did not burst out epidemically anywhere. It seemed to be pretty equally distributed all over the town and its suburbs. It attacked Europeans as well as Natives. The Railway employes suffered severely. It lurked in the Lunatic Asylum from July till September every now and then carrying off one of the inmates, but never blazing up into a general epidemic. It stuck so persistently to the Fort, notwithstanding the frequent changes in the European detachment there, that at last it had to be evacuated by the European troops altogether for a time. It attacked the Jail in August and carried off 90 of the prisoners. It gradually spread from Lahore and Meean Meer into the surrounding villages where it lingered for many weeks after it had almost died out in Lahore. The Cantonment of Meean Meer retained the disease till late in November and every attempt to bring back the European troops from their encampment was followed by a fresh outbreak.

History of the first cases of Cholera that occurred in the Lahore Central Jail in August 1881, as mentioned by Dr. DICKSON, the Superintendent of the Jail, in his report, dated 10th September 1881.

33. On Friday, the 5th of August 2 "Barkandazes" and 2 night watchmen were taken ill, all these men belonged to a village "Bhundpura" adjoining Mozang, a large village near the Jail. I saw one of these men in a hut in the Ice-field where he died at 5 p. m. In this case it is remarkable that the men had fasted all the pre-

History of outbreak in the Lahore Central Jail.

vious day as is the custom with Mussalmáns during the month of Ramzán, and that his illness was attributed to his having partaken of a large meal of grain (dál) with his wife and child both of whom were ill. He certainly suffered most acutely from pain in the abdomen which may have been due to the undigested grain. The next day 14 cases of cholera were reported by the Police in this village of Bhundpura.

The other Barkandaz I also saw, he was on duty at the gate of the new Solitary Cell Compound in the Jail, and complaining of being ill, I let him go to his house at about 10 a. m. The man's night duty was the previous night in the Hospital, his name was Abdul Rahim—he also died. The 2 night watchmen I believe recovered, one went to Jullundur, they were both on duty the previous night at each corner of the Hospital compound but not in it.

The next case was (1) a prisoner Basawa Singh, umbrella-bearer to the Assistant Surgeon—he lived in the Hospital compound, but was a good deal of his time outside the Jail. He was taken ill about 5 p. m., on Sunday, the 7th August in the Hospital, where he had gone about an hour previous. It is said that he and another prisoner who lived in the cook-house, had had a meal of *Khír* (rice and milk) together; the other prisoner was never ill. I saw Basawa Singh at 9-30 p. m., and at once sent him to the Cholera Hospital, which had been got ready in anticipation of cases, and there he died. The Hospital ward was emptied, scraped, and the Hospital gate locked to prevent ingress and egress. On Monday, the 8th August I saw a man (prisoner No. 2) Gholam Shah, who complained of severe purging in Ward No. 1, he was sent at once to the Cholera Hospital and had no further symptoms till the 11th, when the purging returned and he died. I have called this case the second case of cholera, but it is quite an open question, and the man may have died of simple diarrhoea.

The men who took these men to the Cholera Hospital were not allowed to return. There were several prisoners: Uda from hospital, on 8th; Alla Ditta from garden on 9th, and Nathu from Solitary Cells, on 16th, who were also sent to Cholera Hospital; "but I need not say any more about them than that they all recovered and were not in my opinion cases of cholera." After this there was "an interval quite free of cases, that is, from Sunday, the 7th, to Friday. On the 12th August, cholera was severe in the town of Lahore; and I was afraid lest the large number of Press employés coming daily from the town to work in the Press might bring sickness with them, so they were paraded daily before going into the Jail, and inspected by me.

I have made careful enquiries about these men. One Ali Baksh had died, on Wednesday, the 10th August, and his father Abdulla still comes to the Press, it is said too that several of the employés had relatives ill with cholera at the time in the town, for instance one Beli Ram, but the men themselves were all well and none of them taken ill in the Press.

On Friday, the 12th at 5 p. m., a Press prisoner was taken ill with cholera and at once sent to Cholera Hospital, this man's name was (3) Dureh Khan (he ultimately recovered and I was able to question him about the Press employés); he slept in Ward No. 15, a Ward which furnished no cases till the prisoners had been some time in camp (August 22nd). About 2 a. m. 13th August, another Press prisoner (4) Mehndi Shah was taken ill and at once sent off. He slept in Ward No. 2, and I locked up his barrack and stopped all ingress and egress from No. 2. The same morning, 13th August an old life-prisoner (5) Habib Shah, who slept in the same room with Mehndi Shah but who worked only in the Ward No. 2 was taken ill and died in the Cholera Hospital. This seems, to indicate his being infected by Mehndi Shah, and the case I think throws some light on the spread of the disease. It will also be noticed how the disease kept at first to the first circle, that is to Wards numbered from 1 to 8 and it was from this circle that almost all the Press prisoners were supplied. The last case was on the 13th August, Ahmed Shah from No. 7 where he worked as a carpet "Nagshi", I cannot guess how he became infected, except that being a useful prisoner he might have been out of his ward; his case was very severe and he ultimately died.

On the 14th August there was one case, and from that day it became impossible to say from which quarter to expect cases.

On the 15th August a move was made into camp, 431 prisoners were sent out, on that day and on Tuesday, the 16th the great mass of the prisoners were sent out, on that night there were 1,550 prisoners in camp and about 450 left in the Jail. Altogether there were 125 cases and 90 deaths in the Jail and camp from 7th to 30th August.

The epidemic ceased suddenly on Tuesday, the 30th August, after a very heavy storm of wind and rain, the wind which had previously been in the East going round to the West, and Lahore which had during this rainy season presented the appearance of almost a swamp from continued rain returned to its normal condition of drought and dustiness. There is one remarkable feature about the epidemic, that the Central Jail prisoners were alone effected (with the sole exception of the juveniles who occupied a separate ward). How the establishment escaped I cannot say, for I had the greatest difficulty in preventing the Jamadars of the wards from sleeping among the prisoners."

KANGRA DISTRICT.

History of outbreak in the Kangra district.

34. The diffusion of the disease chronologically and locally is shown in the following statement.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.	
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.				
1	Palampur	Sidhpur	524	26th Mar.			1										1	26th Mar.		
2	Do.	Dadah Opurla,	147	3rd June						5							5	7th June.		
3	Do.	Dadah	678	9th "						5							5	13th "		
4	Do.	Pathhar	2,039	10th "						6	1						7	2nd July.		
5	Do.	Nagrota	1,803	13th "						1							1	13th June.		
6	Do.	Alwari	563	12th "						1	1						2	1st July.		
7	Do.	Bhabri	814	16th "						2							2	18th June.		
8	Do.	Palothah	381	17th "						1							1	17th "		
9	Do.	Barvar	876	21st "						1							1	21st "		
10	Do.	Samulah	608	21st "						1							1	21st "		
11	Do.	Bhawas	1,491	24th "						1							1	24th "		
12	Do.	Bairalah	2,190	3rd July							1						1	3rd July.		
13	Do.	Dandoli	919	9th "							3						3	13th "		
14	Do.	Bair		25th "							3						3	25th "		
15	Dharmsala T.	Dharmsala T.	2,862	29th "						1							1	29th "		
16	Nurpur	Nurpur T.	7,337	25th Sept.								1					1	25th Sept.		
17	Sorwan	Kandran	1,146	27th Octr.									1				1	27th Octr.		
Total							1			24	10			1	1					37

The total number of cholera deaths registered is 37, out of a total of 709 towns and villages in the district, altogether 17 recorded cholera; 10 of this number registered only single deaths, 2 others only 2 each, 2 others only 3 each, 2 others 5 each, and the remaining 1 registered 7 deaths. The first death registered from cholera in this district occurred at the village of Sidhpur, population 524, in Palampur Circle, on the 26th March, it was an isolated case. The last case was registered on the 27th October, at the village of Kandran, population 1,146, Sarwan Police Circle, it was also an isolated case. With the exception of 1 death in the Nurpur Circle and 1 in the Dharmsala Circle, all the other deaths were registered in the Palampur Circle, between the 26th March and 29th July. The largest number of deaths 7, was reported from Pathhar population 2,039, the first on 10th June, the last on 2nd July, and from the neighbouring villages of Dadah, Upper and Lower each of which returned 5 deaths. Regarding the outbreak in these villages the following details are derived from the report of Dr. Young, Civil Surgeon.

The first case occurred on the 3rd June in the village of Upper Dadah, population 147, which is quite isolated and lies about 2 miles of the main road and about half way between Dharmsala and Palampur. A stream of irrigation water of considerable volumes, very rapid, which comes from the Badir higher up, was through the village Southwards by Pathhar, becoming gradually divided among the rice fields. The history of the outbreak at Upper Dadah, where the disease was very violent carrying off all the inmates of a group of houses occupied by tanners, with the exception of one man and two children is as follows:—

The 1st case on the 3rd June was that of man aged 51, who went to his fields as usual after breakfast, telling his sister to bring his mid-day meal. She went to him and found him ill, suffering from cramps in his arms and legs. She had him brought home, where vomiting and purging set in the ejecta being like rice water. He died in the evening. The 2nd case was the sister of the first. She took ill on the 4th, and recovered. The 3rd case occurred on the 5th, on the person of a man aged 60, who assisted in bringing No. 1 home. He took ill in the fields, went home and slept, on awaking purging and vomiting set in; he died the same evening. The 4th case, was that of the son of the preceding, aged 35. He helped to rub his father's limbs, was seized on the 5th and died in collapse on the 6th. The 5th case was brother of the preceding, aged 25. He took ill on the 6th and died next day. The 6th case was another brother of the two preceding, aged 6. He took ill on the 7th and died the same day. The 7th case was that of a boy, aged 3, son of No. 4. He took ill on the 8th and died next day. The 8th case was that of the wife of No. 4, aged 23. She took ill on the 9th and died on the 10th. The 9th case was that of another brother aged 30 of the Nos. 3 and 4, and son of No. 2, he took ill on the 9th and died on 12th. The 10th case was that of a daughter, aged 25, of No. 2, and sister of No. 3, 4, and 8. She took ill on the 11th and died on the 13th. With the exception of the first 2 cases all the others were tanners by caste and lived in 3 houses quite close together. In one of these houses a quantity of hides were kept, and when the first 3 of their people died the others shut up their home and lived in the open verandah. The house occupied by the first case of all was about 200 yards from where the others

of Hoshiarpur but was undergoing his sentence of imprisonment in the Jullundur Jail, and at that time cholera was prevalent in the Jullundur city in an epidemic form. The man was released that morning (14th) from Jail, and came direct to Hoshiarpur, was seized with symptoms, (it is said that he first took ill on the way) of cholera at 10-6 a. m., and died at 9 p. m. On the 20th 2 more cases occurred in the town (one in the same part of the town, where the first case had expired), both these cases had come in from Jullundur about a week before their seizure, and after these cases, cholera assumed an epidemic form in the town, increasing daily and eventually affected the suburbs. The Hospital Register shows no prevalence of diarrhoea before the outbreak, or any other disease, and the aspect of the town and suburbs was, as favorable as could be expected in the month of August. The disease kept fluctuating and was at its height on the 11th September, was steadily on the decline, and again increased in number to the 20th, those cases which occurred from the 17th to the 20th September were of such a virulent nature that most of the cases proved fatal within six hours after seizure. After the latter date, the disease assumed a milder type, fewer in number, and entirely disappeared from the town by the 3rd October. Total seizures 328, deaths 134, deaths to treated per cent 36.18.

A small town situated half a mile East of Hoshiarpur. The first case occurred on the 26th August. The people of this town are in constant communication with Bahadarpur. In this town the largest number of seizures in one day was 5 (11th September), but the disease continued with intervals of cessation up to 12th October, after which date no more cases were reported. Total seizures 23, deaths 12, deaths to treated per cent 52.17.

This is also a small town lying 3 miles South-east of Hoshiarpur. The first seizure in this town was on the 27th August and continued to 11th September. This town also is in close communication with Hoshiarpur, and a number of native officials connected with the Katchery, &c., resided here, besides boys who attend the Sadr school. Total seizures 14, deaths 3, deaths to treated per cent 21.42.

Another small town situated 2 miles West of Hoshiarpur. The first case occurred in this town on the 31st August. There was a cessation of seven days before the 2nd seizure, and so on, the disease showing itself at intervals to the end of September when seizures became a daily occurrence, and on the 5th October was at its height, there being on that date 14 cases, and on the succeeding 3 days 9, 8 and 8. The town was at once visited by the Civil Surgeon, who says he "found 4 wells, from which water was taken for all purposes, unusable. One well situated in the centre of the town had a large amount of *infusoria*, and the water had a very bad taste and a fetid odour. In the remaining 3 wells the water was hard and alkaline, and in all probability contained in solution a large quantity of calcium or magnesia sulphate. These wells were at once closed, and the disease gradually subsided, and from the 9th to the 19th October the seizures were one and sometimes two daily, but of a very mild type." There is a constant intercourse between this town and that of Hoshiarpur, and a number of the native officials employed in the Katchery live in this town, besides others going to and fro. Total seizures 66, deaths 29, deaths to treated per cent 43.93.

A small village situated half a mile West of Hoshiarpur. In this village which is chiefly composed of weavers the first case occurred on the 1st September and continued "sporadically" to the 21st and entirely disappeared by the 26th September. Total seizures 19, deaths 7, deaths to treated per cent 36.84.

A large village situated half a mile South-west of Hoshiarpur. The first seizure took place in this village on the 7th September. The largest number of cases was on the 2nd day of the attack (9) and from the 16th single cases occurred to the 22nd September and the village was entirely free from the disease by the 26th September. "In this village also the water had the same influence in producing the disease. Three wells were closed, the water of which was not usable owing to the presence of organic matter, and the water disagreeable to the taste. After their disuse, apparently, the disease began to abate, the cases were in daily number less, and of milder type."

In this village also a well was closed, the water of which was considered unfit for consumption, and it was supposed to have given rise to cholera, from the fact of a man who had been suffering from cholera being found lying on a bed within two yards of the well. Total seizures 23, deaths 8, deaths to treated per cent 34.78.

A large town situated 25 miles South of Hoshiarpur. The first and only case occurred on the 13th September and the patient recovered. The person in whom the disease occurred was not in any infected locality, and the cause unknown.

Two small villages situated about a mile from each other, and 9 miles from Hoshiarpur. The 1st seizure in these villages was on the 14th September. The largest number of cases occurred on that date (17 in number), and continued to the 29th September. Total number of seizures 33, deaths 10, deaths to treated per cent 30.33.

A small town situated 2 miles North of Pathralian and Barrianna, and 12 miles North-west of Hoshiarpur. The first seizure in this town occurred on the 14th September, and on that date no less than 22 cases were reported, and con-

tinued on an average of 3 cases daily for the first week and then gradually subsiding, and by the 4th October totally disappeared. Total number of seizures 58, deaths 27, deaths to treated per cent. 46.55.

A large village situated 3 miles East of Hoshiárpur. The first seizure occurred on the 16th September. The largest number was on that date and on the succeeding days, 17th, 18th, 20th and 22nd and entirely disappeared on the 27th September. Total seizures 50, deaths 11, deaths to treated per cent 22.60.

A small village situated one mile South-west of Hoshiárpur. The first case occurred on the 18th September and two others on the 19th, no further seizures took place. Total seizures 3, death 1, death to treated per cent 33.33.

A small village situated 2 miles North of Hoshiárpur, and a mile North-east of Khanpur. The 1st seizure occurred on the 20th September in all 3 cases out of which 2 proved fatal. Total number of seizures 3, deaths 2, deaths to treated per cent 66.66.

A large village situated 2½ miles West of Hoshiárpur on the side of the Grand Trunk Road to the right. The 1st case occurred on the 25th September, and the largest number of seizures was on that date, and continued to the 30th September when the last case was discharged. Total number of seizures 18, deaths 8, deaths to treated per cent. 44.44.

A small village situated 2 miles North of Hoshiárpur. The 1st case occurred on the 20th September and the 2nd on the 23rd both terminated favorable.

A small village situated ¼ of a mile North of Hoshiárpur, across the "Choi." To the West of this village is situated the cremation and burial grounds, at a distance of about 1,000 yards. The 1st case occurred on the 20th September, and the only one, and proved fatal in a few hours.

A small village situated 12 miles North-west of Hoshiárpur. A sporadic case occurred on the 26th September and proved fatal the same date.

A village situated 13 miles North-west of Hoshiárpur and near the village of Pathralian and Barrianna. The 1st case occurred on the 1st October, on which date the largest number of seizures took place and continued to the 6th October. The cause is attributed to importation. There being free intercourse between this and the villages above named. Total number of seizures 14, deaths 8, deaths to treated per cent 57.14.

A small village situated 12 miles North-west of Hoshiárpur. The 1st case occurred on the 3rd October, and on that date 4 seizures were reported, and continued to the 8th October, cause not traceable to "infection" or "importation" in all probability due to atmospherical influence. Total number of seizures 7, deaths 3, deaths to treated per cent 42.85.

A small village situated 12 miles North-west of Hoshiárpur. The 1st case occurred on the 3rd and on that date 4 seizures occurred. The disease continued to the 9th October. Cause not traceable to "infection" or "importation" in all probability due to climate. Total number of seizures 7, deaths 2, deaths to treated per cent 28.55.

In the month of June Thermometric reading was higher than that of 1880 in the same month, and the heat was more oppressive, with occasional dusty days, high wind invariably South-east and South-west. 4.81 inches of rain fell in this month. 2 comets visible on the 26th one travelling North-west, appearing about 7 p. m., and the other at mid-night, travelling East. In July the prevailing wind was South-east and South-west, and a rainfall of 21.38 inches was registered. The atmosphere, was very oppressive, and hot, more particularly at the close of the month. Very little thunder and lightning for the season of the year. The *Comets* continued visible to the 25th July, following the same course. In the month of August the prevailing wind was South-east and South-west, and the rain 9.35 inches, yet the number of days on which rain fell was greater than that in July causing the weather to be very hot, oppressive, and disagreeable; very little thunder and lightning occurred. The whole of September was very hot and oppressive—3.22 inches of rain registered in 2 days (18th and 19th) accompanied with thunder and lightning and slight rain on three other days completed the rainfall in this month, the prevailing wind variable. October was less oppressive and hot, no rain fell in this month, and the prevailing wind South-west.

The town at the time of the outbreak was clean and well cared for, the drains and streets were perfectly clean, and well attended to morning and evening. One well in the town and 8 others in the suburbs, the water of which was unusable were immediately closed.

There are some cases which are traceable to the use of *well water* which I shall describe as briefly as possible. The Deputy Commissioner of this district was attacked with diarrhoea having the premonitory symptoms well defined. He stated that he had been dining out the night previous, and on his return home had experienced a sense of

uneasiness in the bowels, constant rumbling, and a desire to go to the closet, and was of opinion that something *had disagreed* with him, and attributed the cause to food, but on the following day he stated that owing to some "*infusora*" in the *well-water* he had been in the habit of using, he got his supply from a different source, a well in the Katchery-compound which is adjoining to his house. On reflecting that perhaps the change of water was the cause, he again had recourse to the former well, and within 24 hours he was much better, and the diarrhoea he complained of ceased, (of course was under treatment). Two more cases I have to relate which may be worthy of *notice*. A woman in the town was seized with "Cholera" who had a child $2\frac{1}{2}$ years of age, who, (it was stated), was constantly on the bed with her, (and on my visit, I found the child asleep in her arms, with her head buried in her *bosom*.) the mother died, and 8 days after, the child was seized with cholera and died. Another case of a woman who had cholera, had nursed her infant 8 days old, several times before I saw her, the infant remained *uninfected*, and the mother recovered.

UMBALLA DISTRICT.

History of outbreak in the Umballa district. 36. The diffusion of cholera locally and chronologically is shown in the subjoined statement.

No.	Police Station.	Town and Village.	Population.	Date of 1st death.	MONTHS.												Total	Date of last death.	REMARKS.	
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.				
1	Umballa	Umballa T.	26,258	1st July							2	30	90	3			125	29th Sept.		
2	Do.	Manvah	295	8th do.							1						1	8th July.		
3	Do.	Jansai	1,506	4th Sept									1				1	4th Sept.		
4	Do.	Kongpur	340	23rd Augt.								1	18				19	13th do.		
5	Do.	Nurpur	223	13th Sept.									2				2	13th do.		
6	Do.	Dhorgarh	309	23rd do.									1				1	23rd do.		
7	Do.	Mardvan	116	22nd do.									1				1	22nd do.		
8	Do.	Dhanorah	616	24th do.									1				1	24th "		
9	Molanah	Sigah	1,367	15th do.									12	22			34	4th Octr.		
10	Do.	Harnoli	468	1st Octr.										3			3	5th "		
11	Jagadhri	Jagadhri T.	12,522	2nd Sept.									1			1	2	29th Decr.		
12	Chappar	Lavanah	526	16th do.									1				1	16th Sept.		
13	Ladwa	Ladwa T.	4,121	14th Augt.								1					1	14th Augt.		
14	Shahabad	Shahabad T.	11,660	12th Sept.									10	2			12	20th Octr.		
15	Sadhaura	Jholi	503	19th do.									5				5	22nd Sept.		
16	Naraingarh	Mugal Majra,	125	29th Augt.									1				1	29th Augt.		
17	Do.	Majra	1,545	12th Sept.									1				1	12th Sept.		
18	Do.	Labah	1,245	30th do.										1			1	30th "		
Total												3	32	145	31		1	212		

Altogether 18 places out of a total of 2,224 in the district recorded cholera; of this number, 10 places registered only single deaths, in 4 others, the number did not exceed 5 in any one of them; and in the remaining 4, the number was above 10 deaths. The total number of deaths registered is 212, of which the first occurred on the 1st July in the city of Umballa, the last on the 29th December in the town of Jagadhri. More than half the number of deaths registered occurred in the city of Umballa, 34 in the village of Sigah, 19 in the village of Kongpur, and 12 in the town of Shahabad. In the town of Jagadhri there were only 2 deaths, one on 2nd September, the other on 29th December.

From the report furnished to the Officiating Civil Surgeon by the Assistant Surgeon in charge of the City Hospital, it appears "there were rumours that some cholera had appeared in the city," prior to the date of the first death registered. "This could not be verified, as the patients had already died, and friends would not give information." It is stated, "the history of first case is most difficult to obtain in Umballa city, owing to the unwillingness of patients' friends to give information."

The first registered death was that of a poor woman residing in the jats ward of the city, who died on the 1st July after 8 hours' illness. She was not seen by the Medical officer during her illness, but after her death, it was ascertained that, on the previous evening, a few hours before being taken ill, she had eaten something cooked "rice of a very inferior kind with some curd." The second case reported was that of a Municipal messenger, who had eaten a "large water-melon on an empty stomach, and was then exposed to sun and got cholera about 11 a. m., 2nd July, and died on the 3rd." This case occurred in another part of the city in the Kaziwara Ward, on the left flank of the Main Bazar. This ward is also closely inhabited, and the house in which this case occurred "was very dark, filthy, and unclean, about 6 persons living in a small room about 10 feet x 6 and 10 feet high." On the 4th July 2 fresh cases were reported in different quarters near the Kaziwara Ward; namely, in Allahbaksh Serai and Khatri Mohalla; the patients recovered; one of them was the wife of a medical student who was employed on cholera duty; the other occurred in a house in which a boy had died, a few days before, suddenly with diarrhoea.

On the occurrence of the above cases "necessary" precautions and arrangements came in force, and selling of unripe and raw fruits was closed, the cleanliness of the city was well looked after and the disease

stopped till the 13th August 1881." On that date 2 cases of cholera occurred in those quarters of the City where the first and second cases had occurred; one of them "being without friends, was treated in the Cholera Hospital," which had been already got ready in a convenient place outside the city, the other was treated in his own house in the city; of these one recovered, the other died. On the 14th one case occurred, "on the tank outside the Lahore gate, close to the bazar of that name, where a case occurred on the previous date;" this case proved fatal. On the 15th August two cases occurred, 1 in Khatri Mohalla and the other in the Passengers' shed of the Cantonment Railway Station. Regarding the latter it is explained that the patient was a Pathan, who for some days before and up to the 14th was lodging in the city Sarai, that on the 15th he went on some business to the Cantonment Sadr Bazar, and becoming ill there he wished to return to the city by Railway; that at the Passengers' shed he became very ill and was sent on a charpoy to the City Cholera Hospital; he recovered. After this date the disease became general in the city, the period of highest intensity being from 24th August to 14th September, in these 22 days there were reported 287 seizures and 106 deaths. No quarter of the city was exempt from the disease. At the height of the epidemic the sweepers suffered severely, no less than 39 cases occurred in the sweepers' quarter. The disease is described as presenting all the usual symptoms of cholera, namely,—“Rice-watery motions generally accompanied with severe colic pains at the pit of the stomach with great thirst, nausea and vomiting, great restlessness with cramps in legs and arms, coldness of the body, great depression of spirits, stoppage of the urine, sinking of the eyes, &c.” Some cases were seen “without any purging or vomiting, but complaining of great restlessness of the body, throwing about of extremities, with intense thirst, great pain at the pit of the stomach and icy cold body, suppression of urine, and immediate death in an hour or two from the commencement.” Some of the cases, it is stated, had a marked preliminary stage for two or three hours, and in all such cases the timely use of sulphur fumigation to the body and sulphuric acid drink checked the attack.

It was observed that a greater number of Muhammadans and other castes suffered than Hindus. Out of 327 seizures—121 were Hindus, 151 Muhammadans, and 55 other castes. The difference is attributed to the observance of the Muhammadan fast, which commenced on the 28th July and ended 28th August, during which period “poor people working in the sun for the whole day upon empty stomachs, and then eating inferior kinds of grains, perhaps uncooked, and drinking largely of water on account of intense thirst” became more than usually predisposed to attack. The disease here appears to have been confined almost wholly to the city. On the 22nd August one case, which proved fatal, occurred in the Police Lines outside the city. “The man had been to the city and probably contracted the disease there.” Very strict precautions were then taken to prevent other men of the Police from going into the city, and no other case occurred in the Police Lines. “Quarantine was enforced in the Jail also, and it escaped. Free communication went on, all through, between the city and the Cantonment Bazars. Cantonment also escaped. The Police Lines are about a $\frac{1}{2}$ of a mile, the Jail 1 mile, and Cantonments 4 or 5 miles from the city in the same line.”

Regarding the weather, it is stated, that the months of May and June were excessively hot. In June rain fell on the 9th and 11th and not again till the night of the 28th. In July the weather was more or less constantly cloudy, and the temperature 8 or 10 degrees lower than in June; rain fell on the 20th and 21st and again on the 28th. In August the weather is described as “raining every 2nd or 3rd day and keeping excessively hot in the interval. In August it rained for a few days in the day, and for the remaining part of the day the velocity of the air has been very low.” About the time of the outbreak in the city on the 13th August “it commenced raining excessively, * * * and it remained so raining for many days of August.” During the course of the epidemic no direct relation between the rain fall and the prevalence of the disease was noticed. It was observed as a feature in the course of the disease that many cases occurred for 3 or 4 days and then none at all, or very few, for a similar number of days. Similarly, many cases occurred in one ward at one time, and then in another ward quite in another quarter, and after a few days again in the ward first affected.

The water-supply of the town is from wells and tanks outside the walls. Inside the city almost all the wells have run dry since several years past. The outside wells are in the fields around the town, and in them the water lies deep down and is very shallow, in none exceeding a depth of $1\frac{1}{2}$ foot. Some of these wells are provided with no parapet walls and are in consequence liable to pollution from surface drainage. In the subjoined statement is shown the distribution of the cholera in 1881 in the Umballa city.

No.	Name of Mohalla or Quarter.	Seizures.	No.	Name of Mohalla or Quarter.	Seizures.
1	Ala Bux's Sarai	2	14	Mandi and vicinity	16
2	Kiari and Pakka Bagh	15	15	Kaith Majri and vicinity	42
3	Khatri ka Mohalla	22	16	City Sarai	6
4	Kaziwara (Jhewerans and Kasaion ka Mohallas)	55	17	Kalal Majari	22
5	Chah Baru	2	18	Niabas	21
6	Chinogiron ka Mohalla	3	19	Nadipar Mohalla	5
7	Rajon ka Mohalla	1	20	Chumar Majri	2
8	Bhabron ka Mohalla	7	21	Labba ka Tank	3
9	Chaunk Manghta	12	22	Hijron ka Tank	1
10	Jats ka Mohalla	6	23	Churay Majri	39
11	Lathairon ka Mohalla	5	24	Pattiala House	1
12	Chakla and Kanchans ka Mohalla	21	25	Outside Jagadhri gate	1
13	Tundurion ka and Radha Kishin's Bazar	6	26	Police Lines	1
				Total	327

JULLUNDUR DISTRICT.

History of outbreak in the Jullundur district.

37. The distribution of the disease chronologically and locally is shown in the subjoined statement.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Jullundur	Jullundur T.	35,222	5th Augt.								378	43				421	26th Sept.	
2	Do.	Suburbs	15,702	15th do.								132	40				172	16th do.	
3	Do.	Jamshair	3,318	13th do.								1					1	13th Augt.	
4	Do.	Varamah	1,196	24th do.								1					1	24th do.	
5	Do.	Lallian Kalán	807	27th do.								1					1	27th do.	
6	Do.	Basti Pirdád	900	2nd Sept.									4				4	13th Sept.	
7	Do.	Shahbazpur	718	5th do.									1				1	5th do.	
8	Do.	Lammah Pind.	843	27th Augt.									8				8	13th do.	
9	Do.	Basti Bava Khel	1,200	12th Sept.									4				4	12th do.	
10	Adampur	Adampur T.	4,153	23rd Augt.								1	14				15	23rd do.	
11	Do.	Alawalpur T.	4,836	30th Sept.									1				1	30th do.	
12	Do.	Jalpah	374	19th do.									1				1	19th do.	
13	Do.	Badalah	192	18th do.									1				1	18th do.	
14	Kartarpur	Kartarpur T.	11,063	10th Augt.								6	38	1			45	1st Octr.	
15	Bunga	Bunga T.	4,817	9th Sept.									1	1			2	10th do.	
16	Do.	Chak Kalal	386	12th do.									7				7	23rd Sept.	
17	Do.	Bhas	1,315	29th do.										15			15	8th Octr.	
18	Rahon	Rahon T.	12,914	31st Augt.								1	10				11	27th Sept.	
19	Do.	Nawashahr T.	5,351	12th Sept.									1				1	12th do.	
20	Do.	Karimpur	621	22nd do.									1				1	12th do.	
21	Do.	Kote Ranjah	475	23rd do.									2				2	25th do.	
22	Do.	Dalavarpur	175	6th Octr.										4			4	13th Octr.	
23	Phillour	Phillour T.	6,251	16th Augt.								8	15				23	21st Sept.	
24	Do.	Sargondi	988	18th Sept.									1	2			3	22nd do.	
25	Do.	Dhaasian Sang	1,235	21st Augt.								1					1	21st Augt.	
26	Nurmahal	Nurmahal T.	9,025	24th do.								8	43				51	30th Sept.	
27	Do.	Jandiala	6,007	17th do.								49	7				56	7th do.	
28	Nakodar	Nakodar T.	9,780	16th do.								9	2				11	1st do.	
29	Do.	Chak Muglani	1,105	27th Sept.									7				1	27th do.	
				Total								596	246	23			865		

Altogether 865 deaths were registered in 29 different localities out of a total number of 233 in the district. The disease prevailed for 3 months of the year, viz. August, September and October. The maximum deaths occurred in the first month (August) of the outbreak. From the report of the outbreak furnished by Dr. Penny, the Civil Surgeon, it appears that a severe outbreak of cholera commencing in the city of Jullundur spreading thence to the Bastis or Suburbs and subsequently to every one of the four tehsils of the district occurred between the 15th July and 30th September 1881. The number of seizures and the localities in which they took place (as shown in the last daily report dated 13th September) is given in the margin.

The last visitation of cholera was in 1879, and for the purpose of showing the difference in time and order of places attacked in 1879 and in 1881 the Civil Surgeon furnishes this table:—

1879.		1881.	
Towns.	Dates.	Towns.	Dates.
Phillour	14th April.	Phillour	2nd August.
Adampur	17th "	Adampur	23rd "
Bunga	18th "	Bunga	21st "
Kartarpur	20th "	Kartarpur	10th "
Jullundur	22nd "	Jullundur	15th July.
Nakodar	22nd "	Nakodar	15th August.
Alawalpur	26th "	Nurmahal	24th "
Nawashahr	28th "	Nawashahr	12th September.
Jullundur suburbs	29th "	Jullundur suburbs	15th August.
		Jundialla	16th "
		Rahon	31st "

In that year 88 victims were numbered and the disease was said to have been spread by pilgrims. In this year without pilgrims there was a regular explosion in the city.

The Meteorological statements give clear testimony of what wind and weather were like. 23·48 inches of rain fell in the course of July and August, the greatest amount in any one day being 6·86 on the 10th July—26 days in July were more or less cloudy and there was not a whole day in August with clear sky. The air was laden with moisture and teeming with life, steamy and oppressive to a degree. All around the city the Civil Surgeon says "we were water-logged by large accumulations of storm-drainage."

The wretched state of rain and damp that prevailed in the mud-dwellings in which very many of the cholera cases occurred would hardly be believed. Still up to the end of July there was singular immunity of disease throughout the Jullundur Doab as shown in the Jail, Police, and Dispensary statistics.

The Civil Surgeon has been unable to trace more than three unreported cases of cholera which occurred before the despatch of his Memo. No. 142, dated 5th August 1881, reporting a seizure in the Dispensary where the son of the Bhisti was attacked with cholera on the 3rd August. On inquiry he discovered that on the 15th July there was an unquestionable case of cholera, another on the 26th July, and a third on the 1st August, of which short notes follow :—

(a) Pirthi, Hindu, age 32, was one of the two brothers who kept a sweetmeat shop in the bazár inside the city, was seized during the night with the symptoms of cholera and was seen and attended by his aunt a shrewd old lady who gave every detail. He took ill during the night of the 14th July 1881, and was removed to a dwelling house on the morning of the 15th where he died. The brother also died of cholera in the height of the epidemic. Pirthi's death was registered No. 521, cause "Dard Pehlu" Pleurisy.

(b) Peri who had been ailing from fever but was playing about when, as his brother and father informed us, he was taken ill with cholera and died on the 27th July, death being registered as fever.

(c) Then on the 1st August in a house about 50 yards from the Dispensary Mahamed Ali, aged 14, was seen by the Municipal Hakim, and it being fatal in a few hours with choleraic symptoms, he had no doubt of its genuineness. No connexion could be traced between these three cases of the 15th and 26th July and the 1st August.

It was reported that on the 30th and on the 31st July, and on the 1st of August thousands of persons came from Lahore and Amritsar by train, alighted at the city station, went freely to the bazárs of the city, visited friends and relatives at their houses; some slept the night here, all were en route to Chintpurni, a shrine beyond Hoshiárpur, near Purwain Bungalow, but no case of cholera was discovered amongst them.

A European-driver of the Mail Train from Lahore where cholera was prevalent arrived at Phillour on the 2nd August and died that day. Cholera symptoms began soon after the train left Lahore.

The 3rd August was the date of attack of the Bhisti's son who died in the dispensary and which was the first case of cholera, which was recognized in this city. On the 5th there were 4 seizures three of which were in Ali Mohalla, a quarter of the city which afterwards suffered more than any other. Another section approached it very closely in number of seizures and severity of type, and this was the Killa occupying the site of the old Fort: its East face having a perpendicular drop of 60 feet: Ali Mohalla on the West side of the city limited by the Grand Trunk Road and the lowest in level, bisected by an open sewer full of stagnant sewage, and the Killa, the highest portion of the city, on its East side, were fearfully attacked by the disease. From the 6th to the 13th the whole city was studded with cases. On or after the 13th August the epidemic raged with intensity especially in Ali Mohalla and in the Killa: the daily seizures numbered from thirty to forty and upwards. There were 23 fatal cases on the 15th and 24 on the 16th. Panic prevailed about this time, and numbers of people fled in every direction, several thousands were said to have left by rail and a great many made for Nakodar, Jandiala, and Nurmahal: the number, however, as was afterwards ascertained, was greatly exaggerated at the time.

Dr. Penny writes :—

"It was a harrowing sight to visit the low quarters of the town such as Ali Mohalla, or treading ones way in and out of narrow passages and fearfully crowded dwellings as in the Killa: often black and cobwebby, perhaps roof falling in, and a running stream of rain drainage under the charpoys the patients were sleeping on. The scenes were calculated to terrify when partly from desertion and chiefly from death it was as though one were in the city of the dead, the stillness only broken by the wailing of the mourners."

On Monday, the 15th August the Jail being then in rigid quarantine, a prisoner was seized with the illness and was dead at night.

The severely affected quarter of Ali Mohalla lies on the one side of the Grand Trunk Road opposite to where the Jail stands on the other side of it. And the road to the Bastis or suburbs where the disease broke out with great violence, passes along side the Jail garden. Nevertheless no other death occurred in the Jail.

A female prisoner in the Lock-up had to be moved into the quarantine but she recovered.

The wife of the Head Master, a Eurasian lady, was attacked, she also recovered.

It is noted that at the time of the appearance of cholera the Muhammadans' fast was being observed and that the Muhammadans were attacked in very much greater proportion than Hindus. The fast ceased on the 28th August.

From the 13th to the 20th the epidemic was in high tide. After that the disease began to subside and the deaths fell from double to single figures.

A gradual decline in the number of new cases took place and the deaths became fewer and fewer till the 13th September when a single case and one death were recorded, after which the epidemic entirely ceased in the city of Jullundur.

The suburbs or Bastis of Jullundur are more like three or four small towns close together and about $1\frac{1}{2}$ mile from the North-west corner of the city. They are not suburbs in the ordinary sense. Their names are Basti Shekh, Basti Guzán and Basti Dánishmandán. There is great intercourse between the city and these suburbs, but no cholera case in them was observed till after the great outbreak and consequent panic in the city on or about the 13th or 14th August, when a large number of persons left the city for the Bastis. In the Bastis crowded dwellings, chiefly mud-huts nested together, badly ventilated, and fearfully crowded, were of the same description as were found in the Jullundur city. Neither in the Bastis nor in the city, however, was cholera wholly confined to the dwellings of the poor and destitute. In the city "an old Member of the Municipal Committee suffering from chronic venereal disorder was one amongst many who fell victims to cholera." In the Bastis, "a well-beloved Wakil of considerable means became a victim." In the Bastis from 5 cases on the 15th August, the cases rose to 28 on the 27th August and 30 on the 1st September.

After this there was a marked decline, and the list for the suburbs closes on the 16th September with a single admission and death. The mortality was highest on the 29th August when 13 cases were registered.

The ratios of seizures and deaths to population in the city and suburbs within Municipal limits are shown below in contrast:—

	Population.	Seizures.	Deaths.
City ...	35,222	751	339
Suburbs ...	15,702	355	151
Ratio per mille ...	...	21.7	9.6

In the city the relative number of seizures and deaths according to caste were up to 16th September.

	Seizures.	Deaths.
Muhammadans ...	460	215
Hindus ...	191	110
Other classes ...	18	14

At Kartarpur which is a Railway Station on the Sindh, Punjab and Delhi line, Lahore side of the city, a case on the 10th August which was fatal is recorded. It occurred in a faqirs' garden outside the town in the person of a young man who had been one of a wedding party, which passed through Jullundur city 2 days before and travelled by road. No other case of cholera occurred here till the 20th when the mate of a gang of coolies working in the Grand Trunk Road died in a hut nearly opposite to the Rest-house which is a short distance outside the town. The next case reported occurred on the night of the 27th August in the family of the chowdri in the butchers' quarter, which occupies a corner of the town, when a Muhammadan woman was seized with cholera and died the following morning. Another woman and child who were servants to the household were attacked on the same night in their own house. Then came two other cases in the course of the two following days in that one corner of the city. The Tehsildar fearing that the well used by the people in this locality had been contaminated had it closed. He fumigated with sulphur the inside and outside of the houses, but the disease spread into the town until there were 91 seizures and 52 deaths, being a ratio of 35 per mille (population 11,053).

At Nakodar, population 9,780—cholera reached this town on the 14th August. It is 15 miles to the West of the city with a large ekka traffic on a good pacca road. The earliest case of cholera was that of a man called Radha, 20 years of age, employed as a *Law Agent* and in the habit of attending the Jullundur Katchery. He did so on the 14th August, and while in Jullundur he put up in the Guru's Haveli, Ali Mohalla, while returning to Nakodar he became ill, and Hospital Assistant Moti Lal was called to attend him. Radha died on the 16th. Then on the 17th his own child, a girl Dhanty 10 years of age was seized. There was no other case of cholera till the 21st, when an old woman 50 years of age living close to Radha was attacked.

The 4th was on the 23rd and it occurred to a man who was a servant employed by the family of a subordinate in the settlement department whose family fled to Nakodar. He died. On the 27th in this same Mohalla a boy 8 years of age was attacked immediately on arrival from Jullundur. In all, there were 21 cases of cholera in Nakodar, which were limited to one section of the city; of these 10 were fatal.

Nurmahal town is a large town in Phillour tehsil with 4,086 inhabitants, and is reached either via Nakodar, or by a direct road from Jullundur through the large village of Jandiala. There were 112 cases and 46 deaths, the earliest case was that of Ghirdhari, a Brahmin, aged 25, who went to give evidence in Rai Oojagarmal's Court in Jullundur.

He stayed in Guru's Haveli and returned on the 23rd August, when he was seized with cholera and died on the 24th, the next were importations; two young men who were brought ailing with symptoms of cholera at 10 p. m. on the 25th August, from the Basti Darwesh suburb of Jullundur, where they had stayed two days with their mother and another brother. On the 4th September the wife of Tehla, a Brahmin, died only a few hours after her arrival from Phagwara. No quarter of the town seems to have escaped. The disease ended at the end of September.

Jandiala is an approaching it like an over-grown village. It is 7 miles from Nurmahal, and 16 from Jullundur, crossing the river Beyne by ferry. There are about 5,000 inhabitants. Cholera cases were 125, and deaths 56, giving a ratio of 11·2 per mille, showing the disease was of an unusual severity here. The very compact, nested and closely hemmed in character of the interior of this village was remarkable, the lanes are so narrow that two persons cannot walk abreast through them. It was like a maze. There was remarkable cleanliness in the houses. The people are in constant communication with Jullundur, as 15 or 20 people go to and fro daily. There was no appearance here of storm-drainage, as there was about Nurmahal and Nakodar with their surroundings of stagnant water. The last case of cholera was on the 12th September 1881.

Adampur is 15 miles on the Hoshiarpur road with 4,153 inhabitants, and it had 13 seizures and 10 deaths. A traveller named Kura, Hindu, 30 years of age, from Kartarpur is the first case on the list. It occurred on the 24th August. Days elapsed before there was another case, when on the 10th September, Omar Din, aged 10 was seized and died ten days afterwards. Other cases occurred and the disease was soon scattered over the town and the last case happened on the 27th September.

In the village of Chak, Bungah circle, 18 cases and 6 deaths were recorded. The village is about two miles distant from Bungah town. There are five agricultural villages quite close and all the cases occurred in one only. The first case was that of Mussammat Mango, 20 years of age, brought by her brother from Jullundur on 7th September, and during the journey she had diarrhoea and vomiting. It was genuine cholera. On the same day that she arrived the brother's son Harnam Singh was seized and died on the 13th. 22nd September was the date of the last case.

Nawashahr which lies between Bungah and Rahon, is a large town with a population of 5,351, chiefly Hindus, amongst whom was only one case. A Brahmin residing in the heart of the town close to one of the largest *Shawalas* was attacked on the 11th September. It appeared that Diwan Achhru Mal of Kapurthala arrived on a visit to the town having lost his child from cholera. Finding the Brahmin ill, he wrote for the Hospital Assistant at Rahon to come and attend, which he did, and found it was cholera, and the man died the following day.

Rahon is quite up in the East corner of the district on very high ground, the houses rising one above the other; the School, Thana, and Rest-house forming the summit and commanding an extensive view of the hills and the river Sutlej emerging from them. There are 12,914 inhabitants, and 20 cases of cholera are on the list as having occurred between the 1st September and the end of the month. They did not all occur in the city, in fact the first case was in the village of Sotah, about 3 miles off in a clump of trees far away towards the hills. A woman called Mussammat Basri was visited on the 1st September by the Hospital Assistant, found to have cholera and died the same day. She and her brother were constantly in the habit of going to Rahon. The woman had been fasting, and it was after eating at the Festival of "Eid" that she took ill. Five more cases occurred in this village. On the 2nd September the first case occurred in the town of Rahon, in the person of one of the Municipal sweepers who died very soon after seizure. Then came a succession of 12 cases at long intervals, but mostly towards the East side of the town. Five cases occurred at Sotah, and three in the Karanpore villages between Rahon and the hills. There was a maker or seller of *Kupis* who came from Hoshiarpur on the 6th September and was carried off by the disease while in the house of another *Kupiwala* in the town. Rahon was the last place in the district in which cholera cases were reported.

In this tehsil there were 36 cases of cholera of which 26 were in the town or Railway Station of which 17 were fatal; 16 cases occurred in the village of Sargondi a mile from Garai the first station from Phillour upside, and of these 3 died. Two European drivers brought cholera with them from Lahore and died in Phillour, and a native employé also died of cholera. The fort was free. Of these cases the first one was Salig Ram who arrived by Local Train on the 19th. The Quarantine Hospital received three destitute persons suffering from cholera. It was unknown when or how the Sargondi cases originated.

The Civil Surgeon, Dr. Penny, concludes his report with the following remarks:—

"I have made these few running remarks on the outlying places where cholera was in the order of my visiting them, and in making my investigation I have tried to discover the connection of one case with another, either by the water-supply or by contiguity in every possible way I could think of; but too often only to be baffled." Sulphur fumigation gained immense popular favor and the member of the

Municipal Committee who lives in Ali Mohulla personally superintended it in a most praise-worthy manner, and I believe with benefit."

To each section was supplied a portable tray containing medicines, tins of disinfecting powder, bottles of mustard and any sherbats or *laips* (ointment) which any of the Hakims might suggest. Meanwhile sanitary measures were actively carried on. The Magistrates and Members of Committee itinerated like myself. Dewan Ram Nath, the Secretary, having a special charge of the Bastis. The very offensive nuisance of 'Chabachas' or house-sinks were on every possible occasion put a stop to. Stale fruits, such as mangoes and melons were condemned.

Whilst well-cleaning went on I took the opportunity of testing whether there was any connection between the water-supply and particularly affected localities but it failed me. The precautions in regard to the dwellings and clothing of persons affected with cholera were attended to, but much has yet to be done that must at the height of the epidemic have been left undone. On the site of the old heap of the Killa one of the highest parts of the city is an enormous female latrine bounded by three walls, in and out of which in the early morning women may be seen passing like bees in a beehive, than which nothing can be conceived more inimical to the public health in a time of cholera. This was closed for the purpose of purification. The schools under the Revd. Golak Nath were closed at my recommendation and I made a suggestion that the Katchery should be stopped from witnessing the great crowd one sees in the compound. It surely is remarkable that both Cantonment and the Jail have almost entirely escaped. As far as I have been informed the native community of the Cantonment Bazar have not suffered. There were four seizures and three deaths amongst the British troops but quite at the end, if not after, quarantine ceased. Both Jail and Cantonment were placed in quarantine and only one case occurred in the Jail. In the breaking out of cholera in a city quarantine seems to be the first dread in the eyes of the people and their sole motive of concealment, because as soon as it became known we were going to do nothing of the kind and intended to bring medicines to their doors they willingly gave us information. I think our returns were as accurate as could be wished for: now that the epidemic is over their gratitude is unbounded in that they were not dragged from their houses to be put into a Quarantine Hospital. It has been shown that with improved sanitation the larger cities of the Punjab have suffered very much less from cholera than formerly. The site of Jullundur is most unfortunate for its drainage which beyond dispute has for years been a growing evil. Only two years ago great efforts were instituted to improve the sanitation and wells have been made for the sole purpose of sluicing the drains but unfortunately there is no main sewer to carry off the diluted sewage which accumulates in huge excavations, immediately outside the city on its Western side. It is like adding fuel to the fire. In the rains the low level of the country caused the regurgitation of the sewage into the city along the sewers and the rise in the water-level in the wells at the same time. With the memory of the recent epidemic fresh on the mind it is impossible to forget the crowded or ill ventilated dwellings of the poorer classes and I would ask is it not possible to make property owners responsible in some manner for cleanliness and ventilation: especially with reference to a measure of reform now in hand, viz., that of removal of outside cisterns. Another result of the recent epidemic to be thoroughly proved and over which no pains should be spared is the removal of every source of reinfection in every place or house wherever the case of cholera has occurred."

JHELUM DISTRICT.

History of outbreak in the Jhelum district.

38. The following statement shows the diffusion of the disease chronologically and locally in the Jhelum district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Date of last death.	REMARKS.	
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Total.
1	Jhelum	Jhelum T.	11,319	7th Augt.	...	...	...	...	...	...	...	1	1	5	...	...	7	26th Octr.	
2	Do.	Chakar	547	2nd Octr.	...	...	...	...	...	...	...	...	...	4	...	...	4	3rd "	
3	Soháváh	Soháváh	937	16th July	...	...	...	...	...	...	...	1	...	...	...	...	1	16th July.	
4	Do.	Miani Sedan	126	12th "	...	...	...	...	...	...	...	5	...	...	...	...	5	19th "	
5	Chakwál	Chakwal T.	5,674	1st Octr.	...	...	...	...	...	...	...	...	...	1	...	...	1	1st Octr.	
6	Do.	Kotahwal	121	17th Sept.	...	...	...	...	...	...	...	...	1	...	...	...	1	17th Sept.	
7	Tuman	Narah	*	15th "	...	...	...	...	...	...	...	...	1	...	...	...	1	15th "	
				Total	...	...	...	...	...	6	1	3	10	...	...	...	20		

* Not known.

In this district cholera did not prevail in an epidemic form, but 20 deaths altogether were registered from the disease in 7 different localities, viz. 7 in the town of Jhelum, 5 in the village of Miani Sedan, 4 in that of Chakar, and single deaths only in four other villages. The Civil Surgeon makes the following remarks:

" There was no epidemic during the year, 12 cases of cholera occurred amongst the Railway employés, but in almost every case the persons attacked either arrived by train at Jhelum actually suffering from the disease, or had come from Lahore, where cholera was epidemic, a short time before they were attacked.

Three cases occurred in the city one a cook who kept an eating house in the bazár, and who in that way might have come in contact with travellers passing through, who were suffering from the disease or had come from infected districts. The second was that of a shop-keeper with whom the Railway employés dealt, and the third case was that of a Police-man who lived in the tehsil. Thirteen other cases occurred in the district, and in nearly all there was good evidence to prove that they were imported cases nearly all having come from the line of Rail a short time before they were attacked."

GUJRANWALA DISTRICT.

History of outbreak in the Gujranwála district.

39. The following statement shows the diffusion of the disease chronologically and locally in the Gujranwála district.

No.	Police Station.	Town and Village.	Population.	Date of first death.]	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Gujranwála T.	Gujranwála T.	20,362	27th Augt.								2	146	5			153	6th Octr.	
2	Do.	Atavah	1,222	3rd Sept.									7				7	24th Sept.	
3	Do.	Gondlanwála	2,636	16th do.									1				1	16th do.	
4	Kamoke	Jandáli	686	29th Mar.			1										1	29th March	
5	Do.	Eminabad T.	6,719	3rd Sept.									4				4	25th Sept.	
6	Do.	Dhallanwali	652	4th do.									3				3	6th do.	
7	Do.	Ratali Khurd	290	5th do.									1				1	5th do.	
8	Kila Didar Singh	Botalah	1,942	7th do.									1				1	7th do.	
9	Do.	Dochhah	482	29th do.									2	8			10	11th Octr.	
10	Do.	Bhoman	511	29th do.										3			3	3rd do.	
11	Do.	Uhdowali	1,302	24th Nov.											1		1	24th Novr.	
12	Wazirabad T.	Wazirabad T.	15,346	18th Agt.									19	35			54	23rd Sept.	
13	Do.	Gakhar	2,908	4th Sept.										20			20	20th do.	
14	Akalgarh T.	Akalgarh T.	5,037	24th do.										1			1	24th do.	
15	Do.	Ramnagar T.	7,180	10th June				1									1	10th June.	
				Total ...			1	1			21	221	16	1		261			

The total number of towns and villages affected was 15 out of a total of 1,177 in the district. The highest number of deaths occurred in the month of September. The Civil Surgeon gives the following account of the outbreak:—

" Although cholera had shown itself in Lahore early in June, no cases occurred in this district (notwithstanding direct Railway communication) until the end of July. The first case recorded in the Sadr Town was on the 27th of August. The person attacked was a Native Pleader, whilst residing temporarily in the city of Lahore, who, soon after he was taken ill, was brought in by Rail by some of his relatives to his family house in Gujranwála. His wife who attended him on his arrival was seized the same night, and both died on the following day. After this, the epidemic spread, into different parts of the district. The largest number of deaths (when the epidemic may be said to have attained its worst) on any one date, occurred, on the 10th August. The last case was recorded on the 16th October, so that the entire period of its prevalence, in this district, extended a little over 2½ months.

The total number of seizures was 244, and deaths 146, giving a ratio of 59 per cent of deaths and seizures. A rate of mortality rather under perhaps than over that of the last two epidemics. The instances were few in which the disease presented itself in a very virulent type.

Mortality.

The case of Colonel Millar, Deputy Commissioner of Gujránwála, was of all, probably, the most sudden and severe: a few particulars as to which may not be uninteresting. He took ill about midday on Sunday, the 11th September. At 7 o'clock that morning he read the Service in Church, returned home to all appearances well and cheerful: wrote some home letters, and at the usual hour—about 10 o'clock, had his breakfast, which consisted simply of rice and milk and some jam. He then, his servants state, arranged some wines on a side-board, in anticipation of the arrival of his successor Captain Roberts, who was expected by train, and would relieve him of the charge of the district that evening. After seeing to the arrangement of the wines, it appears, that he sat down in an easy chair, near the front door to read some newspapers. About half an hour later on, *i. e.*, about 12 o'clock, the attention of one of the servants seated in the veranda, was attracted by a strange noise, as if something heavy had fallen, and on going into the room discovered the Colonel lying stretched unconscious on the carpet. He was removed to his bed, and when roused to speak, could only answer in whispers. The usual symptoms now set in with fearful severity. The vomiting and purging were constant, the limbs became rigid with spasms, the eyes sank in their sockets, and by about 2 o'clock not only the face and extremities, but the entire surface of the body became livid. He gradually sank and died at 7 o'clock in the evening, just about half an hour before the arrival of his successor. These details do not present any new, or uncommon phase in regard to the symptoms which ordinarily characterize or identify this terrible scourge, but they afford, I think, an example of the frightful suddenness and rapidity with which, without the slightest warning it sometimes carries off its victims.

Beyond being, on the whole, of a somewhat milder form, compared with previous epidemics, the disease did not appear to me to exhibit anything particularly noteworthy in its character or course. The facts recorded in connection with the first case, leaves not the shadow of a doubt, that its spread from Lahore to Gujránwála was due to direct importation. Its advent was not preceded by any indications of an altered state of health, among the inhabitants,—such as a disturbance of the digestive organs, &c., any more than is usually present when no cholera threatens."

FEROZEPORE DISTRICT.

History of outbreak in the Ferozepore district.

40. The following statement shows the diffusion of the disease chronologically and locally in the Ferozepore district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Date of last death.	REMARKS.	
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Total.
1	Dharmkot ...	Darta ...	673	20th July							5						5	20th July.	
2	Baga Porana...	Baga Porana ...	1,953	1st Sept.												6		7th Sept.	
3	Ditto ...	Alamwala ...	180	9th "												1		9th "	
4	Nihal Singhwala	Lopoki ...	3,011	18th "												1		18th "	
6	Ditto ...	Badni Kalan ...	3,231	20th "												1		20th "	
6	Nathanah ...	Nathanah ...	4,430	5th "												1		5th "	
7	Ditto ...	Meraj Gholia ...	1,793	5th "												8		16th "	
				TOTAL ...							5					18			

The number of towns and villages affected was 7 out of a total number of 1,276 in the district, and the total number of deaths registered was only 23, all of which however were returned under the head of (fever and other causes) in the Police mortuary returns; but after further enquiry from this office they were ascertained to be due to cholera.

An Hospital Assistant who was sent to Gholia to investigate the circumstances attending the outbreak of cholera there reported that 5 deaths from cholera had occurred in that village, they were, as he was informed by the lambardars and heirs of the deceased as follows:—1 Kupuri, 2 Mussammat Tabi, 3 Mussammat Partabi, 4 Mussammat Indi, 5 Jaswant. All of them were attacked by purging and vomiting, the stools being like rice water. The symptoms described are contraction of the skin, confusion, retention of urine, faded face, small eyes, wrinkled cheeks, and overpowering thirst and heat; the patients at last became cold and died.

The first case occurred on the 6th of July in the person of the woman *Jinani* who fell ill and died after 18 hours. No other case of cholera was found in this village, but the disease was said to have come from a small neighbouring village of the same name, *viz.*, "Gholia Khurd" or little Gholia

where it was prevalent. The cause of the prevalence at Gholia Khurd was assigned to importation by a man named Fatha, durzee (tailor) of the village, who went to Hardwar. On returning he was attacked by cholera at the town of Jagraon in the Ludhiána district and some 13 miles distant from the village. In the same bad state he reached the village and died after a few hours.

The lambardars and heirs of the deceased at Gholia Ka'án stated, that from the 6th to the 22nd July 34 persons were attacked by cholera, of whom 20 died and 14 recovered. They also stated that the condition of all the sick was alike, but that those whose urine was continued were saved and the rest died—many of them were attacked at night.

AMRITSAR DISTRICT.

History of outbreak in the Amritsar district.

41. The distribution of the disease chronologically and locally is shown in the subjoined statement.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Amritsar	Amritsar T.	136,166	29th Mar.			1	1		1	3	45	328	225	8		612	7th Novr.	
2	Ditto	Suburbs	6,215	8th Octr.										1			1	8th Octr.	
3	Ditto	Katinian	1,203	28th Mar.			1										1	28th Mar.	
4	Ditto	Kote Sed Mahmud.	1,136	4th Sept.									29				29	21st Sept.	
5	Ditto	Verkah	1,896	6th "									1				1	6th do.	
6	Ditto	Tung Pain	917	17th "									3				3	18th do.	
7	Ditto	Kathalah	1,245	19th "									1				1	19th do.	
8	Ditto	Tung Bala	717	4th Octr.										1			1	4th Octr.	
9	Ditto	Gilwali	1,481	1st "										1			1	1st do.	
10	Kathunangal	Majitha T.	6,094	11th May				1				1	14	2			18	17th do.	
11	Ditto	Kathunangal	1,468	25th Aug.								1						125th Augt.	
12	Ditto	Bhoman	1,482	4th Sept.									7				7	11th Sept.	
13	Ditto	Jahal Mandair	149	5th "									1				1	5th do.	
14	Ajnalah	Ram Dass	5,257	22nd June														122nd June.	
15	Ditto	Kora Nangal	611	5th July								1						1 5th July	
16	Ditto	Raja Sansi	1,688	26th Sept.										1				1 26th Sept.	
17	Lopoki	Baggah	1,101	5th Augt.									2					2 5th Augt.	
18	Ditto	Thattah	440	24th Sept.									16	1				17 2nd Octr.	
19	Ditto	Morah	529	23rd "									3					3 27th Sept.	
20	Tarn Taran	Tarn Taran T.	3,133	25th "									2					2 25th do.	
21	Gorindah	Gorindah	893	6th "									2					2 6th Sept.	
22	Vairowal	Vairowal T.	5,958	22nd June							1							1 22nd June.	
TOTAL							1	2	1	3	4	49	407	232	8		707		

The total number of deaths registered is 707, the first of which occurred on the 29th March, in the city of Amritsar, the last on the 7th November, also in the city. Altogether 22 places out of a total of 1,099 in the district recorded cholera; of this number 12 returned only single deaths, in 5 others the deaths did not exceed 4 in any one of them, and in one of the remaining 5 the number was only 7; in the other 4 the deaths were distributed as follows:—Amritsar city 612; Kote Sed Mahmud 29, the first on 4th and last on 21st September; Majitha 18, the first on 11th May, the last on 17th October; and Thattah 17, the first on 24th September, the last on 2nd October. More than six-sevenths of the entire registered mortality occurred in the one town of Amritsar, and it was confined to the intra-mural area; the suburbs outside, comprising the civil station, population 6,215 returning but a single death from this cause, on the 8th October. In previous years this city is known to have been visited by epidemic cholera in 1805—13-27-45-56-62-65-67-69-75-79 and 81. Regarding the first six of these we have no statistical records. Regarding the last six we have records of the

Year.	Cholera deaths.
1865 (not available.)	
1867	... 1,488
1869	... 3,041
1875	... 756
1879	... 524
1881	... 612

mortality registered on each occasion. The figures stand as shown in the margin. The details of the outbreak of 1881 have unfortunately not been very clearly recorded, owing to the immense amount of work daily engrossing the whole time of the medical officers and subordinates. From the district mortuary returns it appears that isolated deaths from cholera were registered in the city long prior to the outbreak of the epidemic. The first of these occurred in the month of March, another in the

month of April, a third in June, and then 3 in July. In August the epidemic prevalence of the disease was established and 45 cholera deaths were registered in that month. In September the number rose to 328, in October it stood at 225, and in November sunk to 8. After this month no cholera was recorded. The cholera of 1881 in Amritsar city is remarkable for its resemblance to that of the year

1869. In both the years compared the cholera was associated with and followed by an epidemic fever which destroyed many more lives than were attributed to the cholera. The mortality registered under the two diseases during each month of the years 1869 and 1881 is shown in the subjoined statement.

DEATHS REGISTERED FROM CHOLERA AND FEVER IN THE AMRITSAR CITY IN 1869 AND 1881.																										
Year.	Janv.		Feby.		March.		April.		May.		June.		July.		August.		Sept.		October.		Novr.		December.		TOTAL.	
	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.
1869	3	146	4	110	1	95	4	133	16	221	38	271	567	381	2,330	363	75	357	2	785	1	1,568	....	634	3,041	4,764
1881 .. ..	..	209	..	154	1	170	1	189	..	193	1	231	3	171	45	296	328	2,652	225	4,279	8	2,540	....	950	612	11,724

Reporting on the epidemic at Amritsar in 1881, the Civil Surgeon, Dr. Ross, writes—"The heavy rainfall which commenced in June, caused immense collections of water over a tract of canal irrigated ground to the North and North-east of the city of Amritsar. The two natural drainage channels:—The Guantala Nalla and the city ditch being quite inadequate to carry off the water, the consequence was that the spring level rose to an unprecedented height; water even bubbling up like miniature geysers. All the wells became thoroughly polluted and the water in them tasted distinctly brackish. "Fever" in the city did not appear in an epidemic form until September, it was preceded by cholera, which shewed about the beginning of August. * * * This cholera was of an extremely fatal type, and later on, when masked by fever, there was some difficulty in recognizing it in time. The fever which prevailed with its utmost force in September and the early part of October, appeared to be of the relapsing fever species, but with some affinity to cholera. There were the signs, fearfully severe headache, insomnia, disordered bowels (often constipated), suppression of urine, and death by coma frequently within a few hours after seizure of relapsing fever, but then the rice water evacuations and vomit of cholera appeared in very many instances during the course of an attack of the fever. The two diseases—*Cholera* and *fever*, supposing them to be distinct certainly masked one another so effectually that diagnosis was extremely difficult at times. The people by the end of October began to show the exhausting effects of the epidemical fever; enlarged spleen, anemia, debility, jaundice, &c. told fatally on their enfeebled constitutions. This specific fever was strictly confined to the city, and to only those who had to go there. The civil officers all suffered severely, getting frequent relapses. I observed in Kohát in 1869, an outbreak of fever very similar to the Amritsar epidemic, followed by cholera; it was then also observed that it was an impossibility to tell when the cholera commenced; the symptoms of many cases of the fever being so similar." Referring to the Jail, Dr. Ross, writes—"The fever which broke out in the Jail, which was in a swamp, and where the prisoners were lying on the damp earth, was distinctly of the ordinary autumnal type *Malarious* caused by rise of water-level to the surface in a soil impregnated, not with a urine or excrement, or dead men's bones as at Pesháwar, but with vegetable matter. This fever was very mild, was curable by Cinchona Febrifuge or Quinine, and left no sequelæ. The Civil lines and the district also did not suffer from epidemic fever." Dr. Ross adds "the above report is written without any notes to refer to, work was too severe and harassing to permit of much writing to be done. The records of the 6 dispensaries, in which 1½ lac of people were treated had to be kept in the roughest manner." In his summary Dr. Ross writes—"There were two distinct kinds of *fever* to be found at Amritsar in September and October. (1.) A specific city fever. (2.) Ordinary malarious fever (outside the city), and also epidemic cholera, No. 2 may be dismissed without further mention. No. 1 was a specific fever masked and frequently interrupted in its course by cholera, to which disease it presented often somewhat similar symptoms making diagnosis next to an impossibility.

- (a) This was well observable in the Police camp, where several cases admitted as ill from *fever* were attacked with choleraic symptoms and died. The Hospital Assistants expressed their inability to recognize these cases as cases of cholera, in the first instance.
- (b) In the city too I had to give positive orders that all cases in which vomiting and purging occurred should be treated as cases of cholera and not of fever.
- (c) In not one, but in fifty to one hundred cases was the "*materies morbi*" (of the two diseases?) "observed to be operating in the same individual and at the same time." Dr. Ross adds "this fever was highly infectious, whole households being down at the same time, and only those whose duty took them inside the city, living outside, contracted this cholera fever, as it has been called. Quinine did not cure the disease, removal from its vicinity did. The sequelæ of this epidemic fever were severe, and resembled those of relapsing fever."

Being myself engaged elsewhere on duty with the Special Cholera Committee referred to at the commencement of this Section Dr. Bennett, Deputy Sanitary Commissioner, Eastern Circle, in October was instructed to proceed to Amritsar to investigate and report on the nature and peculiarities of the fever prevailing in that city. His very clear and instructive report is reproduced *in extenso*—in Appendix A. I may add that having myself visited Amritsar early in November with the Cholera Committee I am enabled to add my testimony to that of Dr. Bennett in respect to the starving condition of the Kashmiri Shawl-weavers, who were the principal sufferers during this epidemic, as well as to the intermittent and remittent types of fever with their usual sequelæ then prevailing in the city.

GUJRAT DISTRICT.

History of outbreak in the Gujrat district.

42. The following statement shows the diffusion of the disease chronologically and locally in the Gujrat district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Date of last death.	REMARKS.	
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Total.
1	Gujrat ...	Gujrat T. ...	17,401	21st Augt.								2	3				5	19th Sept.	
2	Ditto ...	Jalálpur T. ...	14,014	24th „								19	9				28	15th „	
3	Ditto ...	Kunjah T. ...	5,355	19th „								1					1	19th Augt.	
4	Lala Musa ...	Phalair ...	495	4th Sept.									1				1	4th Sept.	
TOTAL ...												22	13				35		

The total number of towns and villages affected was 4 out of a total of 1,414 in the district, but the disease prevailed in an epidemic form only in the town of Jalálpur.

The highest number of deaths (22) occurred in the month of August. The Civil Surgeon gives the following account of the outbreak:—

“The epidemic of cholera which prevailed in the Punjab in 1881, reached this district on the 18th August last, and ended on 19th September. It appeared in three localities, viz. the towns of Kunjah, Jalálpur and Gujrat.

The first case occurred in Kunjah, situate seven miles West of Sadr station, on 18th August, the subject of which had joined a marriage party from *Lahore* three days previously—at the village of Thatta. He died on 20th August—and no more cases occurred there. The Native Doctor who treated this person is an experienced man, who has often before seen cholera. The disease is not known to have affected the members of the marriage party who came from *Lahore*.

Cholera appeared at Jalálpur, situate nine miles East of the Sadr, on 23rd August and ended on 19th September. There were 50 seizures with 29 deaths. Ten of these sufferers received no treatment, having been seen too late. The first case (Shádi) returned from a visit to *Lahore* and was seized within a week.

The second and third persons affected were close neighbours, who visited Shádi in his illness—and who fell ill on the same day that he suffered. The fourth person was Shádi's son, the fifth was Shádi's sister-in-law, the sixth was mother of the second case, who was Ahmed Din. The last three were seized on the 24th August. The order of seizures and of deaths was as follows:—

	Seized.	Died.		Seized.	Died.
23rd August ...	3	0	2nd September ...	3	1
24th „ ...	4	3	3rd „ ...	1	1
27th „ ...	3	3	4th „ ...	0	1
28th „ ...	5	3	5th „ ...	3	1
29th „ ...	9	3	7th „ ...	0	2
30th „ ...	8	3	13th „ ...	3	0
31st „ ...	6	5	14th „ ...	1	2
1st September ...	0	1	19th „ ...	1	0
TOTAL ...			50	29	

Every effort was made to bring the sufferers out of doors for treatment, and to remove their excreta for burial. No food nor water was allowed to be near them, and sulphur was burned freely near them. The soiled earth was scooped out and carried away and sulphur was burned freely on these places. The bedding and beds of the deceased were burned, those of the survivors were subjected to boiling water. All earthen water vessels that had been used were destroyed outside the town. Sulphurous Acid Gas was freely applied in the drains and streets in the infected part of the town for the whole time of the epidemic.

Seven persons suffered from cholera at Gujrat, between 25th August and 19th September last, of whom five died. The first person had returned from a visit to *Lahore*, and fell ill on the fourth

day after his return. The second person came direct from Wazirabad where cholera existed, and was sent to Hospital from the Railway Platform, suffering with the disease. He was treated in the infected ward outside the town.

Three cases occurred in one household. One woman died in the same lane with the above three who visited the infected household. The last of the seven, a female, visited a family at Kunjah, where a death from cholera had been reported by the Native Doctor, and fell ill seven days after her return to Gujrat. All due precautionary measures were observed to check the spread of the disease. Sulphurous Acid Gas was freely and continuously applied to the houses, streets, and drains in the affected part of the city.

For treatment. One grain doses of Calomel were given every alternate hour. Quinine grains v. dissolved in acid. Sulphuric dil:—every hour, or, it was applied subcutaneously.

Mustard oil with turpentine for friction and *stupes* and *sinapisms* were freely employed. Water was allowed to allay thirst. Stimulants were given only late in the course of the disease.

When the sufferers were seen early in the collapsed stage, these remedial measures were successful in a high proportion. Several succumbed on the third and fourth day from uræmic coma. Early collapse was the rule observed, with less vomiting than was noticed in previous epidemics.

KARNAL DISTRICT.

History of outbreak in the Karnal district.

43. The following statement shows the diffusion of the disease chronologically and locally in the Karnal district.

No.	Police Station.	Town and Village.	Population.	Date of 1st death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Karnal	Karnal T.	24,015	4th Sept.	...	...	...	...	...	...	...	...	1	...	...	...	1	4th Sept.	
2	Gohlah	Dasarpur	216	18th June	...	...	...	...	...	...	...	...	...	...	...	...	2	19th June.	
3	Samalka	Raktara	1,267	5th Sept.	...	...	...	...	...	...	...	...	4	...	...	...	4	23rd Sept.	
4	Ditto	Gohlah Khurd.	950	3rd "	...	...	...	...	...	...	...	...	1	...	...	...	1	3rd "	
5	Ditto	Samalka	1,173	10th "	...	...	...	...	...	...	...	...	1	...	...	...	1	10th "	
6	Panipat	Panipat T.	24,500	13th Augt.	...	...	...	...	...	...	...	...	49	65	...	...	114	21st "	
7	Ditto	Shahidapur	442	2nd Sept.	...	...	...	...	...	...	...	...	1	...	...	...	1	2nd "	
8	Ditto	Sivah	2,060	31st Augt.	...	...	...	...	...	...	...	...	1	...	...	...	1	31st Augt.	
TOTAL					...	...	...	...	...	...	...	...	2	49	74	...	...	125	

The disease appeared in an epidemic form only in the town of Panipat in which, as will be seen from the above statement, 114, out of the total 125 deaths registered in the district, occurred.

Reporting upon the epidemic in this town the Civil Surgeon Dr. Doyle states that the first case occurred on the 11th August, the patient, a Muhammadan male, aged 18, a resident of Atawala, thana Allupur, tehsil Panipat. He went to Panipat to assist at a mela (fair) Urs Kalandar Sahib which began on the 12th August and lasted for three or four days. The Tehsildar writes that about 20,000, excluding inhabitants of Panipat, were present during the mela. At first a quantity of bad meat, &c., was exposed for distribution among the pilgrims—this was as far as possible destroyed. The first case died in the Dispensary, Panipat. Another Muhammadan named Nasir-ud-din proceeded from Karnal to Panipat on the 11th August in the evening. His friends state that he got fever at Gharounda which is half way. He died at Panipat on the morning of the 12th having diarrhoea (as his friend reported) before he died. His age is given as 80. This was not registered as a case of cholera. Second registered case—Karim-ud-din, Kanchan, came to Panipat from Delhi for the mela, attacked on 20th, died 21st. Nawab Fazl Ahmed Khan and Kundan Lal, Banis, Head Clerk, Railway office, arrived at Panipat from Lahore on the 15th or 16th and the 19th or 20th of August respectively, neither of these men however got cholera. A table of seizures and deaths is appended. The majority of those attacked with cholera were Muhammadans but the Muhammadan population of Panipat is greater than the Hindu population.

No meteorological observations have been recorded.

Cattle disease apparently epidemic was prevalent at the time in the villages near Panipat. The Tehsildar writes that this disease caused running from the mouth, swelling of the feet and diarrhoea. The disease began in August, 263 cattle died from this cause during the month.

A similar cattle disease appears to have prevailed in the Rohtak district during January and February 1881. It appeared in the Kuthal tehsil of this district in April and May; in the Panipat tehsil, as above stated, in August, and in the Karnal tehsil in September.

Return showing the number of Patients who drank from the various wells of Panipat during the Cholera Epidemic of 1881.

Number.	NAME OF WELL.				PATIENTS.				REMARKS.
					Hindus.	Muhamma- dans.	Others.	Total.	
1	Uncha Kua	8	36	...	44	First 10 wells inspected by Surgeon General on the 18th January 1882.
2	Nanu wala	...	...	...	2	...	...	2
3	Kaithan	...	...	...	9	...	...	9
4	Kankar wala	...	...	...	3	17	...	20
5	Mashuk wala	...	...	...	2	36	...	38
6	Jogi wala	...	...	...	...	...	...	...
7	Dispensary wala	...	...	...	5	15	...	20
8	Rai wala	...	...	...	2	24	...	26
9	Chamar wala (1st)	...	...	...	...	...	...	...
10	Sweeper wala (1st)	...	...	...	...	...	14	14
11	Darzi wala	6	16	...	22	The wells from 11 to 31 are smaller.
12	Barang	...	...	...	1	9	...	10
13	Kharadian	...	...	...	...	3	...	3
14	Bhuton wala	...	...	...	...	23	...	23
15	Ladla Kua	...	...	...	...	6	...	6
16	Rajon wala	...	...	...	1	...	...	1
17	Mukdum wala	...	...	...	...	14	...	14
18	Ghari Rarian	...	...	...	1	4	...	5
19	Sweeper wala (2nd)	...	...	...	...	...	3	3
20	Rani Mahal	...	...	...	...	7	...	7
21	Bhola wala	...	...	...	2	...	...	2
22	Kazi wala	...	...	...	...	6	...	6
23	Chamar wala (2nd)	...	...	...	...	...	7	7
24	Pir Kumbha wala	...	...	...	1	4	...	5
25	Kathak wala	...	...	...	...	3	...	3
26	Chuna wala	...	...	...	...	5	...	5
27	Kasab wala	...	...	...	...	1	...	1
28	Bhura wala	...	...	...	2	4	...	6
29	Booli Bax wala	...	...	...	...	3	...	3
30	Mali wala	...	...	...	9	7	...	16
31	Takya wala	...	...	...	...	2	...	2
TOTAL					54	245	24	323	

Table showing Cholera Seizures and Deaths at different ages in different classes in the Town of Panipat during the year 1881.

	Under 1 year.		1—12.		12—20.		20—40.		40—60.		60 and upwards.		Total.		Abstract.															
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.																
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.																
Muhammadans	2	2	1	1	49	23	39	13	19	8	12	2	29	16	12	14	4	5	5	6	3	120	71	125	44	245	115			
Hindus	...	...	1	1	11	6	6	2	3	2	5	1	7	2	10	4	6	5	5	1	...	...	...	...	27	15	27	9	54	24
Other *	...	...	...	...	8	3	3	2	2	1	1	...	4	3	6	1	...	...	...	...	...	...	...	...	14	7	10	3	24	10
TOTAL	2	2	2	2	68	37	48	17	24	11	18	3	40	21	68	26	22	17	19	5	5	5	6	3	161	93	162	56	323	149

* Other includes Sweepers and Chamars and other low castes.

GURDASPUR DISTRICT.

History of outbreak in the Gurdaspur district.

44. The following statement shows the diffusion of the disease chronologically and locally in the Gurdaspur district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Date of last death.	REMARKS.					
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Total.				
1	Gurdaspur ...	Gurdaspur T. ...	4,137	2nd Sept.													30	23rd Sept.					
2	Ditto ...	Miani ...	385	5th do.													1	5th do.					
3	Dinanagar ...	Dinanagar T. ...	6,626	17th do.													1	7th Octr.					
4	Kahnowan ...	Gul ...	286	12th do.													1	12th Sept.					
5	Ditto ...	Baloch ...	241	27th do.													3	27th do.					
6	Ditto ...	Jorian ...	147	7th Octr.													1	7th Octr.					
7	Ditto ...	Borman ...	61	8th do.													1	8th do.					
8	Pathankot ...	Pathankot T. ...	4,507	11th Sept.													5	1	1	7	9th Novr.		
9	Ditto ...	Rajah varah ...	268	16th May																1	16th May.		
10	Parmanand ...	Balor ...	596	16th Sept.													1			1	16th Sept.		
11	Madhopur ...	Madhopur ...	168	30th Jany.	1															1	30th Jany.		
12	Kot Nainan ...	Kot Nainan T. ...	1,726	12th Augt.													1			1	12th Augt.		
13	Ditto ...	Miadi ...	186	7th June																6	7th June.		
14	Batala ...	Batala T. ...	26,929	24th Augt.													3	227	30		260	18th Octr.	
15	Ditto ...	Sallo ...	366	6th Sept.																1	6th Sept.		
16	Ditto ...	Divaliwal ...	729	16th do.																2	17th do.		
17	Ditto ...	Moradpur ...	220	13th do.																1	13th do.		
18	Ditto ...	Aliwal ...	792	18th do.																1	18th do.		
19	Ditto ...	Shairpur ...	298	25th do.																1	25th do.		
20	Ditto ...	Shahabad ...	363	27th do.																1	27th do.		
21	Fatahgarh ...	Fatahgarh T. ...	4,481	19th Jany.	1															1	3rd do.		
22	Ditto ...	Jhivargarh ...	1,231	29th Augt.																1	29th Augt.		
23	Dera Nanak ...	Dera Nanak T. ...	7,212	31st Jany.																2	3	25th Sept.	
24	Ditto ...	Sukhchak T. ...	3,246	28th Feby.	1																1	28th Feby.	
25	Ditto ...	Kanike ...	741	27th Jany.	1																1	27th Jany.	
TOTAL ...					1	4		1	6		4	276	39	1			332						

The total number of towns and villages affected was 25 out of a total of 2,302 in the district, but the disease prevailed in an epidemic form only in the towns of Gurdáspur and Batála. The Assistant Surgeon, Bhagwán Dás, gives the following account of the outbreak at Batála:

Record of only one epidemic can be found in the Dispensary books. It occurred in the months of September and October 1875. Total number of cases was 214 with 177 deaths. This was followed by a severe outbreak of malarious fevers in the same way as the present epidemic.

Although four cases of cholera were successfully treated in April 1879 and few were also reported from the rural circle about the same period, the disease did not spread epidemically either in the town or villages; and almost all the cases that came under notice were travellers who had been to Amritsar or Hardwar. The present epidemic seems to have commenced on the 23rd August and ceased on the 17th October 1881. Total seizures were 434, with 287 deaths, but of these 420 occurred in the town, of which 279 proved fatal and 14 in 10 villages situated towards the East of the town as follows:—

Shahabad 3 cases with 2 deaths; Sagarpur, Lakhu Rai each 2 cases with one death; Salochahad Killa Tek Singh and Divaniwal each one case which recovered. Prior to the outbreak the following cases are said to have occurred:—

A young man, who had been to Jullundur, where the disease was at its height at the time, was attacked with cholera at Sagarpur about the 15th and died in the North-eastern portion of the town about the 20th August.

A weaver's child suffering from the disease was brought from Lahore by his parents to the Teli gate near the dispensary on the 22nd August. This child recovered.

A tailor boy who was taken ill at Lahore was brought by his parents to the centre of the town about the 20th August. This boy also recovered.

A weaver of Batála who had been to Lahore only recently was attacked with the disease in the Mian Mohalla on the 20th, and died on the 25th August. The first cases that occurred after these persons entered the town in its various parts were the following:—

(a) The mother of the weaver's child on the 22nd; (b) woman neighbour of the 1st man at Sagarpur on the 25th; (c) a Hindu child near the Teli gate and a Hindu girl in Shibkot (Western part) and a Bhisti girl in Khanda khola (Southern quarter) on the 26th, and (d) weaver woman in the Mian Mohalla on the 27th August 1881.

Of these the persons named in Nos. 2 and 4 and the Hindu girl in No. 3 recovered and the others died. The disease then spread soon and extensively in the Mian Mohalla but slowly near the Teli gate. It was also at the same time confined to a Bhisti family in Khanda Khola in which all the four persons attacked perished. From the Teli gate the disease spread to Kot Kuljas and from the Mian to Majuan Mohalla in both cases taking a Western course. The first cases in Ohari Chauk and Tiha (Central portion) occurred on the 29th of August and then there was a general epidemic throughout the town. The outbreak gradually rose from one or two cases to five on the 1st and up to as many as 23 on the 17th September. It then began to decline till the 2nd of October when only 2 cases were reported. There was then a sudden rise to 15 on the 3rd and then a gradual decline till the 11th when only one case was reported, and then another the last one on the 17th October 1881. Out of 205 villages in the rural circle only 10 situated towards the east of the Police Station or about 5 per cent. were infected. In the Town the East, North, and Western quarters, that were much overcrowded and uncleanly suffered most from the disease.

"Drainage" as far as the town wall extends is as complete as could possibly be, but all outside the wall is for the most part occupied by stagnant pools which increase in number in the rains; the dirty water of the town therefore is not carried away but on the contrary it stagnates and contaminates the atmosphere here for a greater portion of the year, as far as the large streets and "bazárs" are concerned the conservancy of the town was good, but the smaller lanes and houses of the people were not as they ought to have been, urine and dirty water is, in most places, allowed to soak into the earth or left to give off effluvia which contaminate the air the town people breathe. Water for drinking purposes is principally derived from wells in the interior of the town and is generally good; for washing purposes the tanks all round the town are mostly resorted to. "Food" of the people although not rich has generally been good and sufficient "Clothing" dirty and in some cases insufficient. "Dwellings" confined, in most cases overcrowded and uncleanly; and in some insanitary with open drains passing through them, one corner of the house being used for kitchen, the other for a latrine, and perhaps a third as a cowshed. The filth in the latrines is suffered to be kept drying up and giving exhalations from one morning to the other and in a few cases is allowed to dry on roofs. The heavy rains in July and August followed by hot days were the marked meteorological phenomena of the year. The rains were so abundant that every thing outside the walls of the town was under water to some distance so much so that a boat could be taken from the Anárkali Tank round the town and back—several pucca tanks were also submerged. The above in sanitary condition of the town and the heavy rains of July and August followed by hot days supplied all the three conditions necessary for a favorable nidus for the cholera poison to multiply and come into activity. Besides this there are certain other conditions which account for the spread of the disease mentioned below:—

1. The native population is notorious for being uncleanly especially the low classes of Hindus and Muhammadans and the sweepers. Among them daily ablution is an exception rather than a rule; and clothes are perhaps in most cases not washed even once during the month. The houses and court-yards are uncared for. No precaution whatever is taken as a rule to avoid infection. The evacuations are all thrown on the ground and left to dry—or perhaps the place may be washed and cleaned but the washings thrown at random in the court-yard, streets or adjoining drains where they cannot possibly be removed away. Persons, especially middle aged women, with their young children who generally go to condole with each other in cases of death, or, to see a neighbour patient, may sit on the bare floor perhaps soiled with cholera discharges, rub the hands and feet of the sick, and take anything they want to eat without washing their hands; and the young children may pick up food, sweetmeat, or any other similar article lying in the sick room and put it into their mouths. Under these circumstances it is scarcely possible that those who frequent the cholera stricken should not fall victims to the disease.

It will be observed that age and sex has some influence in causing the disease. (a) Children under one year of age almost entirely escaped, only 5 children were attacked; but all proved fatal except one. (b) Children between the age of one and twelve years were proportionally the most affected during the present epidemic. Among these there were 153 cases with 104 deaths, most of these were under eight years of age, and these are the children who accompany their mothers to any place where they may take them. They live on bread, fruits and vegetable, and are therefore more liable to the disease than those under one year, who almost entirely live on milk. (c) Number of persons attacked between the ages of 12—20 was not high nor was the mortality. There were 69 seizures with 32 deaths. The number of males and females was about the same but the disease among the former was more fatal than among the latter. Persons of this age being young, do not, as a rule, frequent the houses of the sick or dead and therefore generally escape; besides, the salutary effects their youth exercises in standing against the deleterious consequences of the cholera poison. (d) Persons between the age of 20 and 40 (especially females) generally visit the houses of the sick and go to condole with each other in cases of death, were more liable to the disease than others, excepting children between the age of 1 and 12 years. Total seizures among these were 134 with 91 deaths. The disease was more common but less fatal among females than among males. (e) Number of persons attacked between the age of 40 and 60 was very small but females still exceed the number of males and were also more liable to fatal results. In this class there were 52 seizures with 39 deaths. (f) Number of persons attacked above the age of 60 was smaller still but the mortality was pro-

The total number of towns and villages affected was 6 out of a total of 851 in the district, but the disease prevailed very mildly, and in an epidemic form only in the town of Ludhiána and the village of Chakkar.

From the report of Dr. Rouse, the Civil Surgeon, which is of the briefest nature, it appears that cholera made its appearance in this district first in Chakkar a village on the borders of the Ferozepore district; 22 persons were attacked with the disease and of these 12 proved fatal. In the first 3 cases the disease attacked persons who had returned from Dhola, a village in the Ferozepore district where cholera was then prevalent, between the 1st and 3rd day after their arrival in their own village Chakkar.

Cholera appeared in Ludhiána town in the month of September 1881; the first four cases of the disease occurred in the Civil Station; the first on the 6th, the fourth on the 13th September 1881, three of which proved fatal. The fifth or the last case occurred on the 17th September 1881. In the town of Ludhiána the first cases, namely two, occurred on the 15th September and the last case on the 29th September. Altogether there were 15 cases in the town, nine of which were fatal.

SIALKOT DISTRICT.

History of outbreak in the Siálkot district.

46. The following statement shows the diffusion of the disease chronologically and locally in the Siálkot district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Siálkot	Siálkot T.	32,989	28th Augt.								6	193	12			211	17th Octr.	
2	Do.	Agoke	1,843	26th Sept.									1	1			2	27th Sept.	
3	Do.	Hajipur	724	22nd "										1			1	22nd "	
4	Do.	Gopálpur	348	25th "										1			1	25th "	
5	Do.	Police line	*	3rd Octr.										1			1	3rd Octr.	
6	Do.	Chohar Chak	*	3rd "										1			1	3rd "	
7	Do.	Tahu	164	27th Sept.										11			11	1st "	
8	Do.	Jail	*	16th "										1			1	16th Sept.	
9	Sambrial	Bhopalwala	3,639	5th Jany.	1												1	5th Jany.	
10	Do.	Sahuwala	3,316	12th April.			1						9	1			11	2nd Octr.	
11	Do.	Sarangi	517	15th Sept.									4				4	21st Sept.	
12	Do.	Dhalam	842	16th "									2				2	17th "	
13	Hardodaska	Jamki T.	4,359	11th "									6				6	26th "	
14	Do.	Bhanoki	300	4th "									1				1	4th "	
15	Do.	Bhadiwala	2,598	2nd "									1				1	2nd "	
16	Do.	Piru Chak	1,493	5th "									2				2	5th "	
17	Do.	Gojrah	2,483	7th "									2				2	7th "	
18	Pasrur	Pasrur T.	8,276	15th "									39				39	30th "	
19	Do.	Kalalwala	*	25th July.						1							1	25th July.	
20	Phalaurah	Chahar	537	16th Sept.									4				4	27th Sept.	
21	Do.	Khananwála	1,187	22nd "									1	2			3	11th Octr.	
22	Do.	Harpal	697	22nd "									7				7	24th Sept.	
				TOTAL	1		1		1	6	272	32					313		

* Not known.

The total number of towns and villages affected was 22, but the disease prevailed in an epidemic form only in the following—Siálkot town, Tahu village, Sahuwála village and Pasrur town. The highest number of deaths occurred in the month of September.

The following details are from the report of the Officiating Civil Surgeon Fattah Singh:—

The first case of cholera in this district occurred on the 26th August 1881, at Bhadoki, a small village in the Siálkot tehsil, situated about 10 miles on the South-west of the town of Siálkot, in the person of a Hindu, who had returned the previous night from Wazirabad, where cholera was said to be prevalent at the time. He was taken ill in the night, and died the next morning. The disease did not spread at all. In September 1875, this village was very severely visited by cholera, when not less than 68 cases and 26 deaths occurred.

In the city of Siálkot, the first case was reported on the 30th August. It occurred in the person of a beggar named Kahna, aged about 45 years, and a confirmed insane; who used to live in the verandah of shops near the tehsil buildings. It is reported that on the 27th of August he ate a large quantity of "chápatís" of different sorts of grain and rice, collected on account of the great Muhammadan festival "Eid," and

drank, as was always his habit, a quantity of filthy water from a pool of stagnant water near the well in the mosque compound situated close to the place where he was stopping. The feeding on the Eid festival evidently deranged his digestive organs, and he got vomiting and purging on the 28th, and was brought to the dispensary by the Police, in that condition, on the afternoon of the same day. His meal on the day of Eid is said to have consisted of chapatis, rice and dall. This man had not lately been to Wazirabad, Lahore, or any other infected locality; nor is there any evidence to show that this man had any intercourse with any man coming from these above-mentioned places; though there can be no doubt that a free traffic was going on (as usual) about this time between Wazirabad and Siálkot, and many persons used to come to the latter from the former town, in almost every part of the town. Kahna, on his admission to the dispensary, did not appear to be suffering from the symptoms of true cholera, but he was placed in a room by himself and carefully observed. On the 30th August his symptoms assumed the appearance of those of genuine cholera; his common bilious stools became like rice water, vomiting set in, collapse supervened, cramps made their appearance, eyes sank, voice became hoarse, and urine totally suppressed. He was then removed to a thatched Cholera Hospital, established about half a mile from the dispensary, on its South-west. This man was very filthy in habits. Almost every astringent drug was tried to check his diarrhoea, while at the dispensary, without any avail. In the Cholera Hospital, he was treated up to 26th September, when after a long struggle he was eventually discharged cured.

On the 31st of August 15 cases were reported simultaneously from different and in some cases quite opposite parts of the town, viz., 1 in the North-west part of the town, 2 in the South-east, 7 near the heart of the town, 2 in the Northern part, 2 in the Eastern and one in the Western part.

The second case that occurred was in Mohulla Bhabarian, in the person of an old woman named Mulo, aged 55 years, living in a very badly ventilated dark house, with foul stagnant air, accommodating also a few buffaloes. She was taken ill probably on the 30th, but was not reported till 31st. No man is said to have come to this house from Wazirabad, Lahore, or any other infected locality; nor did this woman or any of her relatives visit any of these places. The woman died on the 1st September at noon.

The third case occurred in the person of a young boy named Sawan a Hindu, aged 16 years and the son of case No. 2 living in the same house with his mother. He was taken ill with cholera probably on the 30th August, shortly after his mother's illness, and was reported and seen by me on the 31st. This boy ultimately recovered.

In the next door house to that of cases Nos. 2 and 3 cholera made its appearance on the 31st in the person of an old woman named Jai Dai, aged 70 years, who died the next day (1st September), at about 3 p. m. The house in which this woman lived was not in a much better condition, from a sanitary point of view, than that of the adjoining affected one. Another fatal case also occurred in this house subsequently in the person of another woman.

In the same mohalla but a little further 'on to the South-east, another woman was also taken ill on the 31st August, in the morning, but recovered eventually. About a dozen more cases occurred about this mohalla subsequently.

In mohalla Churigarran, a man named Ballu, aged 37 years, living in a small ill ventilated and filthy house, was taken ill on the morning of 31st August and died on the 1st September at midnight. This mohalla is at some distance from mohalla Bhabarian.

The next case occurred on 31st August in the Northern part of the town, in mohalla Arorián, in the person of a boy named Nurdin, aged 4 years, son of Hassu Kashmiri. A large number of ekkás coming from Wazirabad stop near this boy's house. He was taken ill while in good health in the morning and died about midnight.

The next case was a man named Sattar, aged 90 years of mohalla Tibba in South-east part of the town. This man was taken ill on the morning of 31st with the characteristic symptoms of cholera and expired the same day, at about 4 p. m. No one appeared to have come to this mohalla from Wazirabad, nor had this man or any other member of his family or even any person of his mohalla recently been to Wazirabad or any other infected locality. The disease appears to have broken out in different parts of the town quite simultaneously. Altogether 15 cases of cholera occurred on the 31st August, and since that date till 11th October, the disease spread through the length and breadth of the town. No fresh case occurred after the 11th, and no death after the 17th October 1881. During this period, viz., from 30th August to 11th October, no less than 500 cases and 264 deaths have occurred, thus showing that the disease was of a virulent type. The number of seizures and deaths on each day are shown below:—

Date.	Seizures.	Deaths.	Remarks.	Date.	Seizures.	Deaths.	Remarks.
30th August 1881	1	0		23rd September 1881...	11	9	
31st " "	15	5		24th " " "	9	3	
1st September "	16	12		25th " " "	14	3	
2nd " "	21	3		26th " " "	6	7	
3rd " "	22	8		27th " " "	5	5	
4th " "	19	6		28th " " "	1	0	
5th " "	22	7		29th " " "	2	3	
6th " "	12	10		30th " " "	1	1	
7th " "	27	9		1st October " " "	1	0	
8th " "	16	10		2nd " " "	3	2	
9th " "	28	14		3rd " " "	0	1	
10th " "	28	10		4th " " "	1	2	
11th " "	19	14		5th " " "	1	1	
12th " "	26	10		6th " " "	1	2	
13th " "	11	5		7th " " "	0	0	
14th " "	17	8		9th " " "	1	0	
15th " "	21	12		10th " " "	1	0	
16th " "	24	15		11th " " "	1	0	
17th " "	31	17		12th " " "	0	1	
18th " "	13	15		15th " " "	0	1	
19th " "	13	9		17th " " "	0	1	
20th " "	18	14					
21st " "	10	2					
22nd " "	11	7					
				TOTAL ...	500	264	

The caste and sex of these were as follows:—

CASTE.	Males.	Females.	CHILDREN.		TOTAL.
			Males.	Females.	
Hindus	45	63	12	16	136
Muhammadans	121	125	53	43	342
Other Castes	7	10	2	3	22
TOTAL	173	198	67	62	500

The following table shows the different mohallas affected, with the dates of first cases and the total number of seizures in each:—

Date of 1st case.	Mohalla.	Seizures.	Date of 1st case.	Mohalla.	Seizures.
30th August 1881,	Cholera Hospital	†22	4th September 1881,	Pasrah	1
31st " "	Muftian	8	4th " "	Masjid Zargarani	1
31st " "	Tibba Kuke Gaian	65	4th " "	Kanam Garran	3
31st " "	Tibba Jalian	2	4th " "	Kanak Mandi	9
31st " "	Churi Garran	3	5th " "	Masghib Gurh	9
31st " "	Kublalon*	†5	5th " "	Khana Sultan	1
31st " "	Bhabarian*	†5	6th " "	Masjid Kashmirian	7
31st " "	Wasi Shahid Singh	6	8th " "	Chopurian	2
31st " "	Araian	1	8th " "	Muri Darwazah	5
31st " "	Dharawal	39	9th " "	Arazi Yakub	2
31st " "	Luharan	8	9th " "	Afgana	7
31st " "	Anderli Galli	2	9th " "	Bazar Raja Teja Singh	1
31st " "	Ghomoran	3	9th " "	Khatikan	3
31st " "	Kharasian	10	9th " "	Holu Gujar	10
1st September "	Nakhas	32	9th " "	Chauk Purhian	17
1st " "	Kashmirian	32	10th " "	Hakim Hossain Shah	4
2nd " "	Miana Pora	47	10th " "	Mir Sahib	3
2nd " "	Attari	8	10th " "	Undan	5
2nd " "	Rung Purah	9	12th " "	Buchar Khana	11
2nd " "	Sarai Bhabarian	†23	12th " "	Arorian*	†2
2nd " "	Haveli Hakim Rai	1	14th " "	Bhem Sain	1
2nd " "	Sarai Sheik Sandogir	5	17th " "	Kila	1
2nd " "	Porah Neka	16	17th " "	Wazir Ali	4
2nd " "	Jandanwala	6	18th " "	Barahman	1
2nd " "	Dharmasul Nanak Gosain,	3	20th " "	Maksud Khan	1
2nd " "	Shiwala	2	20th " "	Pora Heran	4
2nd " "	Imam Sahib	2	21st " "	Katurian	2
3rd " "	Rang Purah	2	25th " "	Durzian	1
3rd " "	Kashmiri Masjid	1	28th " "	Bhatian	1
3rd " "	Man Pora	3	29th " "	Bazar Chobutrah	1
3rd " "	Duglan	2			
3rd " "	Vedehrian	5			
4th " "	Achargin	2			
			GRAND TOTAL		500

* These mohallas are adjoining.

† These cases actually occurred in different mohallas of the town but were treated at the Cholera Hospital.

In 1872, 64 cases and 36 deaths; in 1875, 2 seizures and 2 deaths; in 1876, 350 cases and 176 deaths; and in 1879, 2 cases and 2 deaths were registered from cholera in the town.

The first case in Cantonment occurred on the 31st of August, in the person of a servant of Captain Cook. This case ended fatally. From 31st August to 11th October 37 cases and 23 deaths were reported from cholera. These figures may be somewhat different from those reported by the Police, owing to the Civil Surgeons not being able to get exact information about the Cantonment cases regularly.

On the 1st of September, a single isolated case occurred at Bhadiwala a village about 26 miles from Siálkot, on its South-west, in the person of a man aged 60 years, resident of Lahore, who had come to the village to give some marriage presents to a Brahmin. He was taken ill at 9 p. m., on the 1st and died at 2 p. m., on the 2nd September. He was removed outside the village, and there treated. No more cases occurred. It is believed that in this single isolated case, the disease was brought in from Lahore.

Another single case that also ended fatally occurred on the 4th September at about 10 p. m. in the person of a Muhammadan, male, caste Gujar, aged 40 years, at the village of Nanoki near Daska, and distant about 23 miles from Siálkot city on its due South. This man was in perfect health, before his illness and at his ordinary meal. He had not been recently to Wazirabad, Siálkot, Lahore, or any other infected locality, nor had any person come to his house from any of these places. He had no intercourse with the Bhadiwala case. He died within a few hours of his illness.

The disease made its appearance at the village of Piru Chack distant about 8 miles from the Siálkot city, on its due South, on the 5th September. Free communication exists between this village and the town of Siálkot. Six cases occurred simultaneously in the different parts of the village on the first day, three of them proving fatal the same day, and the remaining three recovering eventually. There is no evidence of intercommunication among these cases. The village is surrounded by *jhils*.

One case of cholera occurred at Gujrah a large village about 7 miles from Daska on its due West and about 16 miles from Siálkot, on its South-west, in the person of a Hindu, aged 20 years, who had returned to the village from Siálkot (where the cholera was raging about this time), on the evening of the 6th took his usual meal and went to bed all right, was taken ill in the night and died the next day. Another case occurred at this village on the 7th in the person of a Hindu female, but she recovered. No more cases followed.

At Aggoki, a village on the Siálkot and Wazirabad road, and distant about 6 miles from the former town, a Hindu jogi faqir who was coming from Mooltan *via* Lahore and Wazirabad and going to Pathankot in the Gurdaspur district, was taken ill on the 9th September at 6 p. m. and died on the 10th at 5 p. m. In 1879, 5 cases and 3 deaths occurred from cholera at this village.

A rather severe outbreak of the disease occurred at Jamki on the 10th September and lasted till 13th October, during which period 33 seizures and 7 deaths were reported. No fresh case occurred here, after the 13th October. Jamki is a town about 16 miles on the South of Siálkot city. The first case here occurred in the person of a woman aged 20 years, a Brahmini, whose father had returned home on the previous evening, *viz.* 9th, from Lahore, and this woman became affected with cholera on the 10th at 6 a. m. She recovered eventually. The second case also was a woman aged 50 years, a sweepress, wife of Boli taken ill on the 10th at 7 a. m. and died on the 11th at 3 p. m. A man named Nuthoo sweeper is said to have returned to this house from Siálkot on the evening of the 9th September.

A man named Amir Din, aged 40 years and resident of Dhillam, is said to have returned from Siálkot on the 12th September suffering it is reported, from cholera. Immediately after this man's arrival in the village another man named Shádí also became affected with the disease. Both these cases ended fatally. Shádí on the 15th and Amir Din on the 18th. No more cases followed. The village is distant about 13 miles from Siálkot on its South-west.

The next village affected, in a chronological order, was Sarangi about 17 miles from the city, towards its Wazirabad side, and about 3 or 4 miles from the village Dhillam described above. One fatal case occurred in this village on the 14th, one fatal case on the 15th, one fatal case on the 16th, and from that date to 21st September, 5 more cases and one death took place. In all, 8 cases and 4 deaths occurred here in a period of 8 days.

The disease broke out the same day, *viz.* 14th September, at the Municipal town of Pasrur, situated on the Siálkot and Amritsar road, about 19 miles from the former town. The town is very thickly populated with close ill ventilated houses. A tailor named Karim Bax left Siálkot for fear of cholera, went to Pasrur and died there suddenly of

"colic and fever" as it is reported, on the 14th. This appears to be a suspicious case, as on the same day and in the same mohalla two cases of genuine cholera are reported to have occurred, one proving fatal within 12 hours. No fresh case occurred on the 15th but on the 16th 5 cases and 2 deaths occurred.

Cases.			Deaths.		
On the 17th September	...	5	...	3	
" 18th "	...	4	...	0	
" 19th "	...	26	...	6	
" 20th "	...	13	...	7	
" 21st "	...	13	...	5	
" 22nd "	...	9	...	2	
" 23rd "	...	4	...	3	

Cases.			Deaths.		
On the 24th September	...	4	...	0	
" 25th "	...	6	...	1	
" 26th "	...	1	...	3	
" 27th "	...	2	...	2	
" 28th "	...	1	...	2	
" 29th "	...	1	...	1	

and on the 30th no case but one death took place. In all 96 cases and 39 deaths occurred at this town, within a period of 17 days. The sex and caste of these 96 cases are as follows:—

Caste.	Males	Females.	Children.	Total.	REMARKS.
Hindus	1	4	7	12	
Muhammadans	25	29	25	79	
Other Castes	3	2	0	5	
Total	29	35	32	96	

Three cases occurred in the Siálkot Jail. The first case was that of a prisoner named Siálkot Jail, 16th September, Ganda No. 1,721 who was taken ill, in Barrack No. 3, Compartment 2, at first case. 8 a. m. on the 16th September. This man had been in the Jail for about two months. He was apparently in good health before the 15th but during the night of the 15th he complained of some colicky pain, for which the Native Doctor gave him some tincture opii and peppermint water, after which he slept all right during the remaining part of the night. The whole Jail had been placed for some days previously in a very strict quarantine. All the new prisoners, were kept outside the Jail. Apparently there is no evidence of importation from outside. The patient was at once removed to a solitary cell and from thence to a tent pitched in one corner of the Jail garden. He died at 4 p. m. or within 8 hours of the commencement of the disease. The second case occurred in the person of a prisoner named Besakhi, aged 29 years, who was being treated in the Jail Hospital for malarious intermittent fever. He got an attack of diarrhoea on the 17th but as a precautionary measure, he was removed at once to the Jail garden. On the 19th his symptoms assumed the appearance of those of genuine cholera. This man after a great struggle eventually recovered. The third case occurred in the person of a Barkandaz of the Jail contingent guard, who was placed as a guard over two diarrhoea (one of them Case No. 2, afterwards running in to cholera) cases removed to the Jail garden. The man was attacked at 8 p. m., on the 18th and died at 6 a. m., on the 19th.

Two cases of cholera occurred at Zafferwal; the first case was that of a native Christian who returned to Zafferwal from Siálkot, and was taken ill with vomiting and purging, while on the road, and arrived in this condition at Zafferwal Zafferwal, 19th September. on the 19th September. He was seen immediately by the Native Doctor at that place, who pronounced the case to be one of cholera. This man died on the 28th. The other case occurred in the person of a man named Phagu Kahar, who was taken ill on the 27th and recovered eventually. This latter had no intercourse with the former case. No more cases occurred at Zafferwal.

One single isolated case occurred at Hajipur—a small village about $\frac{1}{2}$ a mile distant from the city in the person of a man named Imam Din, the brother of the Barkandaz Hajipur, 24th September. who died of cholera at the Siálkot Jail. It cannot be ascertained, whether this man had any intercourse with his brother at the Jail during his illness.

The village of Tahu distant about 7 miles from the Sadr on its North-east, was affected on the 25th and the disease lasted till 6th October. In all, 15 cases and 11 Tahu, 25th September. deaths have been reported. The first case in this village occurred in the person of a man named Vadhawa, lambardar, who had been to Siálkot a week previously. He was taken ill very early in the morning of the 25th, while apparently in sound health. This man died on the 27th. The next case was that of a woman Shodi, aged 25, caste Mehg, taken ill shortly after the lambardar. She recovered. The third case was that of a woman named Doultey, aged 30 years, taken ill on the 25th and died on the 27th.

The village of Maindurwal is situated above one mile on the North-west of Tahu, the village Maindurwal, 26th September. above described. The first case here occurred on the 26th in the person of a man named Jomay Shah, age 40 years, who was attending on lambardar Vadhawa of Tahu mentioned above. This man died on the 26th a few hours after his illness. The second case here was a man named Nathu a relation of Jomay Shah, aged 25, taken ill on the 26th. He recovered eventually. From 26th September, to 8th October 25 cases, of whom 12 proved fatal, took place.

A single case occurred at the village called Kotli Behram situated near the Western boundary of the Siálkot Cantonment, on the 1st October, in the person of an old Kotli Behram, 10th October. Muhammadan female named Bibi Rani who died on the 2nd. This village is about one mile from the city, and close to the Jail on its North-west.

A daughter of the sweeper attached to the Police line, a little girl of 4 years age, was taken ill while apparently in good health, in her father's house near the Police Sialkot Police line, 3rd October. Hospital, on the morning of 3rd October, and died in the afternoon of the same day. The house was emptied of its occupants at once, floor scraped and the walls and floor leaped a fresh and fumigated with sulphur. No more cases occurred in the lines.

One case of cholera has been reported to have occurred at the village called Thatti Kalán about half a mile from Maindurwal above described, on the 6th. This Thatti Kalán, 6th October. case recovered.

Two Cholera Hospitals were established for the city, with a proper supply of servants, medicines, disinfectants comforts, &c., one near the great Aik Nalla Bridge outside the city, on its East, and the other about half a mile from the Sadr Arrangements made in the city of Siálkot. Dispensary, under a fine tope of Mangoe trees. These Hospitals were intended only to receive those patients who had no friends or were without the means of feeding themselves. All the other cases were treated at their own houses. For the sake of treatment the whole of the city, with its suburbs was divided into four sections. Each placed in charge of a Native Doctor or a Hakim, whose duty it was to attend to and report every case of cholera occurring in his division. Almost every new case was seen by me (Civil Surgeon Fetteh Singh) and I satisfied myself that it was a real case of cholera before registering it as such, at the Dispensary office. Four Hakims and two Native Doctors, besides the Dispensary compounder and dresser, were employed for treating the cholera patients, at their own houses, under my direct supervision. Only one Cholera Hospital, viz. that near the Dispensary was resorted to and 22 cases were treated there. Cholera pills were freely distributed among the Hakims, Native Doctors, and the Police, with directions to use them at once on any person suffering from the preliminary diarrhœa or from indigestions in any form. It is my firm belief that many cases of diarrhœa that would otherwise have gone on to cholera, were stopped in this way. House to house visitation by the Native Doctor, Hakims and other Dispensary subordinates was strictly ordered with the view to discover and treat cases of diarrhœa. Each house after death or recovery of the cholera patient or patients who had been attacked within it, was fumigated with sulphur. Throughout the whole epidemic, quick lime and sulphur were kept constantly burning in various parts of the town, especially those that were severely visited by the disease. At first quick lime was constantly sprinkled in the drains, latrines and houses, but afterwards on receipt of a large quantity of McDougall's disinfectant, it was replaced by that powder.

An annual fair named Goli Shah held (at Koreki, a village in the Pasrur tehsil and about 20 miles from the Sadr on its due South) in the month of September was very judiciously postponed by Colonel Birch for one month or till the disease had quite disappeared from the district, more than 50,000 people are accustomed to assemble at this fair. Goli Shah fair.

Every man in the town believes that the disease was imported here from Wazirabad though there is no direct evidence to prove that this was actually the fact. The circumstances attending the first cases were very carefully investigated; and not only is there no evidence to show that these cases had any direct communication with Wazirabad people, but as far as I know none of the latter who came to this city was subsequently affected with the disease. The first case in the city, at least appears to be of a spontaneous origin, and the disease afterwards broke out so simultaneously in different and in many cases quite opposite parts of the town that there could not have been sufficient time for intercommunication between these cases. Importation of the disease.

The meteorological conditions both before, during, and for sometime after the epidemic did not in any way appear to be exceptional this year. The rainfall however, was rather heavy; in July the rainfall was 8.45, in August 10.25, and in September 2.53 inches. One thing was also noticed that hot sunshining days always showed a large number, comparatively cool and cloudy days decidedly fewer, and as the days became gradually cold in the beginning of October, so did cholera gradually disappear. The heavy dust storm followed by rain on the night of the 17th September, was followed by a decided decrease of the disease. Meteorological conditions.

As mentioned above the sanitary conditions of the house in which the first cases occurred was very bad indeed. The natural drainage of the town of Siálkot is excellent, and the sanitary condition of the main bazárs and lanes was first rate; but the houses, as a rule, were in a very defective sanitary condition, the cattle and the human beings being in many cases housed together. This was particularly noticed in Mianapora and Tibba Kakazayan and it is to be noticed that the largest number of cases occurred only in these two mohallas, viz., 47 in Mianapora and 65 in Tibba Kakazayan. Influence of insanitary conditions.

RAWALPINDI DISTRICT.

History of outbreak in the Rawalpindi district.

47. The following statement shows the diffusion of the disease chronologically and locally in the Rawalpindi district.

No.	Police Station.	Town and Village.	Population.	Date of first death.	MONTHS.												Total.	Date of last death.	REMARKS.					
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.								
1	Rawalpindi	Rawalpindi T.	20,802	10th Sept.													6	25	4		35	27th Novr.		
2	Do.	Phakrail	513	23rd do.													1				1	23rd Sept.		
3	Do.	Vakhay	314	5th Octr.														1			1	5th Octr.		
4	Do.	Kori	2,518	5th do.														1			1	5th do.		
5	Do.	Rahar	209	25th do.														2			2	25th do.		
6	Do.	Saham	704	24th do.														1			1	24th do.		
7	Murree	Murree T.	7,939	24th Augt.													1				1	24th Augt.		
8	Kallar Saidan	Kallar Saidan	2,119	17th Sept.													2				2	29th Sept.		
9	Gujar Khan	Gujar Khan	1,024	12th do.													4				4	19th do.		
10	Do.	Jew Ratial	1,062	17th do.													1				1	17th do.		
11	Do.	Dolmi Dhamal	219	27th do.													1				1	27th do.		
12	Pindigheb	Pindigheb T.	8,223	12th July.													1				1	12th July.		
13	Hasanabdal	Fattah Ullah	410	14th Sept.													5				5	24th Sept.		
14	Do.	Kachh	266	4th Octr.														2			2	4th Octr.		
15	Hazro	Gadlathi	°	20th Augt.													9	1			10	29th Augt.		
16	Do.	Tajah	282	22nd do.													3				3	26th do.		
17	Attock	Attock T.	3,213	7th Sept.													1				1	7th Sept.		
18	Do.	Tiri Tair	462	12th Novr.															18		18	17th Novr.		
TOTAL																	1	10	25	32	22		90	

* Not known.

The total number of towns and villages affected was 18 out of a total of 1,725 in the district but the disease prevailed in an epidemic form only in the town of Rawalpindi and the villages of Tiri Tair and Gadlathi.

The Civil Surgeon of Rawalpindi gives the following particulars of the first cases in some of the places affected :—

On 7th September 1881, a man named Mohan, son of Asa Ram of Jhind, arrived by the morning Rawalpindi town, date of first train from Lahore, and put up in the Serai of the Saigals. At noon he, case. ate watermelon and drank sardai. At 5 p. m. he had vomiting and purging and was removed to the City Dispensary for treatment, where he died of cholera on the 10th September 1881.

The number of cholera cases reported was 57, deaths 35.

Mr. Armstrong an employé of the Punjab Northern (State) Railway arrived here on the 30th Cantonment of Rawalpindi. August 1881, from Lahore by the morning train and while putting up in the Railway Hotel he had vomiting at 6 p. m. The same night at 12 o'clock he had purging and was taken to the City Dispensary at 2½ o'clock a. m., where he remained under treatment and at last died at 5 a. m., 1st September 1881. This was the only death registered from cholera in the Cantonment. There was a suspected case reported by the Police from the Cantonment; it was not, however, registered as cholera.

Phakrail is 8 miles from the Sadr Katchery, date of first case, 23rd September 1881, a syce, name, &c., not known went to Phakrail from the Rawalpindi side and died of cholera. It was the only case there.

Harro Bridge is 37 miles from the Sadr Katchery. On 11th September 1881, one Gaiha Hindu had cholera and died on 12th idem. He is said to have gone to Hasan Abdal and after taking a bath and eating some cold food he became sick of cholera at night. It was very warm that night. The next case was a man named Pheru, who was attacked on 19th September 1881, and died the same day.

Kallor is 23 miles from the Sadr Katchery. Information was received on 18th September 1881, that two women had been to Gujar Khan on business and while returning they were affected with cholera, one died and the other recovered.

Rakh Bag Buta is 17 miles from the Sadr Katchery. On 6th October 1881, Budha Carpenter of this village went home from Rawalpindi and had cholera. He died on 7th idem.

B.—SMALL-POX.

48. The total deaths registered from Small-pox in the Punjab during the year 1881 were only 6,749. This is the lowest number on record since the introduction of the system of registration in the Province. For facility of comparison, I give in the margin the total annual mortality caused by the disease from 1868 to the year under review inclusive. As already stated in the section relating to Vital Statistics, the reduction in small-pox mortality, particularly during the last two years, is most remarkable. Of the total 6,749 small-pox deaths, there were 3,671 of males, and 3,078 of females. Calculated on the census population of 1881, the Provincial mortality is equal to a rate of 3·6 per 10,000 of the inhabitants.

49. The deaths from small-pox mostly occur amongst children under 12 years of age. Thus during the year under review, the mortality of children under that age amounted to no less than 6,304, whilst amongst persons of the age of 12 years and upwards, on the other hand, the deaths registered from the disease did not exceed 445. Or, in other words, out of every 100 deaths amongst persons of all ages, there were no less than 93 that were reported to have occurred amongst the population under the age of 12 years. The corresponding proportion during the previous year 1880 was 91, in 1879 it was 93, and in 1878 and 1877 it was 96 each.

50. In the following statement, the seasonal fatality of small-pox during the year under report, as exhibited by the total number of deaths registered from the disease in each month of the year, is contrasted with that caused in previous years since 1868 :—

Months.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
January	2,649	6,307	2,778	2,138	1,521	1,779	953	874	722	705	2,231	5,779	702	822
February	2,152	6,382	3,038	2,561	1,510	2,027	953	1,176	770	620	2,626	6,250	900	975
March	2,038	7,169	3,362	3,355	2,016	3,598	1,244	1,310	1,127	778	3,565	7,332	1,038	974
April	1,906	6,946	3,582	4,234	2,890	4,138	1,261	1,942	1,432	1,074	4,927	6,396	1,040	831
May	3,456	10,609	4,445	4,724	4,406	5,719	2,382	2,578	1,824	1,542	6,483	9,701	1,196	664
June	3,374	6,768	3,343	3,382	4,310	3,654	1,979	2,182	1,374	1,470	5,243	6,754	1,180	600
July	2,015	3,217	1,987	1,574	2,394	2,077	1,268	1,504	1,090	975	3,877	3,315	717	521
August	930	1,835	902	693	1,349	877	579	606	502	518	2,444	1,744	469	238
September	430	978	543	416	666	379	265	367	340	307	1,225	756	365	246
October	436	582	381	321	471	270	209	284	315	394	984	501	312	285
November	1,163	836	821	616	737	409	351	301	307	1,283	2,258	436	472	237
December	3,210	1,566	1,981	1,520	1,468	772	582	487	451	2,630	4,408	525	754	356
Total	23,759	53,195	27,163	25,534	23,728	25,699	12,026	13,611	10,254	12,296	40,271	49,489	9,145	6,749

The small-pox deaths registered in each month of the year under review, it will be seen, were considerably much below the average monthly rate of mortality obtained in previous years. Apart from this, the only exceptional feature in the monthly distribution of the mortality during the year 1881, is the subsidence of the epidemic much earlier than in former years. Referring to the table, it will be observed that the maximum mortality in 1881 was registered in the months of February and March, while in every one of the preceding years, as shown in the series, the highest number was recorded generally in the month of May. But there seems no particular cause to account for this untimely course of the maximum prevalence of small-pox. An examination of the statistics given in the return of the prescribed series of Annual Forms appended to the Punjab Sanitary Reports for this, and other previous years, will show, that, although in the Province as a whole, small-pox attained its maximum fatality in May in every year since 1868, excepting the one under review, yet taking the several districts individually

CHART SHOWING DEATHS FROM SMALL-POX BY MONTHS IN THE PUNJAB PROVINCE, DURING THE YEARS 1868 to 1881.

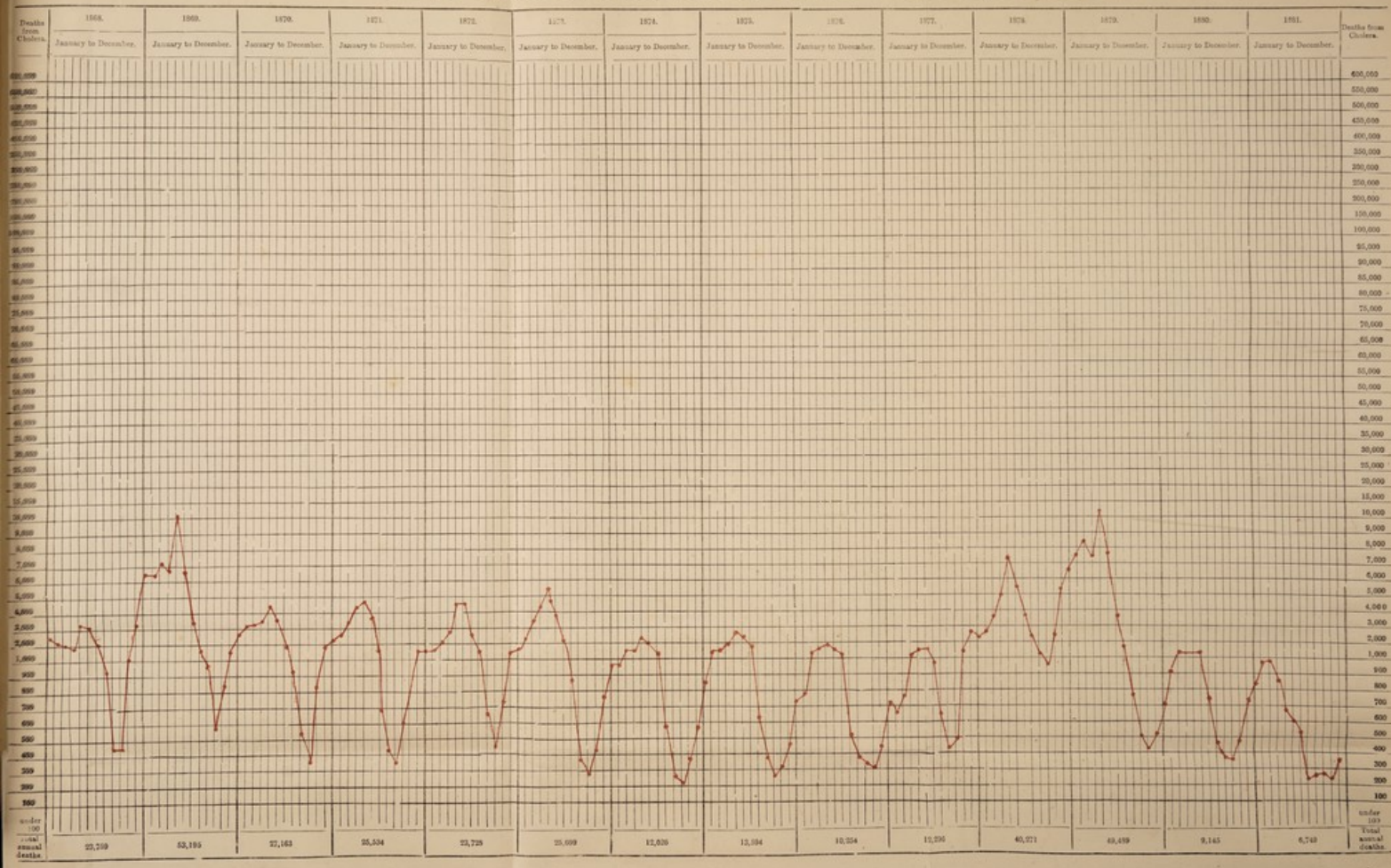


Table showing the deaths from small-pox during the years

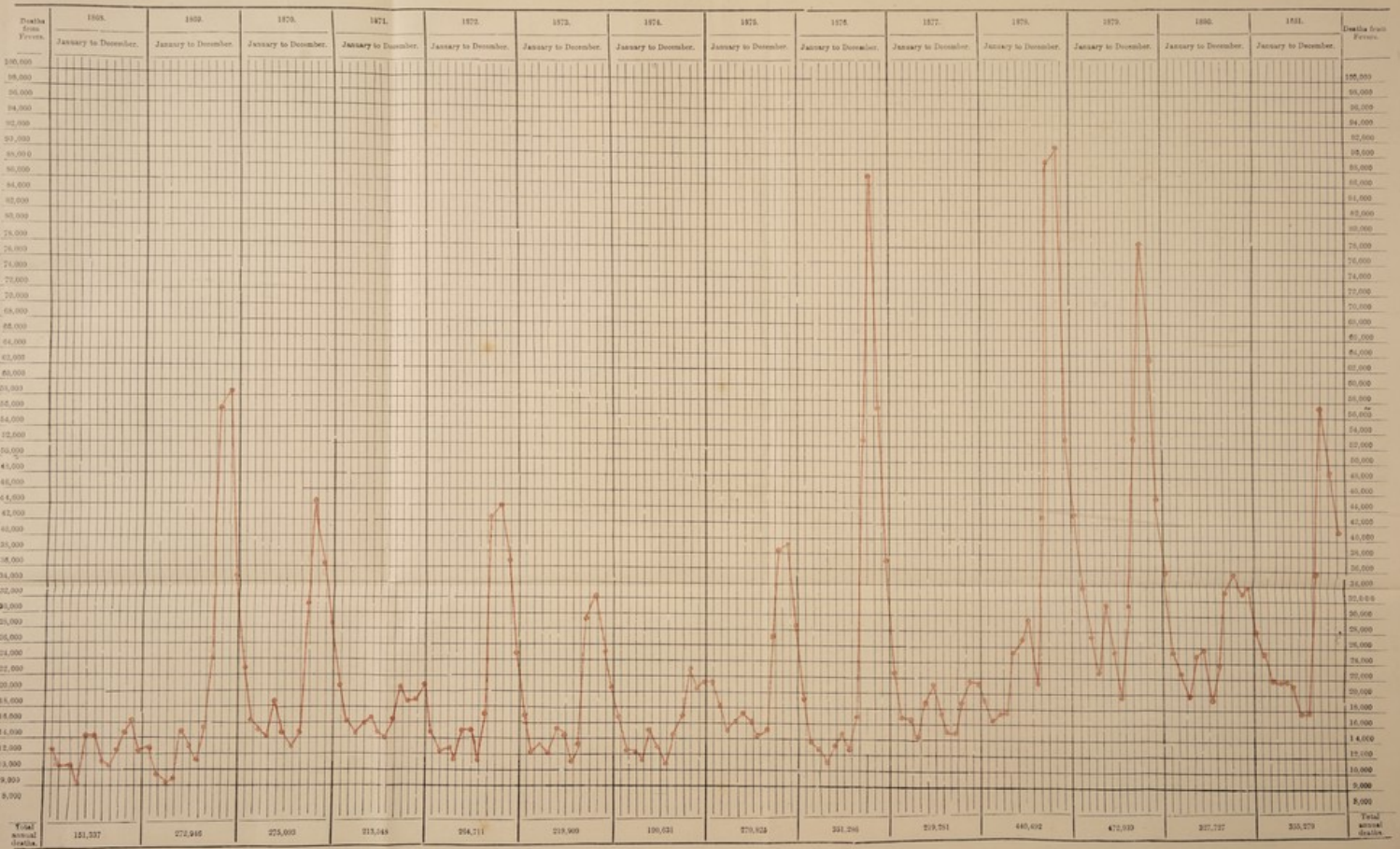
No.	DISTRICTS.	Population according to Census of 1881.	1868.	1869.	1870.	1871.
1	Delhi	643,515	1,249	3,680	629	530
2	Gurgaon	641,848	1,599	7,139	420	775
3	Karnal	622,621	589	770	1,195	1,212
4	Hissar	504,183	141	722	712	1,545
5	Rohtak	553,609	258	2,937	484	369
6	Sirsa	253,275	190	707	548	375
7	Umballa	1,067,263	720	390	892	1,482
8	Ludhiana	618,835	583	616	4,940	25
9	Simla	42,945	2	4	5	...
10	Jullundur	789,555	605	4,339	1,498	118
11	Hoshiarpur	901,381	1,028	3,222	1,844	92
12	Kangra... ..	730,845	70	150	66	75
13	Amritsar	893,266	2,433	5,873	483	1,265
14	Gurdaspur	823,695	949	4,163	622	181
15	Sialkot	1,012,148	2,516	612	1,009	935
16	Lahore	924,106	1,756	5,568	166	491
17	Gujranwala	616,892	1,610	480	47	573
18	Ferozepore	650,519	702	3,311	2,886	91
19	Rawalpindi	820,512	165	36	337	1,377
20	Jhelum	589,373	1,571	435	1,472	3,500
21	Gujrat	689,115	2,372	375	2,174	1,963
22	Shahpur	421,508	1,133	558	1,637	3,029
23	Mooltan	551,964	7	216	245	668
24	Jhang	395,296	142	1,208	1,493	287
25	Montgomery	426,529	599	4,238	112	172
26	Muzaffargarh	338,605	3	28	35	161
27	Dera Ismail Khan	441,649	4	10	44	1,671
28	Dera Ghazi Khan	363,346	1	15	35	130
29	Bannu	332,577	59	103	857	1,438
30	Peshawar	592,674	118	466	596	466
31	Hazara	407,075	524	516	91	436
32	Kohat	181,540	61	308	89	102
	TOTAL ...	18,842,264	23,759	53,195	27,163	25,534

1868 to 1881, inclusive, in each district of the Punjab.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Average annual death rate per 10000 of population
220	779	274	226	27	768	845	12	1	72	10
1,878	945	1,022	2,741	1,263	1,611	6,919	169	15	81	29
473	939	2,292	1,184	580	984	4,006	2,369	459	338	20
92	409	920	546	123	466	679	472	25	15	10
141	866	554	217	19	1,023	917	10	9	51	10
126	345	610	537	262	92	312	629	24	76	14
893	603	2,921	1,907	705	404	2,042	5,246	448	577	13
391	193	348	800	589	425	696	2,444	44	61	14
1	5	5	2	21	...	2	32	...	...	1
380	1,103	141	77	34	8	147	1,010	209	50	9
439	789	117	177	30	11	382	2,028	368	40	8
86	157	58	63	25	34	227	244	30	1	1
2,801	2,303	71	251	794	655	2,957	4,433	50	45	19
1,479	1,983	80	230	26	11	900	3,254	94	34	12
1,314	1,306	57	270	103	20	689	3,158	21	16	8
1,854	1,609	156	424	667	271	3,434	4,516	171	88	16
695	138	87	73	70	66	1,558	2,137	64	30	9
513	3,372	353	296	909	214	582	2,003	94	70	17
547	709	265	145	90	252	1,293	2,614	101	21	7
232	240	53	47	4	38	181	2,406	168	11	12
460	2,181	33	21	12	18	2,119	3,127	21	5	15
327	320	96	292	308	317	673	1,134	799	25	18
2,022	207	20	126	505	475	1,639	235	208	250	9
229	537	240	788	437	102	367	654	104	60	12
1,176	1,994	467	683	147	511	3,086	989	185	148	24
958	118	25	2	86	364	1,007	845	855	244	10
1,182	12	2	26	770	1,084	314	426	2,074	1,250	14
724	135	8	4	137	103	611	603	254	510	6
381	12	5	17	392	1,577	318	410	1,559	572	16
866	590	119	1,018	625	239	750	1,024	446	1,625	11
352	712	501	358	178	15	599	769	4	23	9
496	88	126	46	316	138	20	87	246	360	10
23,728	25,699	12,026	13,594	10,254	12,296	40,271	49,489	9,145	6,749	13

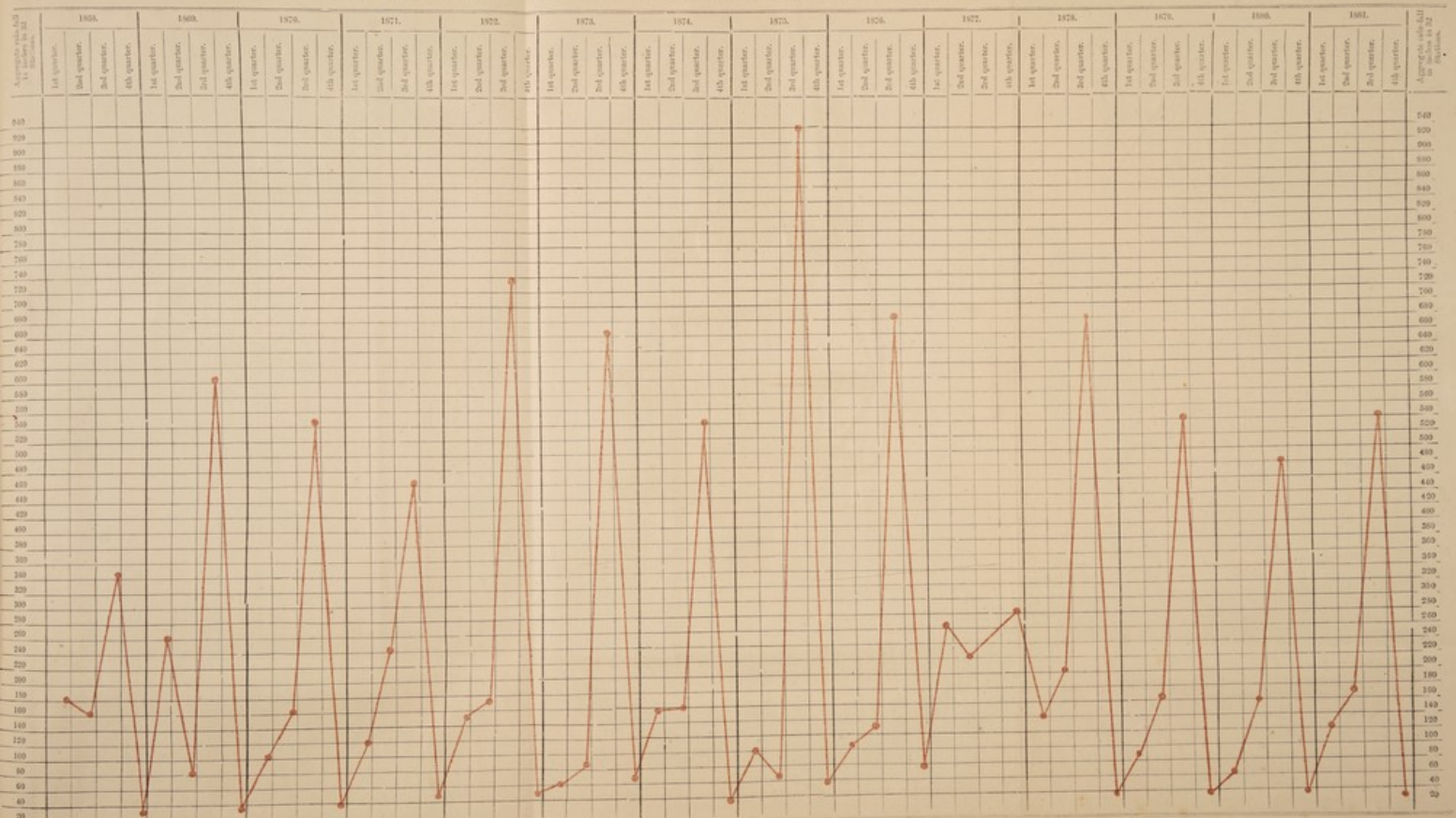
A.

CHART SHOWING DEATHS FROM FEVERS BY MONTHS IN THE PUNJAB PROVINCE, DURING THE YEARS 1868 TO 1881.



B.

Chart showing the distribution of Rain-fall in inches in the Punjab, by quarters during the years 1868 to 1881 inclusive.

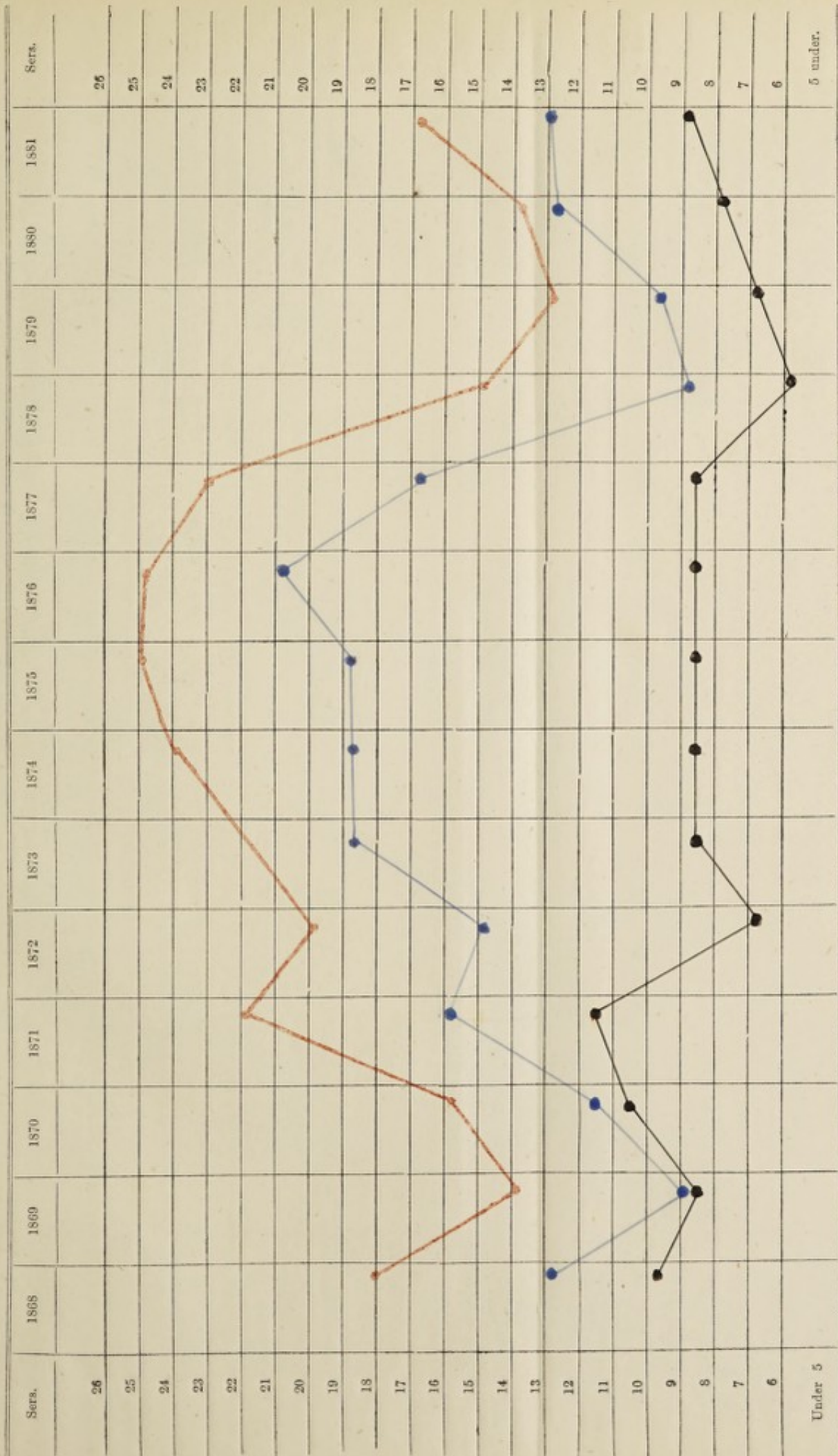


1845

Date	Description	Debit	Credit	Balance
Jan 1	Balance			100.00
Jan 5	Wages	50.00		50.00
Jan 10	Expenses	20.00		30.00
Jan 15	Income		100.00	130.00
Jan 20	Expenses	10.00		120.00
Jan 25	Wages	30.00		90.00
Jan 30	Income		50.00	140.00
Feb 1	Expenses	15.00		125.00
Feb 5	Wages	40.00		85.00
Feb 10	Income		60.00	145.00
Feb 15	Expenses	25.00		120.00
Feb 20	Wages	35.00		85.00
Feb 25	Income		70.00	155.00
Feb 30	Expenses	10.00		145.00
Mar 1	Balance			145.00

C.

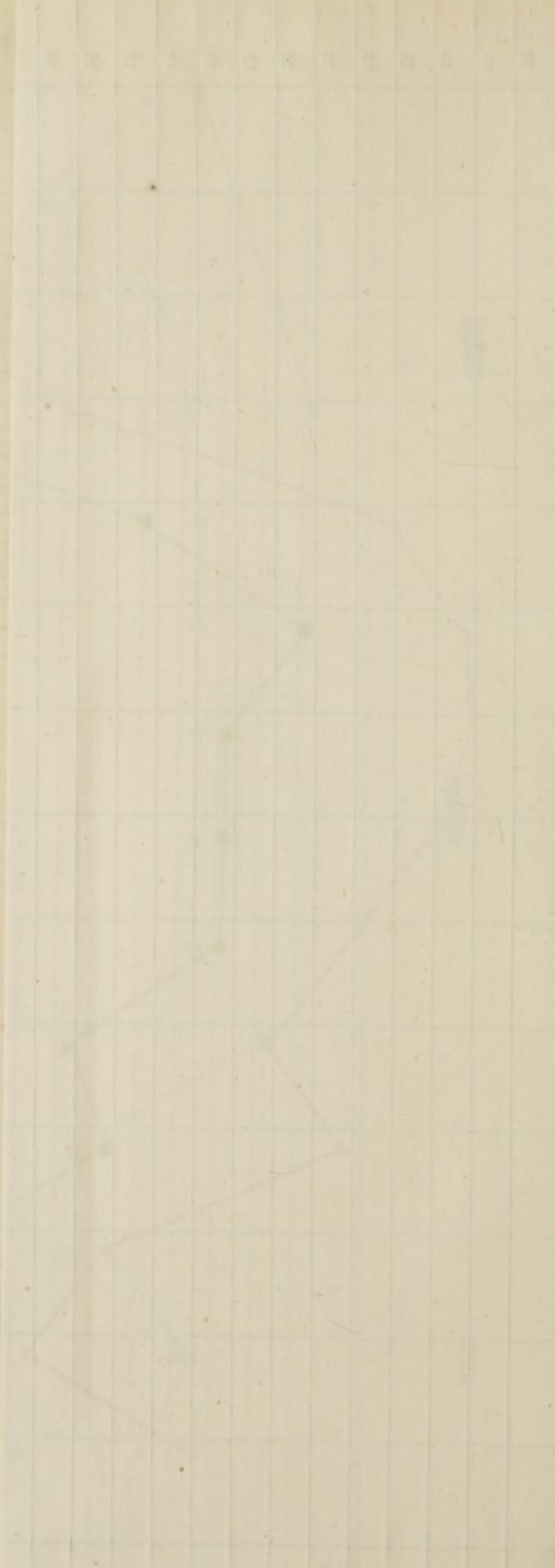
Chart showing the rise and fall in the price of principal food grains during the years 1868 to 1881 inclusive.



Wheat.

Pulses.

Rice.

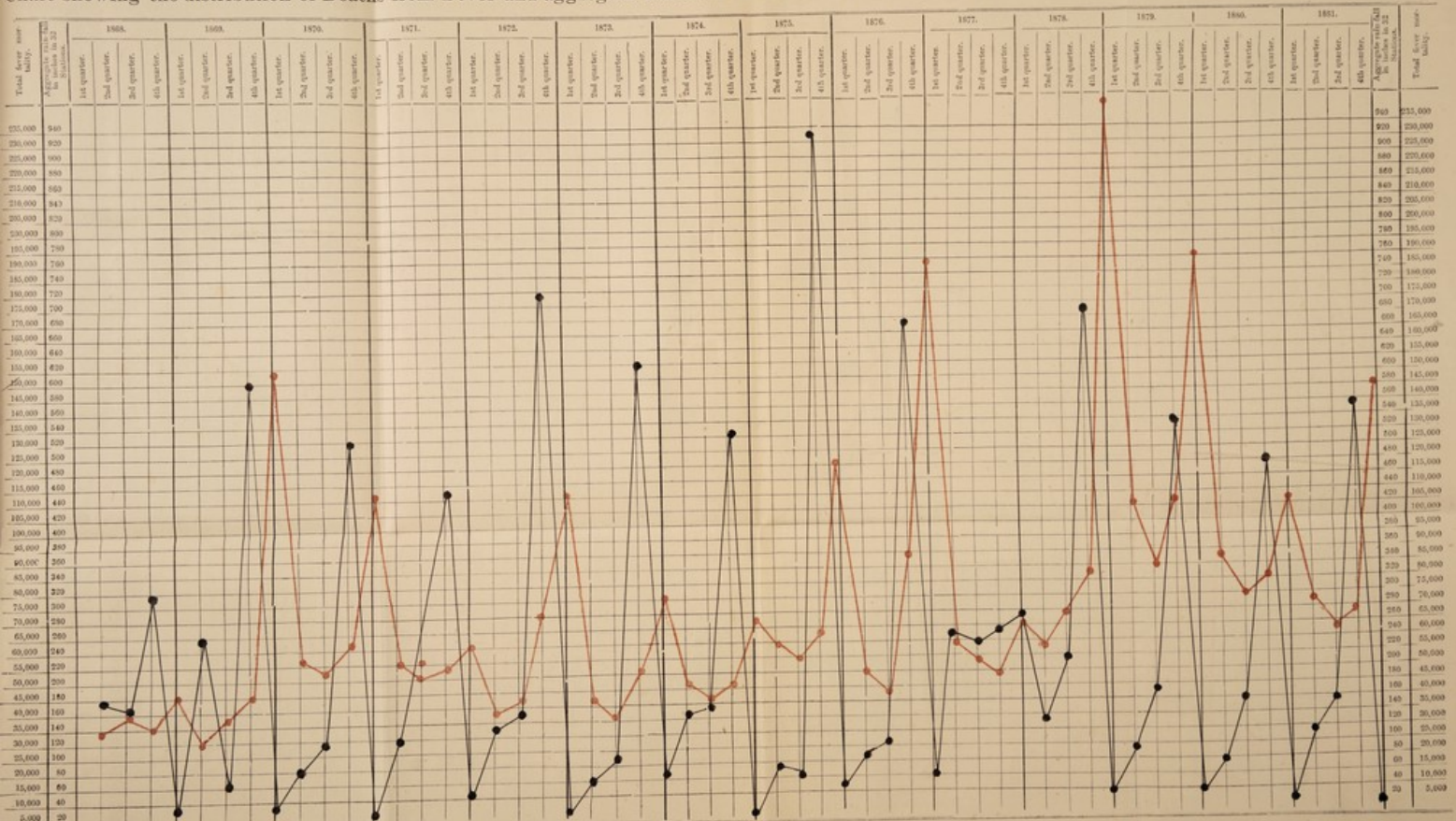


CHITREKAR'S (1961) AND (1962) IN THE LIGHT OF THE DATA OF THE PRESENT STUDY

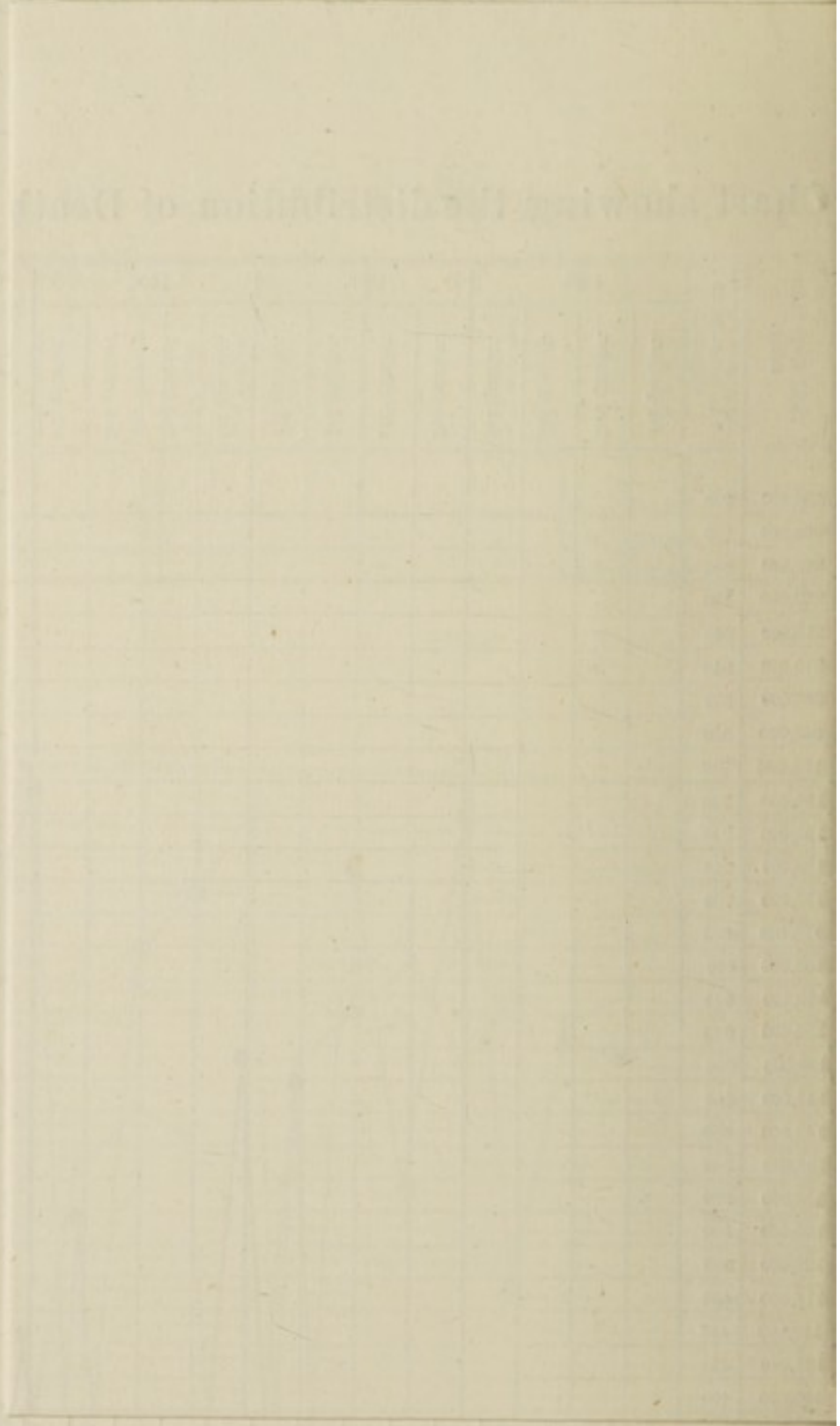
G

D.

Chart showing the distribution of Deaths from Fever and aggregate Rain-fall in inches in the Punjab, by quarters during the years 1868 to 1881 inclusive.



Note.—The black line wave denotes aggregate rain-fall.
The red ditto ditto the total fever mortality.



SECTION C.—FEVERS.

56. In Section VI.—C of my report for the last year, regarding Fevers, I gave a statement showing the total deaths registered under the head of these diseases, side by side with the aggregate rainfall in inches in each month of the years 1868 to 1880 inclusive; together with the average annual price of principal food grains. The facts disclosed by the Fe-ver, Rainfall, and Food-charts given in last year's report. With the view to show very clearly the incidence of fever mortality in this Province in its relation with the rainfall and the rates of the chief articles of food-supply, I appended four Charts, viz., A, B, C, and D. Chart A exhibited the monthly distribution of deaths by fevers in the Punjab during the years 1868 to 1880 inclusive. Chart B represented the aggregate amount of rainfall by quarters. Chart C showed the rise and fall in the prices of the principal food grains during the same series of years. The diagrams A and B were, for facility of reference, contrasted in Chart D. Along with these charts, I gave another tabular statement showing the aggregate rainfall and the fever mortality by quarters, and the average annual rates of the principal articles of diet for each of the 32 districts of the Punjab during the years 1877 to 1880 inclusive.

A careful study of the information afforded by the statistics thus collected together brought to light some very important facts. The statistics proved conclusively that in the Punjab Province, taken as a whole, there exists a very close relation between rainfall and the prevalence of fevers. They showed that heavy monsoons are always followed by destructive epidemics of these diseases, while on the other hand there is a remarkable immunity from them when the monsoon seasons are dry; that the rainfall is invariably excessive every third year, and that in these same third years, the fever epidemics also attain their maximum fatality. Further, an examination of the distribution of fever mortality showed that the intensity of these epidemics is aggravated to a fearful extent by local peculiarities of site and insanitary conditions of the people; that in low lying tracts of the country where, owing to obstruction to surface-drainage, the rain waters do not find their ordinary free exits, the prevalence of epidemic fevers is far greater than in the higher and better drained tracts of country; and that the distress amongst the population caused by the scarcity of food acts very powerfully in deteriorating the standard of health and lowering the powers of vitality and resistance against such forms of disease.

57. I was so much struck with the unbroken continuity in the regularity with which the above results were obtained during the long period extending over a series of 13 years, that in para. 66, of my last year's report I predicted for the current year 1881 an abundant monsoon rainfall, and a more or less severe autumnal fever mortality. This prediction having been literally fulfilled I have reproduced in this section all those diagrams and tables which I gave in the report for the last year, adding to them the statistics for the year under review, in order to facilitate their comparison with those for the previous years. The charts and statements referred to, reproduced for comparison with the statistics for the year under review.

58. In the subjoined tabular statement, the aggregate fever-deaths are given along with the total fall of rain measured in each month of the years 1868 to 1881 inclusive, as also the average annual rates at which the most common articles of diet consumed by the people were available. Statement of aggregate rainfall and fever mortality by months, and the price of principal food grains by years.

Aggregate of Rainfall and total of fever deaths registered in the Punjab, by months, for the years 1868 to 1881, inclusive.

MONTHS.	1868.		1869.		1870.		1871.		1872.		1873.		1874.		1875.		1876.		1877.		1878.		1879.		1880.		1881.	
	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.
January	342	13,398	631	13,596	95	23,296	76	31,430	602	15,146	318	17,075	643	17,170	67	21,284	193	19,815	857	22,411	313	19,507	67	43,248	118	35,681	25	27,660
February	736	10,607	227	9,830	94	16,148	1004	16,450	334	12,667	86	12,781	321	12,637	682	18,534	183	13,570	1024	16,955	837	16,518	64	22,264	486	25,654	393	24,952
March	631	10,440	1784	8,730	773	15,854	43	15,830	462	13,109	249	13,717	556	12,543	103	15,410	690	12,771	506	16,569	73	17,729	622	27,177	64	22,031	783	21,861
April	646	9,122	97	8,869	151	14,561	131	16,614	390	11,827	26	12,291	149	11,265	13	16,224	418	11,973	851	14,011	789	17,390	68	22,066	51	19,394	475	21,383
May	219	14,281	17	15,168	39	18,267	319	17,028	440	15,543	679	15,613	115	15,617	396	17,856	340	13,588	506	18,012	890	25,722	50	21,702	181	24,336	233	21,848
June	661	14,011	606	13,534	1317	15,885	1991	15,596	935	18,868	109	14,867	1178	13,337	346	16,133	364	14,182	721	21,329	216	20,367	1391	24,881	1176	25,262	934	29,801
July	1926	11,763	2754	11,882	1980	13,734	2704	14,281	2683	11,528	3083	11,195	2714	11,565	2397	14,310	2660	12,712	874	17,770	2217	19,576	1698	10,338	2779	18,852	2746	17,423
August	982	11,019	1154	15,807	2338	15,898	1286	15,434	2683	17,862	2988	13,496	1988	14,682	3315	15,164	1839	17,479	368	15,769	3556	20,592	2814	20,903	1105	23,668	2386	17,249
September	246	12,169	2078	24,016	802	31,207	429	29,858	1174	43,826	1083	39,985	866	16,379	3331	27,293	891	53,465	1684	14,328	459	42,943	689	53,492	710	32,501	497	34,326
October	23	15,035	206	56,628	90	44,321	05	19,166	49	45,019	205	32,292	02	23,274	243	48,698	479	87,092	431	18,628	86	89,687	68	78,173	61	35,762	54	56,868
November	..	16,064	61	59,217	..	35,332	..	19,069	05	37,416	18	25,828	..	20,332	102	29,897	124	67,186	763	21,214	..	90,669	..	63,832	51	32,272	..	49,203
December	193	13,428	67	25,186	125	29,793	317	21,083	161	25,128	243	20,700	64	21,540	211	28,691	21	37,467	1358	21,659	54	53,175	228	45,035	320	31,973	28	40,825
TOTAL	6009	151,237	9316	272,946	8604	275,023	8299	213,548	10435	264,711	8131	219,809	8376	190,631	1,1408	273,325	9012	351,256	8213	219,281	9762	440,492	7520	472,333	6981	327,727	8464	355,279

Average Annual price of principal Food grains.

	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
Wheat	18	14	16	22	20	22	24	25	25	23	15	13	14	17
Rice	10	9	11	12	7	9	9	9	9	9	6	7	8	9
Pulses	13	9	12	16	15	19	19	19	21	17	9	10	13	13

It will be seen from this table that a total of 355,279 deaths was registered during the year 1881, under the head of fevers. This shows an excess of 27,552 deaths over the total number, *viz.*, 327,727, returned from fevers last year. Compared with 1878 and 1879, the deaths fall considerably short of the number recorded in those years. In 1878, the total registered mortality from fevers amounted to 440,492, and in 1879 still higher to 472,939, thus showing an increase respectively of 85,213 and 117,660 deaths, in comparison with the number reported to have occurred during the year under review. With the exception of these two years (1878-79) of the great fever epidemics, the mortality in 1881 is in excess of that registered in any one year of the whole series.

The death rates from fevers by months during the year under review does not show any deviation from the usual course in which these diseases are found to have prevailed in the Punjab. The rate of fever mortality in the months of January and February, though much higher than in the following months up to August—being a continuation of the after effects of the previous unhealthy seasons—was, as usual, decidedly on the decline. The autumnal fevers broke out in the month of September, when the registered deaths were 34,396, or double the number (17,249) returned during the previous month of August. The epidemic attained its maximum in October, the deaths registered in that month being 56,868. In the following months of November and December there was, as usual, a steady falling-off in the fever death-rate, though the number of deaths, *viz.*, 49,203 and 40,825, was considerably higher than in any of the first nine months. The aggregate mortality in the sickly months of September to December was 181,292, or more than half the deaths registered in the first 8 months of the year, that is, from January to August.

Instead of comparing the above figures with those for other years, as shown in the table given above, I would refer to the Diagrams, from which it will be seen more clearly, that, as already anticipated, there was a somewhat heavy monsoon followed by an outbreak of severe epidemic fevers during the year under reference. The charts are very instructive and deserve careful study. It is interesting to observe the most striking uniformity in the *triennial* recurrence of the fever epidemics, along with the excessive rainfall.

59. Turning now to the statement of deaths registered from fevers in the several districts of the Province during the year under review, it will be seen that the highest mortality from these diseases was recorded in the district of Amritsar, *viz.*, 28,962, giving a death-rate of 35 per mille of population. Next to Amritsar was the district of Lahore which suffered severely. In this district the total deaths were 21,058 equal to a death-rate of 27 per 1,000. The districts of Delhi, Karnal, Umballa, Mooltan, and Muzaffargarh also had a high death-rate from fevers.

60. In the Amritsar district the city of Amritsar was the greatest sufferer; out of 28,962 deaths from fevers in the whole district, no less than 11,724 are reported to have occurred in the city alone. The occurrence of fever mortality by months, together with the death-rate per mille according to the revised population, in the city and suburbs of Amritsar, as also in the district of Amritsar, will be seen from the following table:—

MONTHS.	Amritsar city (population 144,216).		Amritsar suburbs (population 6,449).		Amritsar district excluding city and suburbs (population 742,601).	
	Total fever mortality.	Death-rate per 1,000 of population per annum.	Total fever mortality.	Death-rate per 1,000 of population per annum.	Total fever mortality.	Death-rate per 1,000 of population per annum.
January	209	17	2	4	949	15
February	154	13	2	4	677	11
March	170	14	0	0	651	10
April	189	16	2	4	511	8
May	193	16	1	2	843	14
June	231	19	2	4	870	14
July	171	14	1	2	586	9
August	286	24	2	4	703	11
September	2,352	196	9	17	1,666	27
October	4,279	356	11	20	3,715	60
November	2,540	211	5	9	3,883	63
December	950	79	0	0	2,147	35
TOTAL	11,724	81	37	6	17,201	23

61. The rise of fevers in the city of Amritsar, it will be observed, was most sudden, and attended by a terrible death-rate during September, the deaths in this month having increased to no less than 2,352 from only 286 in the preceding month of August. In October the deaths rose still higher to 4,279. In the following month of November, there was a great decrease in them, but the rate of mortality was still very excessive, being higher than what prevailed in the month of September. In December, however, there was a very sudden decline, *viz.*, from 2,540 to only 950 deaths. Thus, from the month of September to December there were no less than 10,121 deaths from fevers, exclusive of the mortality from every other cause of disease in the city of Amritsar as distinct from its suburbs. In the district of Amritsar, however, as will be seen from the last two columns of the above table, fevers did not prove so destructive to life as they did in the city, still the death-rate was very much higher than in ordinary seasons. It is particularly to be noted that a like immunity from fever mortality was observed in the suburbs of Amritsar, although they were equally affected by the rainfall with the city itself. The mortality from fevers registered in the intra-mural area during the epidemic months of September to December was as already stated 10,121, or at the rate of 210 per mille of population. In the suburban area the corresponding figures are 25 and 11 per mille of population. The main points of difference between the sanitary conditions of the intra and extra-mural areas are the vastly less density of population in the latter, its far superior conditions in point of sewerage and conservancy, and lastly in the better condition in respect to shelter and food of its inhabitants.

62. The sudden outbreak of the epidemic fevers in the city of Amritsar is attributed to abnormal rainfall in the preceding rainy season. During the months of June, July, and August, an aggregate fall of no less than 62 inches was measured. "The rainfall" says the Deputy Commissioner in his report, "was not only abnormal in quantity, but singularly limited in area extending only a few miles on each side of the city of Amritsar. This excessive rainfall produced disastrous consequences. Owing to obstruction to surface drainage caused by banks of high level canals and rail roads, and also to the city being situated on a lower level than the surrounding country, the rain waters formed large swamps and became absorbed into the ground; the result being an immense rise in the spring level." The Civil Surgeon Dr. Duke, states in his Annual Report that the waters in the numerous wells inside the city rose to an unprecedented height to within a few feet of the surface. The hollow ground around the city and many gardens became flooded and turned into lakes, the water standing in them for months. The civil station and suburbs suffered equally, the compounds of most of the houses being filled with water and saturating the walls up to four feet and more above their foundations. The Jail to the North of the city was flooded, water standing many inches in the workshops. The chief outlet of all this water was the city main drain which is only now partly completed; and being inadequate to carry off the excessive floods, the water level rose, so that outside the city the surface water mixed with well water, while in some places the sub-soil water bubbled up on the surface. According to Dr. Ross, who was acting as Civil Surgeon of Amritsar during the late epidemic, the rainfall broke up and loosened and exposed the stratum of decomposing soil and vegetable matter which always accumulates some feet below the surface of the ground in old cities in this country, and flowing through it polluted the water of the wells. There is no doubt that the sudden rise of the well water stirred up too rapidly the foul matter almost always present at the bottom which in ordinary times is hardly ever disturbed. In forwarding the Civil Surgeon's Fever Report to this office, the Commissioner, Colonel C. A. McMahon, observes:—"The rainfall from June to September was extraordinarily heavy, and the rise of the sub-soil water level was correspondingly great. In the month of May 1881, water was reached at a depth of 12 feet from the surface on digging a kacha well in the Jail. In the month of August Dr. Ross, the Civil Surgeon, at my request made experimental excavations in 15 places inside the Jail, the places selected not being apparently swampy, and he reached the water level at distances varying from 6 inches to 2 feet 9 inches from the surface. During the same month I myself carefully measured the water in the well in my compound (one of the highest sites in the Civil lines) and found that the water in the well to which surface drainage has no access was within 3 feet of the top. With water so near the surface it followed that all the old burying grounds in the place and all the city "Dhābs" into which the sewage of the town used in former times to flow, were more or less under water, and I think there is reason to believe that many of the drinking wells in the city were more or less poisoned in consequence."

63. In Appendix B to the Fever Report submitted to this office by Dr. Duke, the effects of canal irrigation without proper drainage—as pointed out in a letter from Dr. Ross, the late Civil Surgeon, addressed to the Commissioner, as early as in July 1881, are thus described:—"In the opinion of the Civil Surgeon, it certainly seems evident, that the great canals which irrigate this part of the country, as well as that around Meean Meer, as far as Changa Manga, have slowly and certainly raised the sub-soil water level and have to a certain extent altered the conditions of the climate. The level of the water is said to have been raised many feet higher than before the introduction of canals. As regards this statement of Dr. Ross, the present Civil Surgeon made enquiries with the following result:—"The zemindars holding lands and wells to the South side of the Central Jail here, state that the level of the well water has risen considerably with canal irrigation; the rise being judged from the number of *lotas* used in their well wheels. Previous to the opening of the canals, as many as one hundred *lotas* were required to raise the water, whereas now in 1882, only seventy *lotas* are required. The Civil Surgeon further states that Mr. Nicholl, the Secretary of the Municipal Committee has framed a

report in which the depth of the water in the wells is said to have permanently risen to the depth of about 6 feet since the opening of the canals in this part of the country. Mr. Nicholl is also informed by cultivators that the water in their irrigation wells has doubled in quantity in the last 8 or 10 years, that is to say, they formerly required 200 *tinds* or cups for their water wheels, whereas now they require half that number. This is reliable authority and refers to Amritsar and suburbs. That while water has been added without cessation, no drainage exists to carry off the excess, and that year by year the condition becomes worse and worse. That any extra rainfall cannot be absorbed, and that the land in consequence becomes water-logged. As a result of the last rains, the foundations of many important buildings in Amritsar were sapped, the wells sinking down from one to six inches; undergrowth and luxuriant rank vegetation has abnormally increased with a profuse water-supply. Mr. Nicholl gathers from the remarks of one or two Canal officers that the abuse of irrigation in Amritsar does great mischief, and that their efforts to check it are not supported, the natives getting as much water as they like. In the opinion of Dr. Ross expressed in his letter written in July last, the present water-logged sub-soil condition with stagnant pools and marshes and dense jungle combined with a water-level raised most abnormally is precisely similar to a state, which has in other parts of India produced most terrible fever epidemics. It is now long since a neighbouring district was decimated after floods such as have this year occurred in Amritsar, and he feared that a severe and fatal epidemic would take place in the autumn. Dr. Ross significantly pointed out that the great unhealthiness of Karnál, Pesháwar and parts of Delhi district are due to parrallel causes, *viz.*, rise of sub-soil water, and defective drainage."

There is no doubt that in some tracts of country, the canals exercise a baneful influence in lowering the health standard of the people dwelling along their course. I discussed this important question at some length in my Sanitary Report for 1877 under the head of fevers, and showed by an examination of the Vital Statistics that certain towns (Amritsar included) situated on or near the canals had a uniformly higher fever death-rate, and in the aggregate a higher "all causes" death-rate also than the towns situated away from the canals; and further that on the whole they had a somewhat lower birth-rate than the towns in the latter category, although the difference in this respect is not so conspicuous as that between the death-rates of the two opposite classes. And since then, the light thrown upon this question by the facts disclosed by the tabulation, from year to year, of the Vital Statistics of certain selected villages situated on the Western Jamna Canal, as detailed in Section VI. of this Report, has confirmed the conclusion for nerly arrived at in this respect.

64. Before fevers actually broke out in the city of Amritsar, I had warned the Municipal authorities of the imminent danger to the public health, which, from my past experience, I was certain the abnormal fall of rain would bring on; and I had at the same time impressed upon their attention the extreme desirability of taking such precautionary measures as would counteract the fatal influences of the pestilence. The following is a copy of the letter I addressed to the Secretary, Municipal Committee, Amritsar, on the subject, on the 2nd September 1881: "As owing to the obstruction to the surface drainage of Amritsar, the water level in its neighbourhood is extremely high, it is apprehended that the usual autumnal fever will this season be very severe, suggests that medical prophylactic measures be taken as early as possible. In order to resist fever, quinine in small doses of say one grain 2 or 3 times a day dissolved in water with Dil. Sulph. Acid will in the case of many, be a very useful tonic. The general use of tea, instead of cold water which, under the circumstances must be very impure, is highly recommended as a measure to secure the raw water being boiled. Undersigned would therefore like to see tea-sellers being appointed by the Municipal Committee all over the town to enable the poorer classes to buy tea without much inconvenience and at a cheaper rate than what is sold by the shop-keeper. The dust tea which costs about four annas a lb would very well answer the purpose which should be distinctly explained to the proposed tea-sellers."

65 As I was employed on special duty in connection with the Cholera Commission in October, I could not find time to visit the city and make a personal investigation of all the circumstances attending the epidemic which subsequently broke out with such fatal consequences as I have already detailed above. However, in accordance with the wishes of Government, Surgeon-Major John Bennett, M. D., Deputy Sanitary Commissioner, Eastern Circle, was deputed to make the necessary enquiry into the nature and causes of the epidemic. Dr. Bennett's report of the result of his personal observations on the subject has been duly transmitted to Government, and a copy of it is appended to my present Sanitary Report. Dr. Bennett attributes the outbreak to "excessive rainfall, obstructed drainage, rise of the spring-level, and consequent water-logging of the soil." The mortality was heaviest amongst the Muhammadans, or almost twice as high as amongst the Hindus, although the population of both these classes is almost the same. Commencing from 20th August, when the fever began to rise, up to the 31st October, the total deaths amongst Hindus, numbering 66,093, were only 2,572, whereas amongst the Muhammadans, in a population of 66,353, the number was no less than 4,093. "This disproportion between the two classes," says Dr. Bennett "is explained by the fact that a large proportion of the Muhammadan population is made up of poor, ill-fed, and badly clad Kashmiris, on whom the disease fell heaviest and committed its greatest ravages." Further on in his report Dr. Bennett observes "that the vast majority of this class, owing to their inability to earn money to buy food, were found to be in the most impoverished condition, and suffering as much from the effects of chronic starvation as from fevers. Although the poorer classes in all parts of the city, no doubt suffered much from deficiency of food, nowhere did I see the results of poverty and chronic starvation so plainly manifest as amongst the Kashmiri Shawl-weavers." The inju-

rious effects of over-crowding and impure air, deficient clothing, and of "great alternations of temperature, hot days alternating with cold dewy nights" greatly intensified the severity of the epidemic. With regard to the type of fevers "two forms of the disease were met with, common intermittent fever, and the rarer but dangerous remittent form to which so many of the city people succumbed; but between these two there were many gradations partaking of characters common to both." For further particulars I would refer to the report itself.—(Appendix C.)

66. Dr. Ross who was Civil Surgeon when the epidemic was at its height lays stress on the fact of Opinion of Dr. Ross on the re- cholera being associated with the fevers, and makes the following observa-
lation between fever and cholera. tions :— "A remarkable fact about the cholera and fever was that the latter appeared to mask the former. Several cases to my knowledge were treated as "fever," notwithstanding the purging and vomiting, on account of intermissions, or rather remissions of bodily heat. The fever during the height of the epidemic commenced with vomiting and purging. There were remissions without ague, and often without sweating. There was violent headache, suppression of urine and visceral congestion. So similar were the symptoms, that at first the Native Doctors named "cases with suppressed urine as cholera, without as fever." The attack lasted 10 or 12 days and left the patients fearfully prostrate and anæmic with disturbed digestion. Often jaundice appeared as a sequel, a disorder which I have observed following cholera. Those once ill became liable to repeated attacks in October of the ordinary intermittent quotidian or tertian. I observed these phenomena in September 1869 at Kohát, a species of bilious remittent fever masking the commencement of an epidemic of cholera at the same time of the year precisely, followed by ague which lasted in anæmic cases for a year afterwards. The Amritsar fever was worst when cholera occurred, and where the wells were most polluted in the Kashmiri mohallas. The epidemic at Kohát was attributed to the water pollutions, and the Amritsar epidemic occurred in consequence of a rise of the water levels whereby well-water became tainted with organic matter."

67. With regard to measures of treatment adopted during the prevalence of the epidemic, it appears Measures of treatment, &c. from the Civil Surgeon's report that four additional hospitals were opened
adopted by local authorities. in the city. The total number, six in all, were placed under the superintendence of Assistant Surgeon Jaggan Nath, who, with the subordinates under him, performed their arduous duties well, while Municipal Hakims distributed "sharbats." In November and December soup kitchens were opened in various parts of the city, which in the opinion of the Civil Surgeon, helped to save many lives. Besides these measures, a regular system, says the Deputy Commissioner in his report, was organized for the cleansing of wells in rotation, and had been working long before there was any fear of the epidemic.

68. This is not the first time that the city of Amritsar has suffered from epidemic fevers. With the view to contrast the fatality of the epidemic during the year under review with that of the former epidemics, and to show how far those epidemics have been influenced by rainfall, I have prepared the following table showing the mortality from fevers during the sickly months of September to December, along with the aggregate rainfall measured during the rainy months of June to September in the years 1868 to 1881 inclusive.

YEARS.	Fever deaths in September to December.	Aggregate rainfall in inches from June to September.	YEARS.	Fever deaths in September to December.	Aggregate rainfall in inches from June to September.
1868	63	9.6	1875	2,599	38.0
1869	3,044	20.5	1876	5,475	25.7
1870	776	10.8	1877	648	8.8
1871	352	13.4	1878	2,255	24.6
1872	1,317	18.2	1879	1,702	15.4
1873	1,757	16.4	1880	1,112	18.3
1874	1,183	11.8	1881	10,121	67.0

It will be seen at a glance over the above figures that, as in the Province taken as a whole, so in the case of the city of Amritsar, there is a very remarkable uniformity in the *triennial* recurrence of more or less heavy monsoons followed by the prevalence of epidemic fevers, and a very noteworthy absence of these diseases in severe epidemic forms after seasons of scanty rainfall. With the exception of 1876, and another very unimportant one of 1873, the regularity is most marked.

69. The statistics, no doubt, fully establish the very close relation there exists between abnormal A pure water-supply for the rainfall and the excessive prevalence of fevers. And, unless, steps are
city urgently needed, taken to provide some such means as may drain away the immense volume

of rain waters, which at present stagnate in and about the city, and that not only produces deadly malaria, but by absorption into the filthy subsoil of the town site poisons the already polluted well waters, the recurrence of epidemics perhaps more fatal than the one from which the city suffered last year, is inevitable. It is, therefore, to be hoped that the matter will attract the most serious attention of the Municipal Committee. In the absence of a perfect drainage scheme for Amritsar which would require time and a very large outlay I would propose to supply the city with a pure water-supply which may not be subject to contamination on occasions of excessive rainfall, as is the case with the city wells. I have lately received a communication from the Commissioner, Amritsar on this subject which will form the subject of separate correspondence.

70. Of the principal towns next to Amritsar in the order of high mortality from fevers were Lahore, Delhi, and Ferozepore; but in none of them did the fevers assume such enormous proportions as they did in Amritsar. In Lahore especially, as will be seen from Annual Form No. VI. B., the mortality was rather abnormal. Dr. Fairweather, the Civil Surgeon, makes the following observations on the type of fevers that prevailed there:—"In the beginning of August a fever accompanied by a red rash began to be prevalent and it spread through a considerable proportion of the civil community. The onset was generally sudden, and the fever ran high accompanied as a rule with very severe pains through the body and limbs. A rash exactly resembling that of scarlatina soon appeared on the face and spread downwards on the body. This disappeared in the course of 4 or 5 days, sometimes less, and occasionally was followed by efflorescence of the epidermis, I believe this to have been simply what is called "Dengue" when it prevails more generally over the country. There were no catarrhal symptoms resembling measles although this disease was said to have been prevalent in Delhi about the same time or soon after, and of it Dr. Adam Taylor, late Civil Surgeon there, is said to have died. In the absence of any information regarding the symptoms of the so called "measles" which prevailed there, I am inclined to believe it was nothing else than the same disease we had here and I am borne out in this supposition by the histories of the three cases which I obtained, of an officer, his wife, and a man, all of whom caught the disease while passing through Delhi on their way to Bombay at the time of Dr. Taylor's death, and in all of whom the symptoms were exactly those of Dengue. No deaths occurred from the disease in Lahore, but I believe that a fatal termination was only prevented in one instance by large numbers of leeches to the head when apoplexy was threatened.

Along with red fever or Dengue, fevers of the intermittent and remittent type also began to prevail extensively in August and continued throughout September and October."

D.—BOWEL COMPLAINTS.

71. The total number of deaths registered under the head of Bowel Complaints was 17,281, giving a death-rate of about 1 per mille of the population. Of this aggregate number, 1,036 were of males and 6,912 of females.

1868 ...	17,823	1875 ...	27,550
1869 ...	30,953	1876 ...	27,271
1870 ...	27,249	1877 ...	17,664
1871 ...	21,678	1878 ...	32,071
1872 ...	23,345	1879 ...	29,612
1873 ...	19,640	1880 ...	20,736
1874 ...	16,407	1881 ...	17,281

From the table given in the margin, it will be seen that, with the exception of 1874, the mortality from Bowel complaints during the year under review was the lowest recorded in any one year of the series beginning with 1868. Compared with the previous year, there was a decrease of 3,455 deaths.

Deaths from Bowel complaints by months during 1880, 1881.

72. The mortality by months during the years 1880 and 1881 is contrasted in the subjoined statement:—

	1880.	1881.		1880.	1881.
January ...	1,674	1,297	July ...	1,372	1,208
February ...	1,078	1,015	August ...	2,068	1,339
March ...	997	1,033	September ...	2,925	2,025
April ...	1,120	1,119	October ...	2,873	2,265
May ...	1,548	1,260	November ...	2,040	1,914
June ...	1,363	1,186	December ...	1,678	1,620

The table calls for no special remarks, except that, as usual, the deaths from Bowel complaints reached their maximum immediately after the close of the monsoon rains, whilst their minimum fell in February and March.

Deaths from Bowel complaints by districts.

73. In proportion to population the highest death-rate was registered, as usual, in the Simla district, *viz.*, 2·83 per mille.

As already stated, there was a decrease of 3,455 deaths as compared with the previous year. On comparing the number of deaths registered in the several districts of the Punjab, as shown in Annual Form No. X appended to this Report, with the corresponding Return for the previous year, it will be seen that this decline in the death-rate from Bowel complaints was most marked in the district of Kangra in which the number fell to only 1,158 from no less than 2,992 reported to have occurred in the preceding year. In Umballa and Hoshiárpur also, the decrease was considerable, the deaths registered in these two districts being 1,221 and 996, against 1,789 and 1,594, respectively, recorded during the year before.

74. The death-rate from Bowel complaints was considerably higher in the urban, 52 principal towns, as compared with the rural population, *viz.*, 3·38 against 0·79, respectively. The towns noted below suffered very severely from these affections, as will be seen from the death-rate per 1,000 of population given opposite each:—

Death-rate per 1,000.

Palwál (district Gurgáon)	9·37
Kaithal (" Karnál)	6·77
Jagraon (" Ludhiána)	5·64
Hoshiárpur	7·84
Amritsar	7·03
Siálkot	5·61
Rawalpindi	6·39
Pind Dádan Khan (District Jhelum)	6·88

E.—INJURIES.

75. The deaths from "Injuries" are classified under four heads, *viz.*, Suicide, Wounding, Accident, and Snake-bite and killed by wild beasts. First with regard to suicide. There were altogether 263 persons who are reported to have committed suicide during the year under review. As usual, the female deaths under this head exceed the male.

Deaths from Suicide.

The number of deaths according to the different modes in which suicide was committed during the year under review and the one preceding it is shown in the subjoined statement.

Deaths by	1880.		1881.	
	Males.	Females.	Males.	Females.
Drowning	32	56	20	49
Hanging	52	60	59	60
Poisoning by Opium	11	16	12	11
Poisoning by Arsenic	5	3	7	3
Cutting throat	1	2	1	2
Stabbing ... ..	...	...	2	...
Gun-shot wound	4	...	2	...
Falling from heights	4	8	4	2
Setting fire to houses..	2	...	...	...
Causes not stated	21	9	16	13
Total	132	154	123	140

It will thus be seen that "drowning" and "hanging" are the most common modes of committing suicide in this Province. The deaths registered from these causes being 69 and 119, respectively, out of 263 total suicides.

The largest number of deaths from suicide was registered, as usual, in the district of Gurgaon, viz., 9 males and no less than 26 females. Next to Gurgaon, were the districts of Kangra, having 11 male and 16 female suicide deaths, Hoshiárpur, 10 males and 14 females.

76. Under the head of "Wounding" the total deaths registered were 276, against 346 in the previous year. The frontier districts of Pesháwar and Kohát and also Rawalpindi show, as usual, the largest number of deaths from this cause.

77. The classification of the causes of accidental deaths reported to have occurred during the years 1880 and 1881, is given below :—

Deaths by	1880.		1881.	
	Males.	Females.	Males.	Females.
Drowning	1,236	896	1,211	951
Crushed under and falling from roofs, trees, rocks, &c.	724	307	810	404
Lightning	23	8	33	6
Burns	166	186	175	181
Kicks from horses	44	16	60	15
Causes not stated	14	9	9	...
Causes other than those specified above	127	27	78	22
Total	2,334	1,449	2,376	1,579

The statement shows that the total deaths due to accidents of all sorts were almost equal to the number registered the year before, and, further that "drowning" was the principal cause of these deaths.

78. The deaths caused by snake-bite were 1,012. During the previous three years the number was 752 in 1878, 818 in 1879, and 968 in 1880.

The districts of Lahore and Gujránwála show, as usual, the largest number of deaths under this head. The steady increase of mortality from snake-bite, as will be seen from the statistics given above, shows the necessity of taking steps to destroy the poisonous species of snakes all over the Province.

79. From Hydrophobia also the deaths have, of late years, very much increased. The total deaths registered under this head during the year under review being 139 against 107 during 1880, and only 69 in 1879.

Mortality caused by wild beasts: 80. The mortality caused by wild beasts was as follows:—

By Jackals 6 deaths, Wolves 8, Tigers 2, Alligators 2, and a single death from the bite of a cat. There were also 8 deaths registered from the stings of Scorpions, and 23 others the causes of which were unknown.

81. The total number of deaths registered under the head of "All other causes" was 129,568, This includes deaths from Cough and Chest Diseases. The mortality from these chest affections is shown by months in the undernoted table along with the deaths registered during the previous year:—

Deaths from all other causes including those from chest diseases.

	1880.	1881.		1880.	1881.
January	3,321	3,518	July	1,612	1,608
February	3,190	3,435	August	1,677	1,890
March	2,963	3,185	September	1,968	2,510
April	1,909	2,497	October	2,053	2,792
May	2,063	2,142	November	2,274	2,699
June	1,846	1,800	December	2,974	2,828

SECTION VII.—VACCINATION.

82. The revised scheme for the amalgamation of the Vaccine with the Sanitary Department alluded to in para. 105 of my report of last year came into force from Orders of Government on the working of the re-organized vaccine scheme. 1st October 1881. The following correspondence will indicate how the department is to be controlled and worked under the orders of the Local Government:—

Copy of a letter No. 3262, dated Lahore, 10th September 1881, from W. M. YOUNG, ESQ., Secretary to Government, Punjab and its Dependencies, to SURGEON-MAJOR H. W. BELLEW, C. S. I., Sanitary Commissioner, Punjab.

I AM directed to acknowledge the receipt of your letter No. 903S., dated 26th July last, submitting a plan for the re-organization of the vaccination and sanitary establishments under your control.

2. The orders of His Honor the Lieutenant-Governor have been embodied in the resolution, a copy of which is herewith forwarded, in which the principles of the new scheme have been fully set forth; and it only remains for you, in connection with the officers concerned, to give effect to the orders contained in this resolution. You will observe that the expenditure on account of the district staff to be employed in each case will henceforth be met by district and municipal committees. It is, therefore, impossible to embody in the resolution the precise scale of establishment which in the case of each district will have to be entertained. The scale of the establishment must in each case be considered with reference to the capabilities of the different districts, and, although Sir Robert Egerton does not anticipate that any difficulty will be ultimately experienced in obtaining the requisite funds from the sources named, it may not be possible in every case to entertain the full establishment all at once, and some time may have to be allowed to enable district and municipal committees to make provision for meeting the charges imposed upon them by the revised scheme. The Lieutenant-Governor requests that you will place yourself in communication with Commissioners and Deputy Commissioners on this subject. The scale of vaccinators contained in the statement accompanying your letter is generally approved by His Honor the Lieutenant-Governor.

3. The provision for clerks of Civil Surgeons, which will also be met from district funds, is also approved; but His Honor considers that Rs. 20 to Rs. 25 is sufficient for these officials. The appointments of Native Superintendents in the eight districts for which they are proposed are sanctioned; but the Lieutenant-Governor is of opinion that an additional number of these appointments will be required in the case of districts where the number of dispensaries is small, and there will be no Assistant Surgeons or other Medical Officer to carry out the systematic vaccination now contemplated in tracts far removed from the sadar station. The salary of the Native Superintendents will also, as you will observe from the instructions issued in the resolution, be met from District Funds. The establishment of the Deputy Sanitary Commissioners will be paid, as heretofore, from Provincial Funds, including the 24 vaccinators attached to the Eastern and Western Circles for the purpose of keeping up the continuity of operations and preserving lymph throughout the year.

4. Further, His Honor the Lieutenant-Governor, after full consideration of the arguments on both sides, has decided that the compilation of vital statistics must, as hitherto, be performed mainly in your office; and His Honor is willing to sanction such an increase as may be necessary for maintaining the present arrangement in this respect, and also enable you to supervise the additional operations now contemplated. Before, however, finally deciding on the question of this increase, Sir Robert Egerton would be glad to receive from you a financial statement of all the proposals now generally approved, in which the expenditure previously sanctioned should be shown, and the proposals for future charges given separately under the headings of Provincial and District or Municipal charges.

Proceedings of the Hon'ble the Lieutenant-Governor, Punjab, in the Home Department (Medical), No. 3261, dated 10th September 1881.

READ—

Proposed scheme for the re-organization of the Vaccine Department, by Surgeon-Major H. W. Bellew, c. s. i., Sanitary Commissioner, Punjab, dated 7th March 1881.

Memorandum by Surgeon-General S. C. Townsend, c. s. i., dated 9th July, on the above.

Further memorandum by Surgeon-Major Bellew, c. s. i., on the memorandum of Surgeon-General Townsend, c. s. i., dated 26th July 1881, with covering letter No. 903S., dated 26th July 1881.

Demi-Official letter dated 23rd July 1881, from Surgeon-General Townsend, c. s. i., to Surgeon-Major Bellew, c. s. i.

IN March 1880 the Government of India, in the Home Department (Medical), forwarded to this Government copy of a notification, No. 150, dated 15th March, laying down certain orders regarding the revision of the administrative staff of the Indian Medical Department in the several provinces of India. Under these orders, the appointment of Superintendent-General of Vaccination in the Punjab was to be abolished, the Vaccination Department was to be amalgamated with that of the Sanitary Commissioner, and the two superior officers of the Vaccination Department graded as Deputy

Sanitary Commissioners. It thus became necessary to re-organize the Vaccination Department in accordance with the new instructions, and the Sanitary Commissioner was requested to submit proposals for the working of the department accordingly.

In June 1880 the Sanitary Commissioner submitted a scheme for the approval of Government, which, however, did not appear to the Lieutenant-Governor to provide sufficiently for the utilization of the existing medical agency; and His Honor therefore requested Surgeon-Major Bellew to re-consider his proposals in communication with Surgeon-General Townsend, and to re-submit proposals for the re-organization of the Vaccine Department upon a District plan, the Civil Surgeons being made primarily responsible for this branch of the civil medical administration of the district, the whole of which, in its various departments, His Honor desired ultimately to place under their superintendence.

The Sanitary Commissioner's revised scheme, with remarks by Surgeon-General Townsend and a subsequent memorandum by Surgeon-Major Bellew, has now been laid before His Honor the Lieutenant-Governor, and the following measures have received His Honor's sanction.

The general supervision of vaccine operations, the improvement of birth and death registration, the sanitary inspection of towns and villages, and furtherance of sanitary work will be the duties of Deputy Sanitary Commissioners within their respective circles.

Of these circles there will be two,—the Eastern, comprising the fifteen districts of the five divisions from Delhi to Amritsar; and the Western, comprising the seventeen districts of the five divisions from Lahore to Pesháwar inclusive. Each circle will have its own area for carrying on operations throughout the year, taking the plains only in the cold season, and the hills, Simla and Kangra in the Eastern and Murree and Hazára in the Western circle, during the hot weather.

The Deputy Sanitary Commissioners will be guided by the instructions contained in the set of rules framed for this purpose which are appended to this resolution. As these officers will be almost continuously in camp, they will take over the camp equipage of the present Superintendent-General and Superintendent of Vaccination. They will be responsible for the adequate supply of lymph in their respective circles, and will, for this purpose, be required to carry on vaccine operations throughout the year by means of a special staff of vaccinators attached to them. This staff will be independent of the staffs attached to each district for vaccination within its limits, and, for the present, will consist of twelve vaccinators for each Deputy Sanitary Commissioner. The office clerks and peons of the present vaccine establishment will be retained in the employ of the Deputy Sanitary Commissioners.

Although the general superintendence of vaccine operations and the responsibility for adequate supplies of lymph will rest with the Deputy Sanitary Commissioners within their respective circles, the operations of each district will be conducted by the district staff under the superintendence of the Civil Surgeon. For this purpose, an establishment of vaccinators will be attached to every dispensary in the province, and placed under the orders of the Assistant Surgeon or other Medical officer in charge of the dispensary; where no dispensary exists, the vaccinators will be superintended by a native supervisor appointed for the purpose, who will act under the orders of the Civil Surgeon.

During the hot season, when vaccination is impracticable, the staff of vaccinators and supervisors will be utilized by the Civil Surgeon, in communication with the Deputy Commissioner, on sanitary work. Rules for the guidance of Civil Surgeons in regard to the working of the vaccination staff of their districts are appended to this resolution.

As the duties devolving on Civil Surgeons under these rules will necessitate their moving about in camp over the whole of their districts, more especially during the vaccinating season, some provision will in all probability have to be made, as time advances, for their being furnished with camp equipage; and His Honor the Lieutenant-Governor will be prepared to consider these requirements when necessity arises. For the clerical work which the new scheme will entail on them, they will each be furnished with an office clerk.

The strength of the establishment which will be employed under the control of Civil Surgeons will be determined from time to time under orders of Government. This establishment, as shown above, will consist of—

- 1.—Native Supervisor for the tracts in which no dispensary exists.
- 2.—District Vaccinators.
- 3.—Civil Surgeons' clerks.

The cost of this establishment, which will be retained in the district to which it is appointed and utilized either in vaccination or sanitation within its limits, will be borne by District or Municipal Funds. The cost of the Deputy Sanitary Commissioners and their establishment of vaccinators will be borne by Provincial Revenues.

In arriving at the conclusion above stated, that the district and municipal committees should be called upon to bear the cost of the district staff employed in vaccination and sanitary operations, the Hon'ble the Lieutenant-Governor has not lost sight of the fact that hitherto this establishment, so far as it has existed, has been supported mainly from Provincial Revenues. But there are, perhaps, no objects which can with greater propriety be set forward as incumbent upon these committees than vaccination and sanitation. This principle is thoroughly in accordance with all that has been stated regarding the duties of district and municipal committees, and the objects of expenditure to be met from the funds for which they are trustees. The amount of the charges will not, in any case, be found to be excessive, and

Sir Robert Egerton hopes that Commissioners of Divisions and Deputy Commissioners will do their best to introduce, at an early date, the scale of establishment which, in a separate communication, has been generally approved for each district, and which in future should be maintained, subject to such modifications as may be necessary in particular cases, as the future establishment of the district for the purposes indicated. The scale of establishment has been carefully scrutinized, and the cost, which varies in the different districts from about Rs. 700 per annum to a little over Rs. 2,000 per annum, according to the size and population of the districts will, His Honor believes, be met without difficulty, while it will serve to institute much more efficient operations than have hitherto been possible.

It is clear that the success of the present scheme will be promoted by the existence of dispensaries in each territorial sub-division of a district. The presence of the Medical Officer in charge of the dispensary will secure a much more efficient control than could be exercised by a Native Superintendent acting under the orders of the Deputy Commissioner, and visiting from time to time the villages comprised in his charge. Sir Robert Egerton therefore desires to take this opportunity of impressing upon the officers charged with the disposal of district and municipal funds the extreme importance of aiming at the establishment by degrees in every tahsil or important town in the province. Some districts are manifestly ill-supplied with dispensaries. The Ferozepore district contains only one dispensary; Lahore has only two, excluding the Mayo Hospital and Meean Meer dispensary; and in these districts especially the number may with advantage be increased.

It is the desire of His Honor the Lieutenant-Governor that the Civil Surgeon attached to each *sadr* station should be the unit of the civil medical administration, just as the Deputy Commissioner is of the civil administration, and the operations should be conducted through the instrumentality of the medical officers attached to the dispensary, which constitutes the best means of familiarizing the people with European medical science and its attendant benefits. The accomplishment of this object must be a matter of time; but Sir Robert Egerton hopes that the subject will be kept in view by divisional and district officers, and no opportunity lost of utilizing the district and municipal funds upon the construction of dispensaries wherever the need is felt of increasing their number.

In the districts in which the Civil Surgeons hold joint charges, *viz.*, a military as well as a civil medical charge, the supervision which they will be able to exercise over the vaccination and sanitary operations of the district must necessarily be more limited than in other cases, and in all such districts it will be necessary to provide for the appointment of Native Superintendents to act under their orders. The elaboration of the arrangements now proposed, in such districts, may hereafter require that some modification should be made in the medical charges; but at present His Honor desires to utilize the existing agency, and improvements involving extra expense can only be carried out by degrees, as experience shall show that they are necessary.

In conclusion, His Honor the Lieutenant-Governor desires to place on record his thanks to Surgeon-General Townsend, C.B., and Surgeon-Major Bellew, C.S.I., for the pains taken by them in drawing up the scheme now before Government, upon which these orders have been framed.

ORDER.—Ordered that copy of the foregoing resolution be forwarded to the Surgeon-General, Punjab; the Sanitary Commissioner, Punjab; the Deputy Surgeon-General, Punjab Frontier; and all Commissioners and Deputy Commissioners.

Copy of a letter No. 3, dated Lahore, 3rd January 1880, from W. M. YOUNG, ESQ., Secretary to Government, Punjab and its Dependencies, to all Commissioners and Superintendents, in the Punjab.

In paragraphs 11 and 12 of the Resolution of the Hon'ble the Lieutenant-Governor in the Home Department, No. 3261, dated 10th September 1881, it was ruled that the cost of the establishment to be entertained for purposes of vaccination and sanitation under the revised scheme described in that Resolution, would, with the exception of the cost of Deputy Sanitary Commissioners and their establishment of vaccinators, be borne by District or Municipal Funds. The exact amount of expenditure which would thus be thrown upon these funds could not at that time be determined; but the Sanitary Commissioner has recently made detailed proposals to which the Lieutenant-Governor has been able to accord his approval; and I am now to request that you will endeavour to make provision for meeting the charge from the District or Municipal Funds of your division in such proportions as seem fair, with reference to the localities in which the establishments will be entertained.

2. A schedule of the establishment which it is considered desirable to maintain is annexed to this letter. The scale is probably as low as is consistent with the efficient performance of the operations in each department which are required in the several districts, and the Lieutenant-Governor believes that no difficulty will be felt in ultimately meeting the whole cost from either District or Municipal Funds. At the same time, as the scheme involves a considerable increase in the expenditure from these funds, the Lieutenant-Governor will be prepared to make a temporary grant from the Provincial Revenues towards the cost of such establishment in any district in which the resources of the local funds may be insufficient to meet increased expenditure. Applications should be made through the Sanitary Commissioner, and Sir Robert Egerton trusts that they will only be made in cases where the local resources are manifestly insufficient to meet the demands made upon them.

Re-distribution list of Vaccination Staff to be employed in the Eastern Vaccination Circle of the Punjab Province which is to be paid from Municipal and District Funds.

No.	Name of District.	Vaccination Staff sanctioned by Punjab Government Resolution No. 3261, dated 10th September 1881.					Revised list of Vaccination Staff, vide Punjab Government Resolution No. 4384, dated 1st December 1881.					Sanctioned pay of Vaccination Staff under Punjab Government Resolution No. 3261, dated 10th September 1881.					Proposed pay of Vaccination Staff.					Amount originally proposed to be paid by Municipal and District Committees as per statement attached.	Increase.	Decrease.	Amount agreed to be paid by Deputy Commissioners.											
		Supervisor of Vaccination.	Civil Surgeon's clerk.	Class of Vaccinators.			Supervisor of Vaccination.	Civil Surgeon's clerk.	Class of Vaccinators.			Salary of Native Supervisor.	Salary of Civil Surgeon's clerk.	Salary of Vaccinators according to grades.			Total monthly expenditure of Vaccination Staff.	Proposed salary of Native Supervisor.	Personal allowance to Native Supervisors in District in which these officials were not previously nominated.	Salary of Civil Surgeon's clerk.	Salary of Vaccinators according to grades.					Total expenditure of Vaccination Staff.										
1	Delhi	...	1	2	3	5	10	1	1	1	2	3	5	10	...	25	30	36	50	116	141	40	...	181	141	40	...	141	141	...						
2	Gurgaon	...	1	2	3	5	10	...	1	1	3	5	9	...	20	30	36	50	116	136	...	...	15	20	36	50	101	136	...	136	...	136	...		
3	Karnal	...	1	2	3	5	10	...	1	1	3	5	9	...	20	30	36	50	116	136	...	...	15	20	36	50	101	136	...	136	...	136	...		
4	Hissar	...	1	1	2	4	7	1	1	1	2	2	5	...	25	15	24	40	79	104	40	...	...	25	15	24	20	59	124	104	20	...	104	...	
5	Rohtak	...	1	1	2	4	7	...	1	1	2	4	7	...	20	15	24	40	79	99	...	...	...	20	15	24	40	79	99	99	...	...	99	...	
6	Sirsa	...	1	1	2	3	6	...	1	1	2	3	6	...	20	15	24	30	69	89	...	...	15	20	24	30	69	104	89	15	...	...	89	...	
7	Umballa	...	1	2	4	8	14	1	1	1	4	8	13	...	25	30	48	80	158	183	40	...	...	25	15	48	80	143	208	183	25	...	...	183	...
8	Ludhiana	...	1	1	2	5	8	1	1	1	2	5	8	...	20	15	24	50	89	109	40	...	...	20	15	24	50	89	149	109	40	...	...	109	...
9	Simla	...	1	1	1	3	1	...	1	20	15	12	10	37	57	15	...	15	15	57	42	15	...	15	...
10	Jullundur	...	1	2	3	7	12	1	1	2	3	7	12	...	25	30	36	70	125	161	40	...	...	25	30	36	70	136	201	161	40	...	...	161	...
11	Hoshiarpur	...	1	2	3	8	13	...	1	2	3	8	13	...	20	30	36	80	146	166	...	...	15	20	30	36	80	146	181	166	15	...	...	181	...
12	Kangra	...	1	2	3	6	11	...	1	1	1	2	4	...	20	30	36	60	126	146	...	...	15	20	15	12	20	47	82	146	...	64	...	...	...
13	Amritsar	...	1	2	3	6	13	1	1	2	3	8	13	...	25	30	36	80	146	171	40	...	...	25	30	36	80	146	211	171	40	...	...	171	...
14	Gurdaspur	...	1	2	3	7	12	1	1	1	3	7	11	...	20	30	36	70	136	156	40	...	...	20	15	36	70	121	181	156	25	...	...	156	...
15	Sialkot	...	1	1	2	3	9	14	1	1	2	3	9	14	40	20	30	36	90	156	216	40	...	...	20	30	36	90	156	216	216	...	...	216	...
	Total	1	15	25	40	85	156	8	14	20	37	78	133	40	325	375	480	850	1,705	2,070	320	75	305	300	444	780	1,524	2,224	2,070	200	106	...	...	

Re-distribution list of Vaccination Staff to be employed in the Western Vaccination Circle of the Punjab Province which is to be paid from Municipal and District Funds.

No.	Name of District.	Vaccination Staff sanctioned by Punjab Government Resolution No. 3261, dated 10th September 1881.					Revised list of Vaccination Staff, vide Punjab Government No. 4384, dated 1st December 1881.					Sanctioned pay of Vaccination Staff under Punjab Government Resolution No. 3261, dated 10th September 1881.					Proposed pay of Vaccination Staff.					Amount originally proposed to be paid by Municipal and District Committees as per statement attached.	Increase.	Decrease.	Amount agreed to be paid by Deputy Commissioners.						
		Supervisor of Vaccination.	Civil Surgeon's clerk.	Class I.	Class II.	Class III.	Total.	Supervisor of Vaccination.	Civil Surgeon's clerk.	Class I.	Class II.	Class III.	Total.	Salary of Native Supervisors.	Salary of Civil Surgeon's clerk.	Class I. at Rs. 15.	Class II. at Rs. 12.	Class III. at Rs. 10.	Total salary of Vaccinators according to grades.	Personal allowance to Native Supervisors in District in which these officials were not previously nominated.	Salary of Civil Surgeon's clerk.					Class I. at Rs. 15.	Class II. at Rs. 12.	Class III. at Rs. 10.	Total salary of Vaccinators according to grades.	Total expenditure of Vaccination Staff.	
1	Lahore	...	1	3	6	11	1	1	3	6	11	25	30	36	60	126	151	40	...	25	30	36	60	126	191	151	40	...	151		
2	Gujranwala	...	1	2	5	8	1	1	3	5	9	20	15	24	50	89	109	40	...	20	15	24	30	69	129	109	20	...	109		
3	Ferozapore	...	1	1	5	7	1	1	5	7	13	20	15	24	50	89	149	40	...	20	15	24	50	89	149	149	...	149			
4	Rawalpindi	...	1	2	6	11	1	1	6	10	17	25	30	36	60	126	151	40	...	25	30	36	60	111	170	151	25	...	151		
5	Jhelum	...	1	1	5	7	1	1	5	7	13	20	15	24	50	89	149	40	...	20	15	24	50	89	149	149	...	149			
6	Gujrat	...	1	2	9	13	...	...	7	11	19	20	30	24	90	144	164	...	15	20	30	24	70	124	159	164	...	164	
7	Shahpur	...	1	2	8	12	...	...	7	11	19	20	30	24	80	134	154	...	15	20	30	24	70	124	159	154	...	154	
8	Meerut	...	1	1	4	7	1	1	4	7	13	25	15	24	40	79	104	40	...	25	15	24	40	79	144	104	...	104			
9	Jhang	...	1	1	3	6	...	...	3	6	12	20	15	24	30	69	89	...	15	20	15	24	30	69	104	89	...	104	
10	Montgomery	...	1	1	4	6	...	...	4	6	12	20	15	12	40	67	87	...	15	20	15	12	40	67	87	87	...	87	
11	Muzaffargarh	...	1	1	3	5	...	...	3	5	10	20	15	12	30	57	77	...	15	20	15	12	30	57	92	77	...	77	
12	Dera Ismail Khan	...	1	1	2	4	1	1	2	4	7	25	15	24	40	79	144	40	...	25	15	24	40	79	144	144	...	144			
13	Dera Ghazi Khan	...	1	1	3	6	1	1	3	6	12	20	15	24	30	69	129	40	...	20	15	24	30	69	129	129	...	129			
14	Banna	...	1	1	3	5	1	1	3	5	10	20	15	12	30	57	117	40	...	20	15	12	30	57	117	117	...	117			
15	Peshawar	...	1	1	2	4	1	1	2	4	7	25	15	24	40	79	104	40	...	25	15	24	40	79	144	104	...	104			
16	Hazara	...	1	1	2	3	1	1	2	3	6	20	15	24	30	69	129	40	...	20	...	...	...	20	80	129	...	129
17	Kohat	...	1	1	1	2	1	1	1	2	4	20	15	12	20	47	107	40	...	20	15	12	20	47	107	107	...	107			
Total		7	17	21	32	77	130	12	17	30	71	120	280	365	315	384	770	1,469	2,114	480	60	365	285	360	710	1,355	2,200	2,114	200	54	...

Special Vaccine Establishment sanctioned for Deputy Sanitary Commissioners.

83. The Vaccination Staff of the Eastern and Western Circles of the Province under the revised scheme is as follows:—

EASTERN CIRCLE.	WESTERN CIRCLE.
1 Deputy Sanitary Commissioner.	1 Deputy Sanitary Commissioner.
1 Native Deputy Superintendent of Vaccination.	
8 Supervisors of Vaccination.	12 Supervisors of Vaccination.
14 Civil Surgeons' Clerks.	17 Civil Surgeons' Clerks.
20 1st Class Vaccinators, 5 of whom receive a personal allowance of Rs. 15 per mensem and perform the duties of supervisors of vaccination.	19 1st Class Vaccinators, 4 of whom receive a personal allowance of Rs. 15 per mensem and perform the duties of supervisors of vaccination.
37 2nd Class Vaccinators.	30 2nd Class Vaccinators.
78 3rd Do. do.	71 3rd Do. do.

To the above should also be added the Special Vaccination Staff of the two Deputy Sanitary Commissioners consisting of 4 1st Class, 8 2nd Class, and 12 3rd Class Vaccinators, who are paid from Provincial Funds. Omitting the salary of the two Deputy Sanitary Commissioners, a question which is at present under the consideration of the Local Government, the monthly cost of the revised scheme under Provincial, Municipal and District Funds, is as noted below:—

VACCINATION STAFF.

Provincial Funds	1 Deputy Superintendent	...	...	Rs. 150
	Travelling allowance	...	...	45
	4 Vaccinators @ 15 Rs. each	...	...	60
	8 Do. @ 12 " "	...	...	96
	12 Do. @ 10 " "	...	...	120
	TOTAL			471
	<i>Office Establishment.</i>			
	2 Clerks, @ 50 Rs. each	...	...	100
	4 Chaprassis, @ 6 " "	...	...	24
	TOTAL PROVINCIAL FUNDS			595
Municipal and District Funds	20 Supervisors, @ 40 " "	...	...	800
	39 Vaccinators, @ 15 " "	...	...	585
	67 Do. @ 12 " "	...	...	804
	149 Do. @ 10 " "	...	...	1,490
	Personal allowance to 9 1st Class Vaccinators @ 15 Rs. each	...	...	135
	TOTAL			* 3,814
	<i>Office Establishment.</i>			
	31 Civil Surgeons' Clerks, @ 25 and 20 Rs. each	...	...	670
	TOTAL MUNICIPAL AND DISTRICT FUNDS			4,484
	GRAND TOTAL PROVINCIAL, MUNICIPAL & DISTRICT FUNDS			5,079

* Of this sum a small portion is contributed from Provincial funds, vide sanction accorded in Punjab Government Nos. 932 and 936, dated 8th April 1882, to address of Commissioners, Lahore and Mooltan Divisions.

84. The resolution of the Punjab Government above given was received in this office on 22nd September, or only 9 days before the scheme was to have come into operation, and it is therefore well to note here that in some districts vaccination work was not fairly started till the end of November or beginning of December. This delay, however, was unavoidable and was due chiefly to the time occupied by the vaccinators in joining the districts to which they were posted. Nevertheless the outturn of work accomplished by the different vaccination establishments during the current year ending 31st December 1881, as compared with the past official year ending 31st March 1881, is very satisfactory as will be seen from the Annual Vaccination Statements appended to this section of the Report.

85. The change in the compilation of the vaccination returns from the official to the calendar year, has been made with a view to secure uniformity with the Annual Vital Statistical Returns, and, also, to save unnecessary delay in the publication of the Annual Sanitary Reports, which, under the recent orders of Government, have to be submitted in future by 1st June of each year.

86. The first statement appended to this Section of the report shows particulars of vaccinations performed throughout the Province by the vaccinators of the late Punjab Establishment, during the six months preceding the introduction of the new system of district work which took place in October last, and up to which time the general supervision of the vaccination arrangements having been carried out by Surgeon-Major J. Bennett, Officiating Superintendent General of Vaccination the whole of the returns were tabulated in his office. In the districts of Kangra, Simla, Hazara, and in the hilly portion of Rawalpindi, together with the 12 Native States, operations were carried on during the hot season; while in the other districts shown—those situated on the plains—the work continued from the previous season was for the most part brought to a close in the month of April.

Statement No. II, shows the dispensary vaccinations performed in the period embraced by the six months preceding the introduction of the changes in the working of the department, as well as the operations performed in the Cantonments of Umballa, Sabathu, and Meean Meer.

The following particulars on the vaccine operations performed throughout the Province during this period has been furnished by Surgeon-Major J. Bennett, Deputy Sanitary Commissioner, Eastern Circle, who held charge of the vaccination department up to that date.

87. The aggregate number of operations performed by all establishments during the six months ending the 30th September is 143,178 the number of primary operations, known to be successful, being 101,394, and of successful re-vaccination 19,014, the ratio of success in the former class of cases, including unknown as unsuccessful is 94.29, and excluding these 97.91 per cent, while that in the latter is 53.34 including unknown, and 62.29, excluding these.

The number of persons vaccinated by the Provincial Establishment was 105,223 primary vaccinations, and 35,495, re-vaccinations, total 140,718. Of the primary operations 99,409, were returned as successful, the percentage of success being 94.47, including unknown, and 98.11 excluding these from the total; of the re-vaccination cases 18,907, are said to have been successful, the ratio being 53.26 per cent. when the unknown cases are included in the calculation, and 62.29, when these are excluded; but as it not unfrequently happens that it is a matter of some considerable difficulty to pronounce as to the success or otherwise of many re-vaccination cases, the returns of the vaccinators in this respect are not altogether reliable. Of the 4,323 operations inspected by Dr. Bennett during the six months under review, 1,966 were primary, and 2,357 were secondary operations, the respective percentages of success noted being 98.52 and 52.99, figures which show that in the former class of cases at least, the ratios returned by the vaccinators have not been overstated.

The total expenditure during six months. The total expenditure during the six months, was Rs. 30,471-15-9, and the cost of each successful case was 4 annas and 1.44 pies.

88. The Provincial Establishment consisted of 1 Native Deputy Superintendent, 33 Native Superintendents, and 135 vaccinators; on an average 14 Native Superintendents and 59 vaccinators were at work in the hills throughout the six months in question. Dr. Massy held charge of the office of Deputy Sanitary Commissioner, of the Western Circle. During the hot weather embraced in the six months operations were conducted in 12 Native States, in Simla, Murree and the adjoining hills, and in the districts of Kangra and Hazara; operations were also performed in 16 districts in the plains during the early part of April, but only to a limited extent, as they had to be brought to a close on account of the heat.

89. The subjoined table shows the numbers vaccinated in the various districts situated in the plains during the period under report.

With the exception of Delhi the operations in the accompanying table were performed in the month of April, the work in the plains having been brought to a close about the end of that month. In the district of Delhi small-pox having made its appearance in the tahsil of Ballabgarh operations, which had been discontinued in the early part of April, were resumed about the end of the month, and carried on into June, but with unsatisfactory results; many of the cases proved unsuccessful, and the people showing great unwillingness to subject their children to the operation (which even under the most favorable circumstances, has never been popular in these parts), but little work was accomplished.

District.	Total number vaccinated.	District.	Total number vaccinated.
Delhi ...	1,073	Ferozepore ...	256
Gurgaon ...	113	Rawalpindi ...	968
Hissar ...	679	Gujrat ...	498
Sirsa ...	350	Shahpur ...	541
Ludhiana ...	497	Mooltan ...	361
Jullundur ...	1,331	Jhang ...	7
Amritsar ...	11,292	Muzaffargarh ...	2,702
Gurdaspur ...	1,300		
Lahore ...	1,460	Total ...	23,728

Amritsar district.—Exhibits the highest proportion; this is to be attributed to the fact that a staff of 34 vaccinators was at work, while in the other districts only 1 Native Superintendent and 4 vaccinators were employed in each.

Simla district.—In the sanitarium of Simla 1 Native Superintendent and 4 vaccinators were at work during the whole of the hot season, performing a total of 768 vaccinations against 250 of the previous year; this increase was brought about by the unusually large number of re-vaccinations (366) performed: in primary cases, the percentage of success is 97.51 including unknown while the actual ratio, that found when the unknown cases are thrown out of the calculation, rises to 99.74. In the rural circles of the district, operations were confined to the Sanitaria of Dagshai and Kasauli, the total number of persons vaccinated being 168.

Kangra district.—Vaccine operations were continued here throughout the hot season the whole of the district with the exception of certain portions of the Kulu Sub-division, having been overtaken. Up to the end of July a staff of 8 Native Superintendents and 31 vaccinators were employed; in August 4 Native Superintendents and 18 vaccinators and in September 2 vaccinators, the aggregate number of operations performed being 66,985. This is probably the best vaccinated district in the province, the result being that the mortality from small-pox, for the last two years, has been reduced to very small proportions; in 1880 the number of deaths registered from the disease was but 30, and in 1881 only one fatal case was recorded. The practice of inoculation, formerly so rife in these parts, was in complete abeyance during the past year, and to this, as well as to the almost universal acceptance of vaccination, is due the trifling mortality from small-pox here recorded. Great assistance was received from Colonel Jenkins, the Deputy Commissioner, who, as in former years, continues to take the greatest interest in the work of vaccination, and to use his best influence in furthering its spread among the people; to him, in no small measure, is due the satisfactory results attained, and the high degree of protection from small-pox reached in this district. The table given in the margin shows the distribution of the work in the different tahsils. The proportion exhibited by Hamirpur is unprecedentedly high, and due

Tahsils.	Total number vaccinated.	Ratio of successful cases per 1,000 of population.
Kangra ...	13,474	48.87
Nurpur ...	9,559	55.81
Dehra ...	9,607	56.73
Hamirpur ...	30,725	132.80
Kulu ...	3,620	30.99
Total ...	66,985	69.41

primary cases the percentage of success was 94.43 including unknown cases, and excluding these, 98.41.

Native States.

90. The Native States given in the accompanying table were visited, and for the most part overtaken.

The total number of vaccinations in the 12 States here shown was 35,951 of which in

Native States.	Total number vaccinated.
Patiala ...	306
Bashahar ...	10,453
Baghat ...	888
Jubal ...	1,277
Kumarsain ...	108
Lambagraon ...	1,465
Kutlahar ...	13,777
Nadaun ...	4,674
Guler ...	698
Balsan ...	243
Kuthahar ...	350
Umb ...	1,712
Total ...	35,951

primary cases the percentage of success, including unknown, was 94.86, and, excluding these from the calculation 98.07. The people of these States are not unfavorably disposed to vaccination, except in so far as infant vaccination is concerned; remembering the occasionally disastrous results arising from inoculation which, in former years, used to be so freely practised, the inhabitants of these hills strongly object to having vaccination performed on infants, under a year, while they show no reluctance in bringing forward children over that age. In certain parts of Bashahar State there is a strange prejudice against vaccine operations being performed in the months of April and May, when the number of traders passing down from Thibet is greatest. Vaccination, as these people think, being almost identical with small-pox, if not the same disease, is considered by them to be contagious, and therefore likely to spread if practised, when so many people are passing along the road. The Raja has always shown great willingness to having vaccine operations carried on in his State; but at the commencement of the work, difficulties were raised by his officials, and much time was lost before they were prevailed upon to countenance the vaccinators, and to give them the necessary assistances. Ultimately, however, owing to the efforts of Pandit Balkishen, the Deputy Superintendent, a fair amount of work was accomplished. The Raja of *Nadaun* continues to look upon vaccination with disfavor; the neighbouring Raja of *Kutlahar*, on the other hand, gave permission for the whole of his household to be vaccinated, and made very efficient arrangements by means of which a large outturn of work was effected throughout his State. I would beg to bring his services in the cause of vaccination to favorable notice, with a view to his being granted a commendatory *Murásla* from Government.

A.—VACCINE

Statement No. I showing particulars of Vaccination in the Punjab performed by the Vaccinators of the

1 Number.	2 Name of District.	3 Circles and Districts.	4 Population of District according to census of 1868.	5 Average population per square mile.	6 Average number of vaccinators employed throughout the season.	7 TOTAL NUMBER OF PERSONS VACCINATED.			8 Average number of persons vaccinated by each vaccinator.
						Male.	Female.	Total.	
1	DELHI	Tahsil Delhi ...	315,286	...	...	50	34	84	...
		Do. Ballabgarh ...	125,667	...	...	532	457	989	...
		Total of District ...	608,850	496	3	582	491	1,073	357·66
2	GURGAON.	Tahsil Rewári ...	150,631	...	...	63	50	113	...
		Total of District ...	689,034	348	2	63	50	113	56·5
3	HISSAR.	Tahsil Parwála ...	66,199	...	...	351	328	679	...
		Total of District ...	484,681	137	4	351	328	679	169·75
4	SIRSA.	Tahsil Fázilka ...	66,970	...	...	189	161	350	...
		Total of District ...	210,795	68	4	189	161	350	87·5
5	LUDHIANA.	Tahsil Ludhiána ...	290,148	...	...	270	227	497	...
		Total of District ...	573,245	429	3	270	227	497	105·66
6	SIMLA.	Sanitarium of Simla ...	17,440	...	...	617	151	768	...
		Rural Circles ...	16,154	...	...	90	78	168	...
		Total of District ...	33,594	1,888	4	707	229	936	234
7	JULLUN- DUR.	Tahsil Jullundur ...	260,885	...	...	692	639	1,331	...
		Total of District ...	794,764	596	4	692	639	1,331	332·75
8	KANGRA.	Tahsil Nurpur ...	124,780	...	...	5,111	4,448	9,559	...
		Do. Kangra including Sub-Tahsil of Palampur ...	210,223	...	...	6,342	7,132	13,474	...
		Tahsil Dera ...	126,350	...	...	4,682	4,925	9,607	...
		Do. Hamirpur ...	179,961	...	...	15,775	14,950	30,725	...
		Do. Kulu ...	98,923	...	...	2,014	1,606	3,620	...
		Total of District ...	740,237	87	34	33,924	33,061	66,985	1,970·14
9	AMRIT- SAR.	Tahsil Amritsar ...	280,289	...	...	2,969	2,484	5,453	...
		Do. Tarn Taran ...	241,150	...	...	3,181	2,658	5,839	...
		Total of District ...	730,979	535	27	6,150	5,142	11,292	418·22
10	GUR- DASPUR.	Tahsil Pathánkot ...	163,350	...	...	746	554	1,300	...
		Total of District ...	906,773	496	2	746	554	1,300	650

DEPARTMENT.

late Punjab Establishment during the six months, commencing 1st April and ending 30th Sept. 1881.

9	10	11	12	13	14	15	16	17	18	19	20	21
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
	Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
81	59	19	81	3	1	...	...	...	...	...	...	...
987	671	243	917	2	2	...	...	...	...	...	...	...
1,068	730	262	998	5	3	93.44	60	1.64	7,016.2	11.52	330.6	0.54
113	55	53	108	...	...	...	...	...	...	...	...	...
113	55	53	108	...	...	95.57	...	0.15	7,658.2	11.11	1,995.4	2.89
679	356	305	661	...	...	...	...	...	...	...	...	...
679	356	305	661	...	...	97.34	...	1.36	13,770	28.41	353	0.72
345	206	56	262	5	...	...	...	...	...	...	...	...
345	206	56	262	5	...	75.94	...	1.24	5,497.4	26.07	263.8	1.25
497	357	104	461	...	...	...	...	...	...	...	...	...
497	357	104	461	...	...	92.75	...	0.80	10,841.2	18.91	839.6	1.46
402	197	158	392	366	157	...	...	...	...	...	...	...
168	45	106	163	...	...	...	...	...	...	...	...	...
570	242	264	555	366	157	97.36	42.89	21.19	1,413.6	42.07	11	0.32
1,331	949	244	1,193	...	...	...	...	...	...	...	...	...
1,331	949	244	1,193	...	...	89.63	...	1.50	14,867	18.70	281.6	0.35
6,049	2,076	2,662	5,870	3,510	1,105	...	...	...	...	...	...	...
8,449	2,884	3,140	7,814	5,025	2,461	...	...	...	...	...	...	...
6,034	2,277	1,588	5,856	3,573	1,312	...	...	...	...	...	...	...
15,395	1,887	2,011	14,371	15,330	9,529	...	...	...	...	...	...	...
2,748	797	1,107	2,611	872	455	...	...	...	...	...	...	...
38,675	9,921	10,508	36,522	28,310	14,862	94.43	52.49	69.41	23,178.2	31.31	112	0.15
5,432	4,074	1,250	5,323	21	7	...	...	...	...	...	...	...
5,818	4,096	1,392	5,489	21	4	...	...	...	...	...	...	...
11,250	8,170	2,642	10,812	42	11	96.10	26.19	14.80	12,388.4	16.94	1,777.8	2.43
1,181	759	350	1,112	119	96	...	...	...	...	...	...	...
1,181	759	350	1,112	119	96	94.15	80.67	1.33	14,855	16.38	857	0.94

A.—VACCINE

1	2	3	4	5	6	7			8
						Male.	Female.	Total.	
Number.	Name of District.	Circles and Districts.	Population of District according to census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	TOTAL NUMBER OF PERSONS VACCINATED.			Average number of persons vaccinated by each vaccinator.
11	LAHORE.	Tahsil Kasur ...	197,667	...	...	800	660	1,460	...
		Total of District ...	789,666	218	3	800	660	1,460	486.66
12	FEROZEPORE.	Tahsil Zira ...	139,693	...	...	125	131	256	...
		Total of District ...	549,253	204	3	125	131	256	85.33
13	RAWALPINDI.	Tahsil Kahuta ...	82,348	...	...	372	271	643	...
		Do. Murree ...	32,647	...	...	250	75	325	...
		Total of District ...	711,256	114	5	622	346	968	193.6
14	GUJRAT.	Tahsil Kharian ...	190,005	...	...	183	145	328	...
		Do. Phalian ...	154,287	...	...	105	65	170	...
		Total of District ...	616,347	324	2	288	210	498	249
15	SHAHPUR.	Tahsil Shahpur ...	103,607	...	...	417	424	841	...
		Total of District ...	368,796	78	4	417	424	841	210.25
16	MOOLTAN.	Tahsil Sarai Sidhu ...	65,734	...	...	187	174	361	...
		Total of District ...	471,563	80	7	187	174	361	51.57
17	JHANG.	Tahsil Jhang ...	151,822	...	...	3	4	7	...
		Total of District ...	348,027	61	1	3	4	7	7
18	MUZAFFAR-GARH.	Tahsil Alipur ...	...	...	...	1,446	1,256	2,702	...
		Total of District ...	259,547	98	12	1,446	1,256	2,702	225.16
19	HAZARA.	Tahsil Manserah ...	109,415	...	...	796	711	1,507	...
		Do. Haripur ...	116,368	...	...	2,624	2,146	4,770	...
		Do. Abbott-abad ...	118,146	...	...	3,735	3,106	6,841	...
		Total of District ...	343,929	122	20	7,155	5,963	13,118	655.9
		TOTAL OF DISTRICTS ...	10,231,336	...	8.3	54,717	50,050	104,767	1,262.25

DEPARTMENT.—(continued).

9	10	11	12	13	14	15	16	17	18	19	20	21
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
	Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
1,460	896	413	1,309	...	...	...	...	...	...	...	...	...
1,460	896	413	1,309	...	...	89.65	...	1.65	12,518.2	15.85	1,811.8	2.29
256	191	58	250	...	...	...	...	...	...	...	...	...
256	191	58	250	...	...	97.65	...	0.45	10,755.2	19.58	760.4	1.38
643	450	171	621	...	...	...	...	...	...	...	...	...
151	97	43	140	174	...	...	...	...	...	...	...	...
794	547	214	761	174	...	95.84	...	1.06	17,808	25.03	870	1.22
328	208	99	307	...	...	...	...	...	...	...	...	...
170	123	40	163	...	...	...	...	...	...	...	...	...
498	331	139	470	...	...	94.37	...	0.76	12,869	20.87	1,059.4	1.71
841	636	113	749	...	...	...	...	...	...	...	...	...
841	636	113	749	...	...	89.06	...	2.03	8,564	23.22	646.2	1.75
361	173	150	323	...	...	...	...	...	...	...	...	...
361	173	150	323	...	...	89.47	...	0.68	8,691.8	18.43	611.4	1.29
7	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	7,224	20.75	332.8	0.95
2,604	928	1,607	2,535	98	47	...	...	...	...	...	...	...
2,604	928	1,607	2,535	98	47	97.35	47.95	9.94	4,399.4	16.95	531.4	2.43
1,496	952	458	1,410	11	1	...	...	...	...	...	...	...
4,586	2,365	805	4,189	184	113	...	...	...	...	...	...	...
6,475	3,864	2,250	6,141	366	46	...	...	...	...	...	...	...
12,557	7,181	3,513	11,740	561	160	93.49	28.52	34.60	1,669	4.85	313	0.91
75,087	32,628	20,995	70,821	29,680	15,336	94.31	51.67	8.42	195,983.8	19.15	13,858.2	1.35

A—VACCINE

Statement No. I showing particulars of Vaccination in the Punjab performed by the Vaccinators of the

1 Number.	2 Name of District.	3 Circles and Districts.	4 Population of district according to census of 1868.	5 Average population per square mile.	6 Average number of vaccinators employed throughout the season.	7 Total number of persons vaccinated.			8 Average number of persons vaccinated by each vaccinator.	9 PRIMARY Total.
						Male.	Female.	Total.		
1	Patiála Native State ...	...	...	...	4	149	157	306	76.5	304
2	Bashahar „ ...	...	...	...	7	6,014	4,439	10,453	1,493.28	7,695
3	Bhagat „ ...	...	...	...	3	453	435	888	296	432
4	Jubal „ ...	...	...	...	4	756	521	1,277	319.25	1,253
5	Kumarsain „ ...	...	...	...	3	61	47	108	36	107
6	Lambagraon „ ...	...	...	...	6	594	871	1,465	244.16	1,010
7	Kutlahar „ ...	...	...	...	3	6,664	7,113	13,777	4,592.33	12,922
8	Nadaun „ ...	...	...	...	5	2,185	2,489	4,674	934.8	3,870
9	Guler „ ...	...	...	...	2	351	347	698	349	247
10	Balsan „ ...	...	...	...	4	117	126	243	60.75	240
11	Kuthahar „ ...	...	...	...	4	197	153	350	87.5	344
12	Umb „ ...	...	...	...	3	1,014	698	1,712	570.66	1,712
	Total of Native States	...	...	...	21	18,555	17,396	35,951	1,711.95	30,136
	Grand Total	...	...	...	104	73,272	67,446	140,718	1,353.05	105,223

DEPARTMENT.—(concluded).

late Punjab Establishment during the six months, commencing 1st April and ending 30th Septr. 1881.

10	11	12	13	14	15	16	17	18	19	20	21
VACCINATION.			Re-vaccination		Percentage of successful cases.		Persons successfully vaccinated per 1,000 of population.	Average number of persons successfully vaccinated during previous five years.		Average annual No. of deaths from small-pox during previous 5 years.	
Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
Under one year.	Over one and under six years.	Total of all ages.									
65	249	304	2	...	100	...	...	659.4	...	...	...
1,893	4,567	7,279	2,758	2,071	94.59	75.08	...	1,650.6	...	...	...
87	341	432	456	189	100	41.44	...	86.6	...	...	...
110	1,011	1,225	24	4	97.76	16.66	...	168.2	...	...	...
16	76	104	1	1	97.19	100	...	377.8	...	...	...
458	228	865	455	151	85.64	33.18	...	951.2	...	...	...
490	2,076	1,241	855	505	95.50	59.06	...	142.6	...	...	...
281	898	3,609	804	482	93.25	59.95	...	842.8	...	...	...
179	65	246	451	168	99.59	37.25	...	169.8	...	...	...
5	201	237	3	...	98.75	...	...	70.2	...	...	...
45	242	334	6	...	97.09	...	...	...	...	...	...
628	928	1,612	...	...	94.15	...	...	...	...	...	...
4,257	10,882	28,588	5,815	3,571	94.86	61.41	...	5,119.2	...	...	...
36,885	31,877	99,409	35,495	18,907	94.47	53.26	...	201,103	...	...	...

B.—DISPENSARY VACCINATION.

Statement No. II showing Dispensary Vaccination in the Punjab during the six months ending 30th September 1881.

1	2	3	4	5	6	7	8	9	10	11	12	13
DISTRICTS.	Number of dispensaries in each district to which a vaccinator is attached.	Average number of vaccinators attached to dispensaries during the season.	Total number of persons vaccinated.	Average number of persons vaccinated by each vaccinator.	PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES	
					Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.
						Under one year.	One and under six.	Total of all ages.				
Lahore	1	5	222	44.40	217	145	56	201	5	2	92.62	40
Dera Ismail Khan ...	5	8	515	64.37	485	203	172	407	30	20	83.91	66.66
Hazára	2	3	670	223.33	667	543	72	615	3	3	92.20	100
Baháwalpur State* ...	4	4	1,731	432.75	1,599	852	353	1,295	132	114	80.98	86.36
Total	12	20	3,138	156.9	2,968	1,743	653	2,518	170	139	84.83	81.76
Umballa Cantonment...	1	1	614	614	603	379	183	562	11	8	93.20	72.72
Sabáthu Do. ...	1	1	210	210	170	113	44	157	40	28	92.35	70
Meean Meer Do. † ...	1	1	303	303	281	118	132	250	22	16	88.96	72.73
Total	3	3	1,127	375.67	1,054	610	359	969	73	52	91.93	71.23
GRAND TOTAL ...	15	23	4,265	185.43	4,022	2,353	1,012	3,487	243	191	86.69	78.60

* From 1st April up to 31st December 1881.
 † From 1st October do. do.

VACCINE DEPARTMENT.

Statement No. III showing particulars of vaccination performed by the vaccinators of the Special Establishment of the Eastern and Western Circles, Punjab, during the three months ending 31st December 1881.

1	2	3	4	5	6	7			8	9-12			13-14		15-16		17-18		19	20	21	
Number.	Name of district.	Circles and Districts.	Population according to census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	Total number of persons vaccinated.			Average number of persons vaccinated by each vaccinator.	PRIMARY VACCINATION.			Re-vaccination.		Percentage of successful cases.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.		
						Male.	Female.	Total.		Under 1 year.	Over one and under 6 years.	Total of all ages.	Total.	Successful.	Primary.	Re-vaccination.		No.	Ratio per 1,000.		No.	Ratio per 1,000.
	UMBALLA.	<i>Eastern Circle.</i>																				
		Tahsil Naraingarh,	142,350	...	...	3,718	3,417	7,135	...	7,050	3,478	3,479	6,789	85	9	...	...	...	...	...	...	...
		Do. Kharar ...	164,035	...	...	1,355	1,215	2,570	...	2,569	1,198	1,205	2,462	1	...	...	...	...	...	...	...	...
		Total ...	1,055,485	394	11	5,073	4,632	9,705	882-27	9,619	4,676	4,684	9,251	86	9	96-17	10-46	8-77	9,425	1,769	8-92	1-67
	RAWAL-PINDI.	<i>Western Circle.</i>																				
		Tahsil Kahuta	82,348	...	...	477	394	871	...	871	660	211	871	...	...	...	...	...	...	...	...	...
		Do. Jhelum...	150,472	...	...	2,914	2,861	5,775	...	5,775	4,185	1,590	5,775	...	...	...	...	...	...	...	...	...
		Town do. ...	11,318	...	...	61	54	115	...	115	104	11	115	...	...	...	...	...	...	...	...	...
		Total ...	244,138	...	9	3,452	3,309	6,761	751	6,761	4,949	1,812	6,761	...	...	100-0	...	27-69	...	...	...	...
		Grand Total ...	1,299,623	...	20	8,525	7,941	16,466	823-3	16,380	9,625	6,496	16,012	86	9	97-81	10-46	12-33	...	...	...	...

VACCINE

Statement No. IV showing particulars of Vaccination in the Punjab performed by the Vaccinators of the

1 Number.	2 Districts.	3 Population according to census of 1868.	4 Average population per square mile.	5 Average number of vaccinators employed throughout the season.	6 TOTAL NUMBER OF PERSONS VACCINATED.			7 Average number of persons vaccinated by each vaccinator.
					Male.	Female.	Total.	
1	Delhi	608,850	496	8	2,200	1,942	4,142	517.75
2	Gurgaon	689,034	348	6	3,928	3,006	7,534	1,255.66
3	Karnál	617,372	264	11	2,599	2,519	5,118	374.4
4	Hissar	484,681	137	5	1,122	997	2,119	423.8
5	Rohtak	551,866	295	5	1,848	1,807	3,655	731
6	Sirsa	210,795	68	4	1,545	1,669	3,214	803.5
7	Umballa	1,055,485	394	10	4,158	4,062	8,220	822
8	Ludhiána	573,245	429	8	1,334	1,140	2,474	309.25
9	Simla	33,594	1,888	1	54	45	99	99
10	Jullundur	794,764	596	9	7,066	6,241	13,307	1,478.55
11	Hoshiárpur	938,890	450	12	2,798	2,574	5,372	447.66
12	Kángra ... ..	...	...	...	...	...	...	...
13	Amritsar	730,979	535	13	3,773	3,263	7,036	541.23
14	Gurdáspur	906,773	496	10	3,245	2,867	6,112	611.2
15	Siálkot	1,005,004	510	12	4,545	3,902	8,447	703.91
16	Lahore	775,551	218	9	4,501	3,696	8,197	910.78
17	Gujránwála	550,576	207	4	3,386	3,027	6,413	1,603.25
18	Ferozepore	533,416	204	7	3,779	3,569	7,348	1,049.71
19	Rawalpindi	699,647	114	12	4,966	3,825	8,791	732.58
20	Jhelum	500,988	128	6	3,054	2,907	5,961	923.5
21	Gujrat	616,347	324	8	5,332	4,499	9,831	1,228.87
22	Shahpur	368,796	78	9	3,125	3,064	6,189	687.66
23	Mooltan	459,765	80	6	2,117	1,886	4,003	667.16
24	Jhang	348,027	61	10	2,068	1,981	4,049	404.9
25	Montgomery	359,437	64	6	2,127	1,669	3,796	632.66
26	Muzaffargarh	295,547	98	5	484	442	926	185.2
27	Dera Ismail Khan	394,864	56	7	362	295	657	93.86
28	Dera Gházi Khan	309,978	118	6	2,800	2,259	5,059	843.16
29	Bannu	287,547	91	3	801	781	* 1,582	527.33
30	Pesháwar	500,443	271	6	1,287	638	2,168	361.33
31	Hazára	367,218	122	3	759	633	1,392	464.
32	Kohát	145,419	52	2	850	964	1,914	957.
Total for the Province ...		17,487,125	173	223	82,113	72,769	155,125	696.07

NOTE.—During these three months no vaccinations were performed in the Kángra District.

* The total of males and females does not agree with the total given for the District.

DEPARTMENT.

District Establishment during the 3 months commencing from 1st October & ending 31st Dec. 1881.

8	9	10	11	12	13	14	15	16	17	18	19	20
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Successful.			To tal.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
	Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
4,111	2,406	1,557	3,963	31	17	96.39	54.83	6.53	716.2	11.52	330.6	0.54
7,521	4,830	2,480	7,310	13	5	97.19	38.46	10.61	7,658.2	11.11	1,995.4	2.89
5,117	3,163	1,369	4,532	1	1	88.59	...	6.04	6,111.6	9.89	1,679.6	2.72
2,119	1,534	464	1,998	...	...	94.28	...	4.12	13,770	28.41	353	0.72
3,648	2,095	1,448	3,543	7	3	97.12	42.85	6.42	9,153	16.58	395.6	0.71
3,209	2,537	507	3,044	5	3	94.85	60	14.45	5,497	26.07	263.8	1.25
8,084	4,766	2,852	7,618	136	76	94.23	55.88	7.28	9,425	8.92	1,769	1.67
2,471	2,006	378	2,384	3	1	96.47	33.33	4.16	10,841.2	18.91	839.6	1.46
91	26	53	79	8	2	86.81	25.00	2.41	1,413	42.07	11	0.32
13,307	9,443	3,214	12,657	...	...	95.11	...	15.92	14,867	18.70	281.6	0.35
5,372	4,047	1,034	5,081	...	...	94.58	...	5.41	20,773.8	22.12	563.8	0.60
...
7,036	6,372	324	6,696	...	...	95.16	...	9.16	12,388.4	16.94	1,777.8	2.43
6,112	4,781	862	5,643	...	...	92.32	...	6.22	14,853	16.38	857	0.94
8,446	7,238	965	8,203	1	1	97.12	100	8.16	24,605.2	24.48	798.2	0.79
8,185	3,756	4,119	7,875	12	3	99.91	30.0	10.16	14,408	18.58	1,811.8	2.34
6,386	5,454	739	6,193	27	11	99.41	38.89	11.25	13,471	24.47	779	1.40
7,348	4,192	3,038	7,230	...	...	99.44	...	13.55	1,655	3.10	760.4	1.42
8,671	6,378	1,983	8,361	120	20	98.50	29.85	11.95	20,221	28.90	870	1.24
5,938	4,508	969	5,477	23	...	92.50	93.33	10.93	11,775	23.50	559.4	1.12
9,748	7,693	1,278	8,971	83	64	97.68	82.05	14.55	11,851	19.23	1,059.4	1.72
6,189	5,493	536	6,029	...	...	98.69	...	16.35	10,705	29.03	646.2	1.75
3,970	1,870	1,758	3,628	33	10	99.51	33.33	7.89	21,729	47.26	611.4	1.33
3,904	3,348	459	3,807	145	72	99.22	49.65	10.94	...	...	332.8	0.96
3,796	3,277	390	3,667	...	...	99.11	...	10.20	...	...	983.6	2.74
910	715	137	852	16	11	98.72	78.57	2.88	...	...	631.4	2.14
657	320	229	549	...	...	89.26	...	1.39	...	...	933.6	2.36
5,056	2,171	2,406	4,577	3	2	98.38	100	14.77	...	...	341.6	1.10
1,565	949	558	1,507	17	10	98.11	71.43	5.25	...	...	881.2	2.96
2,149	779	1,146	1,925	19	18	91.07	94.74	3.82	...	...	616.8	1.23
1,391	931	332	1,263	1	...	96.26	...	3.44	2,721	7.41	313	0.85
1,914	1,051	790	1,841	...	...	98.82	...	12.66	...	...	161.4	1.11
154,421	108,129	38,374	146,503	704	330	94.87	46.87	8.91	...	...	24,291	1.39

91. Dr. Massy was in charge of this portion of the establishment during the six months under review, operations were carried on in the district of Hazára and in the hilly parts of Rawalpindi, by a staff of 6 Native Superintendents and 25 vaccinators. A brief summary of the work is here given.

Hazára district.—Operations were conducted here from the beginning of April to the end of July, the total number of persons vaccinated being 13,118; of these 11,740 primary cases were successful, the ratio of success being 93·49 including unknown, and excluding these 98·08 per cent. and the ratio successfully vaccinated per 1,000 of population 34·60.

Rawalpindi district.—In the Murree Hills Vaccination on a limited scale was kept up from the commencement of the rains until the end of the hot season, the total number of operations in the district was 968, with a percentage of 95·84, including unknown, and excluding these 99·21.

92. The work performed by the Dispensary Vaccinators was as follows: *Lahore city.*—The city establishment consisting of 3 permanent and 2 temporary vaccinators continued work, on a limited scale, during the month of April, performing altogether 222 operations, with a percentage of 92·62 successful including, and 98·04 excluding unknown.

Dera Ismail Khan.—In 5 dispensaries 8 vaccinators were employed throughout the district during the early part of April, and vaccinated 515 persons; the ratio of success in primary cases including unknown, was 83·91, and excluding these 86·59.

Hazára district.—Three vaccinators attached to two dispensaries were employed here throughout the hot season; total number vaccinated 670, with, in primary cases, 92·20 per cent. successfully vaccinated, and excluding unknown 96·85.

Bahawalpur State.—Four vaccinators paid from State funds worked in April and performed 838 vaccinations; the percentage of success in primary cases was 78·36, and excluding unknown 79·71, while in re-vaccination cases, excluding unknown from the calculation, the ratio of success is returned as having been 85·1: the returns are no doubt incorrect.

THE SPECIAL VACCINATION ESTABLISHMENT OF DEPUTY SANITARY COMMISSIONERS.

93. *Eastern Circle.*—The Vaccinators were employed during the 3 months ending 31st December in the tahsils of Naraingarh and Kharar in the Umballa district, under the superintendence of Pandit Balkishen, the Deputy Superintendent of Vaccination. Operations were commenced in the former tahsil on the 22nd October, and brought to a close on the 25th December; during this period the work was much delayed by excessive sickness from malarious fevers then prevalent along the sub-montane tract of the Umballa district. Not only were the numbers of infants and children fit to undergo the operation greatly diminished by the prevailing sickness, but at one time almost the whole of the vaccinators were prostrated by the disease, from which two of their numbers died. The out-turn of work accomplished by this portion of the establishment is therefore very small, the total number vaccinated amounting to only 9,705; of these, in primary cases, the percentage of success, including unknown in the calculation, is 96·17, and excluding these 99·01. The tahsil of Kharar had only just been entered on before the year under report came to a close.

94. *Western Circle.*—The total number vaccinated amounted to only 6,761 all primary vaccinations, and all of which are reported to have been successful. The Deputy Sanitary Commissioner Surgeon J. O'Neill furnishes the following explanation for the small amount of work accomplished in this circle from October to December 1881.

"The vaccinators of my special staff compared with other vaccinators have a great deal of travelling as they are likely to be moved to any place where small-pox appears. For instance, this winter they were all hurried up to Abbottabad from Pind Dadan Khan in the Jhelum district on account of an unfounded rumour that small-pox had broken out in the former town. They were again called down to Jhelum, and subsequently three of them proceeded to Attock."

95. Statement No. IV shows the vaccinations performed, by the district vaccinators under the re-organized scheme from October to December 1881. The number of persons vaccinated was 155,125 of which number 154,421 were primary vaccinations and 704 re-vaccinations; of the primary operations 146,503 were returned as successful, the percentage of success being, 94·87.

96. The aggregate number of operations performed by all establishments during the 9 months ending 31st December 1881 was 316,574 as compared with 483,763 in the preceding year, which embraces a period of 12 months, that is from 1st April 1880 to 31st March 1881, being a decrease of only 167,089. The total number of primary vaccinations were 280,046 of which number 265,411 were successful.

As the re-organized vaccine scheme has been scarcely three months in operation no useful comparison can therefore be instituted between the results obtained in the present and past years, and all that needed be added here is that every endeavour is now being made to make vaccination more popular amongst the people of this Province. The Civil Surgeons have been directed to work on a more uniform system, and they have been particularly requested to see that the vaccinators are properly qualified and that the directions in the method of performing the operation as practised by the Vaccinators of the late Provincial Establishment for the last 16 or 17 years are carefully attended to.

97. In all operations six punctures should always be made on each person vaccinated and they should be half an inch apart so as to allow space for the full development of each vesicle. All the punctures may be made in the same arm, but in infants it is better to make three upon each.

Method of operation.
 98. The method of "arm to arm" vaccination is to be invariably followed except on the rare occasions where it may be found to be impracticable. In some places "the arm to arm" method is unfortunately very unpopular. This is partly the result of high caste people very naturally objecting to have their children vaccinated from the arm of an infant of some menial caste, and partly of the altogether reprehensible custom followed by some vaccinators of carrying about the vacciferous infant from house to house or village to village. Both these causes of objection are easily remediable with a little consideration and pre-arrangement on the part of the vaccinators, and it will be the duty of the Civil Surgeons to see that their vaccinators carry out the system without giving unnecessary trouble to the vaccinifers and without offending the natural prejudices of the parents. There should be no difficulty in vaccinating the children of high caste Hindus from members of their own caste or some other nearly allied, without subjecting the high caste parents to the disgust of having their children vaccinated from the arm of some low caste and not very presentable infant. As regards the carrying about of vaccinifers from house to house and village to village, this very objectionable custom should be peremptorily stopped. There should be no difficulty in arranging for the children to be vaccinated being collected together at an appointed place in each village or ward of a town from time to time, and then and there vaccinated from the arm of the vaccifer brought to meet them for the purpose. The vaccifer in most instances may be a child of the same village or ward, or at the first starting of operations the vaccifer may be brought from an adjoining village or ward.

In carrying out these details much care and attention will be required on the part of the vaccinators, and the success of their operations will be the test of their diligence and devotion. After vaccinating his first batch of children the vaccinator should prepare a list of children to be vaccinated from the selected vaccinifers among them on the following week day, and arrange with their parents to assemble with their children registered for vaccination at an appointed place and date there, to meet the vaccinifers whom he will also cause to be present at the same place and hour. He can then vaccinate his 20 or 30 children at once and so on arrange for successive batches, on successive week days. The aid of the Municipal Committees and village headmen should be sought in the carrying out of this system, and it will be the duty of the Civil Surgeon to explain to these representatives of the people the object, and advantages of vaccination and to invite their co-operation.

Statement No. V showing the Vaccinations performed since 1867 to year under review.

99. Statement No. V shows the number of persons primarily vaccinated and the number of those successfully vaccinated in the Punjab Province from 1867 to the year under review.

100. In former returns Statement No. II which used to come after Statement No. I showing the operations performed by the Provincial Establishment and in which the cost of the vaccine department is shown cannot be furnished this year, as the necessary details for completing it—details of the expenditure from Municipal and District funds respectively—have not yet been received.

SECTION IX—SANITARY WORKS—CIVIL

PLUMBING WORK

SECTION VIII.

No Remarks.

SECTION IX.—SANITARY WORKS—CIVIL.

101. The following information has been received from the Secretary to Government, Punjab, Public Works Department, regarding Water-supply and Drainage schemes in progress or under consideration in the Punjab Province during the year 1881.

DELHI WATER WORKS.

The evacuation of Chundrawal (which has been approved of by Sanitary Commissioner as the best site for the supply wells), by the villagers occupying it, is now being carried out with the sanction of Government.

Funds for this work will either be advanced by Government as a loan in the usual manner, or raised locally by the Municipality; and this question is now under consideration. The plans and estimates for the water-supply and drainage works prepared by Mr. Morley, Assistant Engineer, have been received from the Commissioner, Delhi Division, and are now under scrutiny.

LUDHIANA DRAINAGE AND WATER-SUPPLY SCHEMES.

No further information on the above subject has been received in this office during the year.

LAHORE WATER WORKS.

(Report furnished by MR. L. CLARKE, Municipal Engineer, Lahore.)

The Lahore Water-supply is now completed and in full operation.

The works were opened on 30th June 1881, and the pumping has been constant since that date with the exception of a few days in September, when pumping had to be stopped in order to reduce the height of the High Pressure service.

Owing to the failure of the Service Reservoir, the water has to be pumped directly into the Mains, this makes a constant pressure through the whole of the piping during the time of pumping, the surplus water being discharged into the circular sewer, but there is a constant supply in the pipes at a reduced head at all times throughout the day and night, with the exception of certain high places in the city.

When the new Reservoir has been re-constructed, a constant pressure will be maintained in the pipes at a very much reduced cost, as there will be no water running to waste, and pumping will only be required to keep the water at a working level.

At present the hours of pumping are from 7 A. M. to 10 A. M., and from 5 P. M. to 7 P. M.; these hours have been found sufficient, and have been fixed to suit the convenience of the people.

The cost of the water without interest on the loan is at present about one anna and ten pies per 1,000 gallons (this includes fuel and establishment), but the cost ought to be reduced to about one-half this amount when the Reservoir has been re-constructed.

The length of piping which has been laid throughout the city and suburbs is about 22 miles in length. Pipes have been laid in all the principal streets, and the stand-posts, 167 in number, for drawing water, have been placed at the most convenient sites to suit the inhabitants; there are about 130 in hand which can be put up whenever it may be desired necessary from time to time; 118 fire Hydrants have been put on the Mains, which can be used in case of fire, for washing roads, and for sanitary purposes; the number can be augmented from stock in hand.

The people are not so ready to lay on the water to their houses as I had hoped; only about 110 connections have as yet been made. There is a very discontented feeling amongst the people, they consider the charge made by the Municipality for the water is too high. I have no doubt that if the water-rates be reduced, almost all householders within reasonable distance of the service pipes would lay on the water to their houses, and I am of opinion that it would be better for the Municipality to reduce the rates, at least for a time. At present the bhists can take water from the stand-posts and distribute it to householders at a less cost than they would pay if they had it laid on their houses; there will not be a general demand for water at the present rates; another evil of excessive rates is that the bhists take possession of the stand-posts to the exclusion of other people.

There is no doubt the use of the water has become general, and the old prejudices are being lost sight of; the demand is gradually increasing; it is the duty and to the interest of the Municipality to encourage the demand as much as possible.

It is time to consider whether it will not be better in the interests of the people to have some of the most contaminated of the public wells shut up, and gradually go on doing so until they have all been closed.

The works have been in constant operation for seven months. It has been thoroughly tested ; there is an ample and unfailing supply of pure water, and there can be no fear of a stoppage of the works in any way ; the only accident that could happen would be a leaky joint or a broken pipe, which can be put right within an hour, and this would only stop supply in the particular pipe, and not in any other place ; of course such accidents do and will happen in every water-works, and it is consequently the duty of the Municipality to have a good and sufficient staff to keep every thing right.

A good deal has been said about the failure of the Reservoir, no doubt the accident was an unfortunate occurrence, but it has nothing whatever to do with the scheme, which, as a water-supply scheme, I consider is a complete success. Water of undoubted pure quality has been laid on to the city and suburbs, and in unlimited quantity. The Reservoir will be re-built in a short time, when there will be a constant service. The extension of piping to wherever the water may be required is merely a matter of time and money ; the supply of water is ample for every want, and the main pipes are also sufficient for all future requirements.

SIMLA WATER WORKS.

No active work was in progress during 1881, but orders have recently been issued to start work on the Sangauli Reservoir.

KOHAT WATER-SUPPLY SCHEME.

No action taken this year.

102. The Income and Expenditure of the Municipal funds in each district of the Province during 1881, is shown in the statement overleaf. The income, inclusive of last year's balance, it will be seen, was Rs. 3,570,832, and the Expenditure Rs. 2,509,391.*

The amount expended on sanitary works, including conservancy establishment, was as follows :—

1. Conservancy establishment	...	...	...	Rs.	389,118
2. Paving	...	...	...	"	54,448
3. Roads and bridges	...	...	...	"	223,801
4. Drainage and sewerage	...	...	...	"	88,865
5. Water-supply, including cleaning and repairing of tanks, wells, &c.	...	...	...	"	85,629
6. Widening streets	...	...	...	"	43,617
7. Construction of latrines	...	...	...	"	14,160
8. Repairs of do.	...	...	...	"	9,999
			Total Rs.	...	909,637

* Excluding the figures of the district of Bannu from which no return has been received up to date (16th May 1882) notwithstanding several reminders were sent to the Deputy Commissioner.

TABLE showing the Income and Expenditure of Municipalities

Number.	Names of Districts.	Number of Municipal towns in each District.	ASSETS.			DISBURSE						
			Balance from previous year.	Actual income for the year.	Total.	Conservancy Establishment.	Paving.	Roads and bridges.	Drainage or sewerage.	Water-supply including clearing and repair of wells, tanks, &c.	Widening of streets.	Construction of latrines.
1	Delhi	5	71,444	287,821	359,265	54,198	20	26,306	6,544	11,425	...	4,116
2	Gurgaon	7	39,582	66,585	106,167	8,455	1,481	10,075	30	1,156	110	1,262
3	Karnal	5	18,362	59,410	77,772	7,221	1,742	16,438	364	866	...	2,251
4	Hissar	6	55,302	52,111	107,413	11,216	500	11,795	856	135	792	466
5	Rohtak	6	14,425	32,922	47,347	4,538	150	3,444	15	537	...	137
6	Sirsa	5	36,520	26,571	63,091	2,912	48	1,632	1	1,753	...	660
7	Umballa	11	36,769	75,370	112,139	11,871	4,013	5,875	848	928	...	698
8	Ludhiána	6	60,999	79,024	140,023	18,300	...	7,299	2,075	533	200	...
9	Simla	1	12,819	166,207	179,026	19,951	...	17,600	1,339	...	*23487	402
10	Jullundur	11	20,754	66,369	87,123	11,757	5,938	2,684	2,013	642	...	626
11	Hoshiárpur	9	23,048	48,099	76,147	8,478	4,215	1,034	2,909	313	...	...
12	Kángra	6	6,681	19,977	26,658	1,572	480	2,145	...	634	...	...
13	Amritsar	6	152,939	305,962	458,901	42,813	600	26,118	39,991	4,784	5,966	...
14	Gurdáspur	16	23,073	57,820	80,893	6,519	4,046	2,270	896	3,539	...	177
15	Siálkot	9	14,531	50,201	64,732	7,092	3,078	4,559	200	515	...	...
16	Lahore	7	49,244	241,047	290,291	37,962	231	27,391	3,861	...	...	...
17	Gujránwála	10	28,871	61,343	90,214	8,343	10,402	2,700	1,192	3,297	...	...
18	Ferozepore	5	28,010	39,491	67,501	4,786	102	6,145	680	3,067	...	264
19	Rawalpindi	6	47,794	123,018	170,812	23,568	811	4,699	267	2,152	...	28
20	Jhelum	4	66,714	60,855	127,569	9,989	2,007	5,627	1,263	3,385	35	54
21	Gujrat	4	10,532	24,139	34,671	3,815	1,701	627	255	730	...	...
22	Shahpur	6	39,494	36,652	76,146	4,896	1,667	7,012	107	6,167	...	...
23	Mooltan	6	54,220	102,911	157,131	15,072	1,178	14,847	1,079	769	...	1,155
24	Jhang	5	19,744	35,097	54,841	5,303	2,387	258	563	1,196	...	1,109
25	Montgomery	5	5,665	17,503	23,168	1,961	53	15	55	38	...	...
26	Muzaffargarh	8	7,928	23,740	31,668	3,949	1,576	771	496	1,462	...	...
27	Dera Ismail Khan	5	20,902	55,700	76,602	9,516	3,000	2,174	...	56	2,000	...
28	Dera Gházi Khan	5	18,646	43,615	62,261	8,409	3,022	1,526	2,864	553	73	...
29	Bannu	4	...	...	...	...	...	...	...	...	...	...
30	Pesháwar	2	3,689	235,483	239,172	27,064	...	9,105	15,767	34,189	10,541	...
31	Hazára	4	10,089	19,129	29,218	2,318	...	1,326	328	343	...	...
32	Kohát	1	28,526	23,944	52,870	5,274	...	304	2,007	465	413	756
	Total	196	1,032,716	2,538,116	3,570,832	369,118	54,448	223,801	88,865	85,629	43,617	14,100

in each District of the Punjab Province during the year 1881.

MENTS.									REMARKS.
Repairs of latrines.	Total sanitary charges.	Vaccination.	Dispensaries.	Police.	Schools.	Miscellaneous.	Total expended.	Balance unexpended.	
38	102,647	582	9,125	65,946	6,706	92,569	277,575	81,690	
40	22,609	...	6,448	13,208	4,899	11,951	59,115	47,052	
43	28,925	...	3,365	15,579	3,687	13,345	64,901	12,871	
290	26,050	62	4,168	15,123	3,053	12,624	61,080	46,333	
285	9,106	...	1,502	8,318	3,970	9,100	31,996	15,351	
50	7,056	98	3,626	5,399	4,074	12,384	32,637	30,454	
745	24,978	582	4,021	13,889	3,215	17,959	64,644	47,495	
1,058	29,465	213	5,063	12,367	16,657	17,417	81,182	58,841	
834	63,613	...	2,152	7,972	946	95,990	170,673	8,353	* Other Public Works charges.
399	24,059	98	5,708	15,889	8,850	13,229	67,833	19,290	
1,466	18,415	...	3,707	10,234	2,813	16,155	51,324	24,823	
...	4,831	...	3,988	2,493	1,545	3,867	16,724	9,934	
1,050	121,322	608	28,388	54,733	9,281	84,186	298,518	160,383	
...	17,447	...	4,419	11,066	6,934	12,061	51,927	28,966	
100	15,544	...	2,959	10,081	5,017	10,958	44,559	20,173	
699	70,144	538	12,649	43,406	7,740	118,974	2,53,451	36,840	
205	26,139	64	8,783	10,064	5,540	15,961	66,551	23,663	
100	15,144	98	4,681	7,353	3,097	11,788	42,161	25,340	
1,372	32,897	60	10,792	14,187	4,488	19,640	82,064	88,748	
426	22,786	64	7,184	10,706	3,222	19,097	63,059	64,510	
195	7,323	10	1,659	6,115	754	5,175	21,036	13,635	
110	19,959	...	3,934	10,041	3,098	10,331	47,363	28,783	
...	34,100	77	8,238	19,444	5,781	32,767	100,407	56,724	
160	10,976	158	3,546	5,938	3,999	7,963	32,580	22,261	
...	2,122	...	4,477	1,676	3,645	2,450	14,370	8,798	
10	8,264	10	2,761	3,848	2,729	6,526	24,138	7,530	
37	16,783	236	5,753	7,452	4,196	34,702	69,122	7,480	
94	16,541	...	3,562	6,689	4,154	15,371	46,317	15,944	
...	.....	...	...	...	...	...	...	...	No return received from the Deputy Commissioner.
149	96,815	300	11,354	46,283	1,947	65,552	222,251	16,921	
44	4,359	33	545	3,796	481	7,321	16,535	12,683	
...	9,218	103	1,141	7,561	4,555	10,720	33,298	19,572	
9,999	909,637	3,994	179,698	466,856	141,073	808,133	2,509,391	1,061,441	

Sanitary improvements effected during the year in the several districts of the Province.

103. The following is a brief history of the sanitary progress made during 1881 in the municipal towns of the Province, epitomized from the reports received from the Deputy Commissioners.

DELHI.

There were no new drains constructed during the year, as the Committee are of opinion that it would be a waste of money to construct new ones at present, as these would not probably fit in with the regular drainage scheme, which has lately been prepared by the Municipal Engineer, Mr. G. S. Morley, and submitted to Government for sanction.

The old *Sháhjaháni* drains in the principal streets, as also those in the *gullies* and *kuchás*, were opened up and thoroughly cleaned out. The work took some considerable time before it was properly finished. The drains on either side, as well as those in the centre of the *Chandni Chauk*, were also cleaned, and afterwards flushed with steam power for ten consecutive days, so that at present they are in good working order and perfectly free from offensive smells.

During the year under report the Committee have again done a great deal in endeavouring to improve the conservancy of the city and suburbs. The re-organization of the Conservancy Department in 1879 has proved very successful, the establishment in the various branches of this department have worked well, and the result is that the city is pronounced by all to be very clean and healthy, and such is also the opinion expressed by Surgeon-Major, J. C. Ross, Civil Surgeon of Delhi.

The Committee have adopted the system of stacking the night soil in extra-mural depôts in place of the system hitherto in force of trenching round the circular road. The system is similar to that at Amritsar. A pit is dug 6 feet deep, throwing the *debris* to a height of 6 feet all round, thus a total depth of 12 feet is obtained. The filth is thrown in and properly levelled by *beldars*; it is then sprinkled with lime and covered with earth. Up to the end of the year five out of eight pits were completely filled with night soil. In connection with the working of the above system extra-mural depôts were constructed and started behind the wall adjoining the *Burjes*, situated between the city gates at a distance of about 400 yards. A door of communication for carts is made in the city wall at each depôt through which the refuse is carted from the wards to the depôt, and here deposited. Between 9 and 10 o'clock the filth is accumulated, and the extra service carts convey it from the intra to the extra-mural depôts where it is properly stacked as before described.

The extra service carts alluded to are quite distinct from those that work in the city wards. This arrangement has been in progress since September last, and there is every reason to hope that this new system of conservancy will in a short time show a further improvement in the general cleanliness of the city.

At present the only drawback felt is, that the Municipality is not yet in a position to secure the whole of the night soil of the city and suburbs, owing to insufficiency of carts, hence the *mohalla* sweepers still continue to retain the largest portion which they dispose of to infinite advantage, and in consequence the Committee find it impossible to dispose of the manure, which they have stored away in pits. To overcome this difficulty fifty additional carts have been sanctioned and are under construction, when ready a move will at once be made to secure the monopoly of the whole of the night soil in the city and suburbs; in this way only do the Committee hope to derive an income from the sale of manure.

The conservancy carts purchased from Messrs. Crawley & Co.'s firm at Allahabad, have proved a good investment; they have been in constant use for over a year and are still working well. There are 180 carts in regular use, whereas formerly there were only 100 carts in all, so that when the fifty, and those that are now being made, are added to the present number the Committee will have 230 carts for conservancy purposes.

The Committee have again this year expended a large sum of money towards the construction of *packa latrines*.

The following were built this year:—

30	Chamber	latrines	near	Cabul gate.
33	Do.	do.	in	Dhobiwára.
10	Do.	do.	near	Turkomán gate.
30	Do.	do.	in	Katra Dhakin Rai.
30	Do.	do.	"	" Foulád Khan.
30	Do.	do.	"	" on right of Eídgh, near Sadr Bázár.

In addition to the cost of these latrines the Committee were obliged to purchase the sites of most of them as the spots where they were mostly needed belonged to private parties to whom compensation

had to be paid. It was intended to construct a similar latrine, but on a much larger scale, outside the Lahori gate and *Kirki Farash Khana*, but on account of the ground being required for the Okla Navigation channel, the proposal was abandoned, and a latrine on a smaller scale built near the *Eidgah* for the use of *Chamars* and other low caste inhabitants in that locality. There were two new kacha, and eight new *jafri* latrines erected in the suburbs, and 16 new urinals built in the city in places where they were deemed necessary.

There were 43 public latrines in working order at the close of the year, *viz.* :—

10	...	...	...	in the City.
12	...	...	...	" Paharganj
11	...	...	...	" Sadr Bazar.
7	...	...	...	" Sabzi Mandi
3	...	...	...	" Civil lines.

The following sanitary works were undertaken during the year, *viz.* :—

Construction of side drains and metalling Faiz bazar road.

Sonipat.—Metalling between *Helwai Hatta* and Thana Darwaza and on to tahsil building and metalling between Darwaza Jhangiran and Mandi bazar.

Najafgarh.—Metalling and constructing side drains in the principal bazars of the town. All the wells used for drinking purposes within municipal limits were cleaned after the rains, but no new works under this head were undertaken in the minor municipal towns. A number of new wells were sunk, and others repaired on public thoroughfares from District funds, and two large tanks were deepened and improved near Pali and Basai. The Municipal Committee of Sonipat have sanctioned the construction of a wall round the town which is now in course of construction, and have planted both sides of the circular road with ornamental trees. Some pits and depressions were filled up in the towns of Sonipat and Ballabgarh. The Municipal Committees in recent years have paid greater attention to conservancy arrangements. Four conservancy carts were made for the town of Sonipat in 1880, and 4 for Ballabgarh in 1881, and 4 have been recently ordered for Faridabad. The income of the minor municipalities is, however, small, and after deducting the necessary charges on account of collection of Octroi and the Police, &c., the surplus does not admit of any large expenditure on sanitary improvements. The conservancy establishments are fairly efficient. The number of latrines in working order in each town is 8 in Sonipat, 6 in Ballabgarh, 7 in Faridabad and 4 in Najafgarh. The town sweepings are removed to godowns outside and sold to the highest bidder, but as yet little income is derived from this source.

GURGAON.

Rewari.—Pavement of the Najmandi bazar completed. The second half of the circular road re-metalled. The first half was completed last year. Rewari-Jhajjar road metalled from the Gokal gate to the Railway, about a mile; Kotla bazar road metalled. Rewari-Namol road raised with earth from Kutabpur gate to Railway Station. Verandah and large rooms of the dispensary floored with slates; the pavement of the grain market commenced last year is completed. Roads from Kanond and Gokal gates to Railway Station metalled, and drainage improved. All the old wells used for drinking purposes have been cleaned out.

Palwal.—Nimtola mohalla street paved. Paving a part of the street inside the town at the Kanoyo gate, and kankar metalling and raising road from gate to circular road, and metalling the road from the Delhi-Muttra road through grain market and up to pukka flooring, are in progress. A large tank near the town has been thoroughly cleaned out.

Ferozpur.—A new pukka female latrine has been erected, and all the drains cleaned. A new female ward and other additions to the dispensary reported in progress last year are nearly completed.

Sohna.—A new pukka female latrine constructed. The bathing tanks at the hot springs have been cleaned twice a month. The main bazars have been paved, and all the drains cleaned.

Hodal.—A scheme for metalling the principal bazars was sanctioned 18 months ago, and the District Engineer was instructed to get the work done, but, for some reason or other, it has been kept in abeyance till now.

KARNAL.

In the town of Karnál the Jundla street, the Ghazní bázár, the Diálpúra street and a series of streets from the Jundla gate to the Kalandar, were paved with brick on edge and provided with saucer drains of masonry at a cost of Rs. 9,742, of which Rs. 6,671 were paid away within the year. Four male and three female latrines have been completed at a cost of Rs. 2,821, of which Rs. 1,354 were expended within the year. They are built on a uniform plan, with domed roofs, stone slabs for pavement, and with drains cut in stone. Iron vessels painted with tar from time to time are used. An addition was made to the slaughter-house at a cost of Rs. 119, but it is still too small and will be enlarged when funds can be provided. A manure depôt was surrounded by an enclosure at a cost of Rs. 38.

Pánípat.—In Pánípat the following streets have been paved with kankar or brick, chiefly with the latter, and have been provided with masonry saucer drains, *viz.*, the Salárganj street, the Ausarian street from Kalandar Chauk to Charao gate, Shah Wiláyat street, Ausarian gate street, the Madhoganj street, Mubarik Khan street, the Chul Khan street and the grain market street, at a cost of Rs. 17,961, of which Rs. 7,174 have been paid away within the year. The work of re-metalling and providing proper drains in Pánípat, so far as the interior of the city is concerned, has almost approached completion, and will be finished probably in the coming financial year. Two male and two female latrines have been provided on the same plan as at Karnál at a cost of Rs. 1,601 of which Rs. 1,016 were paid away within the year. These are all the latrines that have been built in Pánípat on the new plan. Four manure enclosures were formed at a cost of Rs. 80.

Kaithal.—In Kaithal, side drains were constructed for the Pundri gate street at a cost of Rs. 868. The slaughter-house was removed from a site which was found objectionable on religious grounds to another site, the old materials being made use of at a cost of Rs. 25.

Pundrí.—In Pundri an estimate was prepared for providing side drains for one of the streets at a cost of Rs. 1,600, but nothing was expended within the year. The work is at present in progress.

Kunjpúra.—A similar work is in progress at Kunjpúra. It is estimated to cost Rs. 3,060; only Rs. 300 were expended within the year, and it will take the savings of several years to complete it. It is at the present date half finished. The sum of Rs. 548 has been expended on cleaning wells in Pánípat, Pundri and Kaithal towns.

HISSAR.

All the drains were thoroughly cleaned out and properly repaired; they are in good order and the water runs out easily, and no rubbish or filth is permitted to accumulate therein.

The following sums were expended on this work during the year under report:—

Hissar, Rs. 162; Hausi, Rs. 123; Bhiwani, Rs. 291; and Fatehabad Rs. 50.

A new drainage work has been constructed in Bhiwani Municipality, at an outlay of Rs. 230, for carrying off the rain water of the Rámganj bázár, and this work has been found to be of great benefit for sanitary purposes. Another scheme for improving the drainage at Bhiwani is under consideration, on which Rs. 977 are proposed to be spent, and this important work when completed will be a great sanitary improvement. It is, however, too late during the current financial year to take it in hand.

An aggregate sum of Rs. 135 has been spent for cleaning and repairing wells, and all wells are reported to be in good order.

In addition to the above sum, Rs. 200 have been contributed from District funds for improving village tanks and wells during the year under report, and several other proposals were under consideration at the close of the year. All the wells situated in the encamping grounds have been cleaned out at a cost of Rs. 150 from Provincial funds.

Two conservancy carts, completely made of iron, have been obtained for Bhiwani Municipality, at a cost of Rs. 477, from Messrs. Crawley & Co. A new conservancy cart has been provided for the Hansi Municipality at an outlay of Rs. 35.

At the cattle fair site, trees have been planted, and pukka approaches constructed. The tank at that locality has been cleaned, and a water-cut from the canal is being made to feed this tank.

The following detail shows the number of latrines in each Municipality, all of which are in good working order:—

Hissar	...	...	...	4
Hansi	...	...	...	4
Katia	...	...	...	3
Bhiwani	...	...	...	27
Fatehabad	...	...	...	2

These are always kept clean, and during the year under report an aggregate sum of Rs. 290 was spent on repairs.

At Hissar, in the compound of the District office, a latrine has been constructed at a cost of Rs. 176 for the convenience of the people attending court.

At Fatehabad two new latrines have been completed at a cost of Rs. 290.

The refuse, as usual, is taken from the latrines and conveyed by means of conservancy carts or in baskets to filth trenches, which are sufficiently deep and wide as required by the sanitary rules, and are situated at a good distance from the town; and when it is properly deodorized there, it is sold to agriculturists. The amount realized on this account during the year amounted to about Rs. 292.

ROHTAK.

The Municipal Committee of Rohtak has sanctioned the sum of Rs. 329 for the construction of a drain on either side of the road leading from the Delhi gate to the newly built gate, (over which will be erected the Municipal Hall and Octroi offices, now in course of construction). Properly speaking, this work should not be included in this year's report; although the Committee sanctioned the work last year, the initial expenditure has only just commenced.

The circular road round Rohtak was very much cut up in the rains by the rush of water from the town, but the road-way has now been supplied with side channels, and the water-escape cuts have been cleaned out so as to permit an easy flow.

A pukka well has been constructed in the compound of the Jhajjar school at a cost of Rs. 300, and the upper surface was lately made pukka. A well in the Gohána dispensary, in part paid for by subscription, is now nearly completed.

The well in the Rohtak dispensary, a very deep and fine one, which was completed in 1880, this year required some small repairs, and it is now in satisfactory order.

Just outside Rohtak there is the remains of a very fine old Bauli, built originally, for the most part, of solid blocks of kaakar. This has been taken in hand, and the side walls have been repaired and the steps cleared. But a great deal still requires to be done before the Bauli can become of practical use to the people.

The total amount sanctioned for making necessary additions and alterations to this fine well is Rs. 850 debitable to the following funds:—

District fund	...	...	...	Rs. 500
Municipal do.	...	...	...	" 200
Subscription	...	...	...	" 150
				Total Rs. 850

<i>Rohtak Municipality.</i> —Construction of a bridge near Gopál Rai's Garden and kacha road from Sittá Mandar to Gau Karon tank	...	...	...	Rs. 98
Kacha road near Mohalla Rahbari	...	...	...	" 100
Paving a street	...	...	...	" 19
Enclosure wall to surround the area used for depositing filth	...	...	...	" 31
<i>Gohána Municipality.</i> —Metalling a street	...	...	...	" 189
Compound wall to enclose the area selected for depositing rubbish	...	...	...	" 70
<i>Beri Municipality.</i> —Metalling a street near Paras of Bairágián	...	...	...	" 200
Pukka road near gate called Boharwála	...	...	...	" 50
Paving a street	...	...	...	" 7
Construction of a slaughter-house outside the town of Jhajjar	...	...	...	" 200

Very considerable advance has been made in the general extension of tree planting by each municipality, and the holes are now ready for the young saplings, which will shortly be placed in them.

The number of public latrines in working order, were as follows:—

Rohtak Municipality	...	...	...	5
Jhajjar do.	...	...	...	5
Beri do.	...	...	...	9
Bahadurgarh do.	...	...	...	2
Kharkhoda do.	...	...	...	2
Gohána do.	...	...	...	2

The refuse matter is deposited in *Kháttas*, or pits, dug for the purpose, at a distance of some 200 yards from the town; 14 donkeys have this year been appointed in the Rohtak town for removing offensive matter and rubbish from the premises; and 3 extra sweepers, 2 in Beri and the other in Jhajjar, have been appointed for the purpose of storing dry earth near every latrine.

SIRSA.

Only one drain for carrying off the main water of the town of Sirsa was repaired. A pukka well was constructed in a street called Talion-ka-bas to the North, for the benefit of that part of the town, there being no well close by. The people subscribed Rs. 100 towards its construction. Hollows and pits of the town were filled up and levelled to prevent accumulation of water during the rains. At Sirsa there are three latrines in working order. The refuse is buried in trenches 200 paces distant from the town.

Fazilka.—Two of the wells under construction were completed this year. Two of the wells were cleared, and the platform of one well constructed. Some of the tanks were also cleared. There were certain depressions in this town; they were filled up with earth and levelled for the free passage of rain water. There are two latrines, and they are kept in good order. The refuse is deposited in the same way as in Sirsa.

Ellenabad.—The landing *ghat* to the tank of this town was completed during the year. The two wells of the town were also cleaned. This Municipality has no public latrines. But there are pillars erected not less than 200 paces away from the town beyond which the people are required to relieve the calls of nature. A breach of this defined arrangement subjects the offender to a small fine. A pit of this town was filled up with earth.

UMBALLA.

During the year, one latrine was constructed at Jagádhi, one at Rugar and one at Sadhaura. Some improvements to pavements and roads have been made at Umballa, Jagádhi, Rugar, Buriya Ladwa, Kharar, and Shahabad towns.

LUDHIANA.

Seventy pukka and fifteen kacha drains were repaired. Water is taken from wells which are kept clean, and from the Budha Nullah which skirts one part of the town, to which the people resort for their supply. This is watched by a policeman who is posted there to see that no filth of any kind is thrown into the stream. There is little doubt that the well water of all large towns, however good it may have originally been, eventually deteriorates from surface pollution, and, as a first step towards remedying this evil, the wells in the town of Ludhiána are being covered in with close wooden covers with hinged hatches to open and shut for taking out water. This, with careful annual cleaning out, will, it is believed, be a step in advance. For its supervision an establishment costing Rs. 245 per month, or Rs. 2,940 per annum, is maintained, *viz*: 1 Superintendent @ Rs. 100; 3 Deputy Superintendents @ Rs. 20; 10 Jamadars @ Rs. 8 and 1 Peon @ Rs. 5—per month. These move about the whole district and submit weekly reports of villages inspected, and during the winter tour the Deputy Commissioner visits localities and makes enquiries. There are 15 bullock carts and 60 donkeys, costing Rs. 250 per mensem for feed and keep, which are solely employed to convey the filth daily to a spot across the Budha Nullah to the North side of the town, and another place near the Samrala road on the East side, from whence it is bought, by Zamindars and others, for agricultural purposes at 4 or 6 annas per cart load, and 6 pies per donkey load. During the year under report a sum of Rs. 5,079 was realized from sale of manure. The town levels and the ground waterworks scheme, drawn up by Mr. Hammer, is still before the Government for sanction. The map of the town of Ludhiána and its suburbs is being done by Mr. Hall, Municipal Surveyor engaged on Rs. 100 per mensem, on a large scale which will be most useful when completed for reference in cases of land disputes, encroachment on roads, *Nazul* property, &c. There are 100 moveable latrines all over the town and station, fixed in fine convenient spots, from each of which the filth is carried away daily by carts or donkeys to the spot set apart across the Budha Nullah for storage, from whence it is disposed of to cultivators and others.

SIMLA.

The Deputy Commissioner of Simla regrets that he is unable to report that any conservancy scheme embracing the Main bázár or the whole station of Simla has yet been put in hand; but the prospect of a complete project being sanctioned and commenced is certainly more hopeful than it was twelve months ago. He has never ceased to urge the importance of this matter on Government; the large number of buildings being erected for public offices and residences for the Government establishments makes it every day a more urgent want.

JULLUNDUR.

As reported last year, a project which comprises the construction of three wells in the town of Jullundur for flushing main drains with water, in connection with the internal drainage scheme, was sanctioned in March 1880. One of these wells was sunk in 1880, and the second during the year under report. The construction of the third well has been postponed, and the sanctioned provision is being employed on the improvement of side drains so as to ensure a proper flow.

Rs. 395 have been spent in extending the three pukka drains to the South-west of the town.

Bungah.—On the Civil Surgeon's report endorsed by the Sanitary Commissioner, a proposition had been made and sanctioned by the Commissioner for the construction of a channel to carry off the storm water which collects round the town. The estimate amounts to Rs. 1,790, but, owing to want of funds, nothing could be done during the year. A provision of Rs. 1,500 has been made in the current year's Budget, and it is hoped the project will be completed before the coming rains.

During the year under report, when cholera was raging in the town of Jullundur, all wells for drinking purposes were cleaned out at a cost of Rs. 412. The wells at Bungah were also cleaned, and Rs. 140 spent on the construction of a well at the dispensary; this amount represents half the cost; the other moiety has been defrayed from the District fund.

The system hitherto in force at Jullundur of *Chobachchas*, or sinks, for the collection of household refuse in all paved streets has been stopped, as these sinks are considered objectionable on sanitary grounds by the Medical officers. In unpaved streets these sinks continue till funds are available for carrying out some thoroughly improved system of sewage drainage.

Two female latrines, one at Nakodar, and the other at Kartarpur, have been constructed.

Cutting off the spills from the jhils to the North of Jullundur, and conveying them by means of an open channel into the East Beyne Nullah at a point about 8 miles North of Jullundur.—This work is a District one, carried out under the immediate direction of the Deputy Commissioner of Jullundur, and consisted in tapping a number of *jhils* situated to the North of Jullundur in the direction of Hoshiárpur, and conveying the spill water by means of a large channel away to the East Beyne river. The spills from these *jhils* in former years came down upon the city and cantonments of Jullundur, and used to completely swamp the land around the former, to which was attributed much of the fever from which the inhabitants of the city suffered during and after the rains. The measures taken have proved very successful, as little or no water found its way down this year, and beneficial results may fairly be anticipated to arise from the works just finished.

HOSHIARPUR.

In 1881 a sum of Rs. 2,325 was spent on the construction of a large sewer in Mohalla Raiyan, a very important branch of the drainage of Hoshiárpur town.

On the paving of the town of Una about Rs. 190 were spent.

Special attention was paid to the drainage of the village of Chintpurni, where in the autumn a very large fair is held (20,000 or 30,000 visitors). Bathing is carried on in a tank which is largely supplied by the storm drainage which runs from the town situated above it. The spot was visited by the Deputy Commissioner during the fair, and he arranged with the inhabitants that they, at their own cost, should make a proper drain to divert the drainage from flowing into the tank. There is a very substantial old drain which, from want of repair, is useless. This, it is hoped, will soon be in good order.

At Mokerian a large hollow was filled up near the school at a cost of Rs. 100.

I.—Draining the jhil at Dasuyah in Hoshiárpur district.

II.—Cleaning the Swa Nullah in the Hoshiárpur district.

The first work was completed at the commencement of the current official year at a cost of Rs. 3,596, and consisted in draining a *jhil* of about one square mile in extent situated immediately around and extending beyond the town of Dasuyah. The object was attained by means of open channels cut through the *jhil* to low ground beyond it and has proved very successful, the whole area which was formerly *jhil* being now brought under cultivation.

The second work has just been brought to a close at a cost of Rs. 1,821, and consisted of opening up the old bed of the Swa Nullah situated between the newly embanked portion of the Nowshera and Mian road, and connecting the same with the river Beas, with a view to prevent the low land parallel to the embankment, and situated between it and the left bank of the Beas, from becoming water-logged during heavy rains and frequent spills from the Beas, to which it is liable since the construction of the embankment in question, which shuts off the spill of the Beas from flowing into the *jhil*, forming the source of the West Beyne river and causes it to stand upon the strip of low land mentioned. This has not yet had floods over it since completion, but good results are anticipated to the villages situated upon the low land in question.

The tahsil and neighbourhood had been found damp and unhealthy, and the work was carried out entirely with sanitary objects.

On the town of Dasuyah, the Municipal Committee spent about Rs. 131 in improving its pavement.

The wells in the town of Hoshiárpur were cleaned and repaired as below:—

Cleaning wells	...	...	...	Rs. 245
Repairs to well of Lachman Dás	...	...	...	" 121
Do. do. near Sundé Khan's Masjid	...	...	...	" 25
Do. do. in Bázár Purani Abkári	...	...	...	" 25
Do. do. of Gainda at Khánpur	...	...	...	" 50
Do. do. of Ghulam Hasan, Khánpur	...	...	...	" 25
Do. do. near Masjid Pir Muhammad, Khánpur	...	...	...	" 25
Do. do. of sweepers at Bahádurpur	...	...	...	" 70
Do. do. of Gheyon at Hoshiárpur	...	...	...	" 47
				<u>Total Rs. 633</u>

Polo Mal's Tank in Hoshiárpur was filled at a cost of Rs. 88.

In the town of Mokerián the wells were cleaned three times.

In the village of Paddi Súra Singh, a sloping approach for watering cattle was added to the village tank by the District Committee.

The tanks below noted have been enlarged or re-dug by the District Committee at the cost shown opposite each:—

Tank at Mangowál	...	...	...	Rs. 261
Do. Kothi Kangar	...	...	...	" 46
Do. Dharampur	...	...	...	" 40
Do. Amboya	...	...	...	" 75
Do. Bichoi	...	...	...	" 50
Do. Panjáwar	...	...	...	" 200
Do. Paldi	...	...	...	" 313
				<u>Total Rs. 985</u>

After the cholera epidemic a map was prepared, showing the position of each well in the town and the position in which each case of cholera occurred.

During the epidemic two wells which were suspected, one in the village of Sotheri and one in Premgarh, were shut up.

Another well has been repaired in Hoshiárpur with a parapet sloping outward, as described in last year's report. This form of parapet is a very great help in maintaining the purity of the water, and it is hoped that as wells are gradually repaired they may be all furnished with this form of parapet.

During the year, most of the latrines in Hoshiárpur have been much improved by being provided with slabs of stone at the seats.

KANGRA.

The following sanitary works were constructed during the year under report:—

Paving Dharmśála bázár	...	...	...	Rs. 100
Do. Kángra do.	...	...	...	" 325
Do. Núrpúr do.	...	...	...	" 25

With the exception of Kángra, Núrpúr and Dharmśála there are no drains, as the district is a hilly one. The drains in the towns mentioned are always kept clean and in good order.

There are no water-supply works in this district with the exception of a canal at Dharmśála, which is supplied from the snowy streams; and the use of the water is subject to a tax on each house in the station. The general condition of the sources of water-supply in the district is good. Wells and baulis are kept clean.

The attention of Tahsildárs is drawn to the instructions issued by the Sanitary Commissioner on the subject of improvements to village sites.

The usual conservancy establishment was kept up during the year, the cost of which is shown in the Income and Expenditure Statement.

No special works of sanitary improvements were constructed during the year.

No village committees have been appointed in any part of the district, as in a hill district like this no special arrangement appears necessary; but the Municipal and District Committees generally superintend such arrangements.

There are only two latrines at upper and lower Dharmśāla in working order, the refuse of which is removed by the sweepers and buried at a spot selected for the purpose; while the private latrines in other towns are kept clean. The bázár and streets are swept regularly by the establishment employed for this purpose.

AMRITSAR.

The main drainage scheme is nearly completed round the Eastern side of the city. The sections already completed stood the strain of the year's unusually heavy rainfall without anywhere showing signs of weakness or want of capacity. The internal drainage was improved by the adjustment of street drains with the outer main drain, and several old drains were renewed and repaired.

A change was made in the conservancy arrangements at the beginning of the official year. The duty of cleaning the city remained in the hands of the Committee, but the carrying establishment was made over to a contractor, who also had the right to dispose of all the sweepings to his own advantage. He obtained a lease for 5 years on payment of Rs. 17,200 per annum to the Committee. In a pecuniary point of view this was an advantageous arrangement for the Committee. Shortly after the contractor began work, it was evident that he was not equal to the strain, and things went from bad to worse till the sickness became epidemic. The Committee was then obliged to dismiss the contractor and to take the whole arrangements into its own hand again. It is quite evident that the conservancy of a large town like Amritsar is best managed by the Committee itself, which has greater resources at its disposal than a contractor, and which is more interested in obtaining cleanliness than profit.

During the year it was proposed by the Committee to establish a light tramway round the East and West of the city for the purpose of rapidly removing the manure daily from the city to the extramural depôts. Estimates are being prepared and the work will no doubt be put in hand during 1882-83. Of the advantages of the plan there can be no two opinions. The removal of manure employs 500 donkeys working all day. By means of a tramway drawn by horses the same quantity of stuff could be removed in less than half the time, and at much less cost.

The wells of the city were cleaned out, but it is feared that the good done to the water by this measure was shortly after undone by the heavy rains which caused a rise in the water level. After the rains, the water of several wells that had, it was thought, become polluted, was removed. In future the Committee propose to carry out a systematic cleaning of wells.

Two ranges of the Crawford Privy have been obtained from Bombay. Each range has 5 compartments and is made entirely of angle-iron and corrugated zinc sheets. The receptacle for the fæces is in the form of an elongated scuttle, with a deep slope, and there is a zinc bucket behind into which the stuff shoots by gravitation. The privy is capable of being kept very clean and can be removed from place to place. It is strongly put together and is roofed at a height of 10 feet from the ground level.

GURDASPUR.

Gurdaspur.—Completing a latrine; repairs to road of Sadr bázár; other petty repairs to paving and drains.

Dinanagar.—Drain of Taragari gate and of Awanki gate repaired; pavings of 19 streets costing less than Rs. 200 each; parapet of a well; petty repairs to paving and drains.

Kalanaur.—Petty repairs to paving of streets.

Bahrapur.—Repairs to three gateways.

Pathankot.—Paving of three streets; "ponah" or female bathing place of a Baulí; bridge over the road leading to Marian.

Sujanpur.—Paving and drains of streets costing Rs. 858; building a well in the dispensary; repairs to a Baulí.

Shahpur.—Steps of a tank.

Narot.—Three bridges costing Rs. 981; repairs to a bridge and to paving.

Batala.—Paving of six streets, town wall, steps of Shamsheer Khanwála tank; repairs to Baradari in the centre of Shamsheer Khanwála tank; metalling Circular, Teli gate, and Khajuri gate roads; petty repairs to pavings of streets and drains.

Dera Nanak.—Paving of three streets; three godowns for storing town sweepings; and boundary pillars.

Fatehgarh.—Two side drains.

Sakhochak.—A well, and paving of streets.

Dirman.—Repairs to a tank.

Kot Naina.—Petty repairs to a well and street.

No village committees have been appointed in the district to superintend the sanitary arrangements, but officers, when visiting the interior of the district, are expected to satisfy themselves that such arrangements are not neglected. Attention is paid to cleaning out of wells, removal of noxious vegetation, and collection of refuse at convenient distances from the habitation sites; Zaildárs and Lambardárs are held personally responsible in such matters; no real practical improvement in village sanitation can be expected, however, until legislation affords the means of legally enforcing the same. Conservancy funds for each village are also needed to provide some establishment for the above purpose, and, in default of special legislation, opportunity might be taken at the next settlement to improve some trifling village rate sufficient to pay for conservancy arrangements.

SIÁLKOT.

The drains in the city were repaired, and new pukka pavements laid down in 14 bázárs or streets in the town of Siáلكot.

At Pasrúr two streets have been newly paved.

Wells have been repaired in the Siáلكot city and supplied with reservoirs and gutters for waste water.

The following works were in progress at the close of the year:—

Pavements in Mianapura, a suburb of Siáلكot.

Pavements in the town of Jamki.

A sarái at Killa Soba Singh for travellers.

An estimate and plan for a large pukka tank on the road from Jammú to the city of Siáلكot, which will be useful for travellers as well as for the residents of the city, are under consideration.

The following will show how far the suggestions of the Sanitary Commissioner have been carried out, and the matters that are still under consideration.

(a).—Pavements of main streets have been repaired and drains put in order. To give the work a start, Rs. 2,000 have been provided in the ensuing year's Budget for the circular drain, which the Sanitary Commissioner has recommended to be constructed to receive the sewage of the interior drains of the city, and it has been resolved to provide Rs. 2,000 or more annually, as funds are available, to complete the work; some delay has taken place as difficulty has been experienced in preparing the projects for submission to Government for sanction, and the assistance of the Public Works Department has been applied for.

(b).—It has been resolved to change the present system of disposing of the city night-soil and refuse, and to establish store godowns; two of these have already been built, and sites for five more have been selected.

(c).—The cylinders and platforms of 10 of the wells in the city have been repaired thoroughly. The embankments have been made to slope outwards to prevent water running back into the well, and gutters have been made to receive the waste water and carry it into the street drain.

(d).—The conservancy establishment will be increased on the completion of the godowns and the introduction of the new system of collecting and disposing of night-soil.

(e).—Existing latrines have been repaired. When required, new latrines will be built on the plan suggested by the Sanitary Commissioner, viz., roofed and provided with ventilation. Glazed receptacles will be supplied in all latrines.

(f).—Nothing has as yet been done, as the plan and estimate of the slaughter-house at Delhi, which was pointed out as a model by the Sanitary Commissioner, though repeatedly asked for, have not yet been received.

LAHORE.

Towards the close of the year the drainage works of the city, and the metalling of its roads were commenced on an estimate sanctioned for Rs. 168,500. The works are progressing satisfactorily, and now that the sanctioned loan has been received, it will be possible to meet the claims of contractors for work done, and the scheme will be pushed to a speedy completion.

The completion of these works will leave little to be desired in the thorough conservancy of the town.

Although the Lahore Municipality has not been able to undertake many measures of improvement owing to the heavy demands on its resources, yet, the year under report has not been unproductive of some good results.

The following important works were executed at the expense of the Committee :—

- 1.—Garden round the Government College.
- 2.—Ghazanfar Chauk garden, opposite Tahsíl.
- 3.—Improving ground plots near the Chief Court.
- 4.—New road to Shálamár.
- 5.—Improving site of Kharak Singh's Haveli.
- 6.—Culvert on Lahore road.
- 7.—Connecting sewer at Masti gate with Fort drain.
- 8.—Water course along fencing of P. N. S. Railway at Yakki gate.
- 9.—Repairs to latrines.
- 10.—Repairs to roads and drains.

GUJRANWALA.

In Gujranwála the following works were undertaken :—

- 1.—Filling holes, and metalling bázár in Kattrá Desa Singh, at a cost of Rs. 2,445.
- 2.—Paving bázár near Gujrati gate, at a cost of Rs. 545.
- 3.—Converting a large pond near the Dák Bangalow into a kacha tank at a cost of Rs. 1,107.
- 4.—Making mural godowns at a cost of Rs. 1,508.

The first two works are considered important as regards drainage; the last two as regards water supply and conservancy.

Besides this expenditure, Rs. 2,178 were laid out in metalling city roads and bridges; Rs. 700 in cleaning tanks; and Rs. 2,767 in repairing pavements of the principal bázárs and streets.

In the town of Wazirabad Rs. 2,150 were spent on re-metalling the main bázár to improve drainage and conservancy; Rs. 483 on filling a filthy pond near the old Dák Bangalow; Rs. 500 on making a pukka drain from the Akalgarh gate to the Sarái, to carry sewage to the main or "Palkú" stream; and Rs. 1,684 were expended on repairing pavements. In the other towns no works, except the necessary repairs to pavements, were undertaken for want of funds.

In Municipal towns the Tahsildárs and Members pay proper attention to the conservancy arrangements. No village committees have yet been appointed. The Lambardárs are held responsible for the cleanliness of their villages. Much attention has been paid to the village conservancy during the year under report. In large villages, sweepers have been appointed, circular roads have been marked out, and mud-pillars fixed in accordance with the suggestions of the Sanitary Commissioner and Civil Surgeon.

FEROZEPORE.

No sanitary works were executed or were in progress in 1881 in any of the Municipal towns in this district.

RAWALPINDI.

No new drainage works were undertaken in any Municipality.

Rawalpindi.—Rs. 444 were spent on the experimental well for water-supply to the city commenced in 1880. The whole scheme in connection with the well is now being supervised in the Superintending Engineer's office, and it is hoped that work will be resumed this year. Rs. 582 were spent in completing a *jhállár* for watering roads commenced in 1880. The ordinary cleaning of the 48 wells in the city cost Rs. 526.

Rs. 3,981 were spent on repairs to roads; Rs. 549 on repairs to streets; and Rs. 1,330 on pukka drains to 15 latrines.

Hazro.—Rs. 550 were spent in cleaning out the Municipal tank; Rs. 125 on repairs to streets; Rs. 324 on roads; and Rs. 42 on repairs to latrines.

Pindi Gheb.—Rs. 50 were spent on *chobacha* to a well.

Attock.—Rs. 137 were spent on repairs to streets, and Rs. 28 on repairs to a temporary latrine.

Makhud.—Rs. 394 were laid out on repairs to roads.

No regular village committee has been appointed in the district, but the attention of Tahsildárs has been called to recent instructions regarding village conservancy, especially in regard to water-supply.

Thirty-one public latrines were in working order during the year under report, *viz.* :—

Rawalpindi city, 26; Attock, 1; Hazro, 2; Makhud, 2.

At Rawalpindi, filth is buried in four spots at a distance from the city; at Attock, in one selected spot; at Hazro, in two selected spots; at Makhud, in one spot. In all Municipalities except Makhud the filth is sold when decomposed.

JHELUM.

New drains were constructed during the year under report in Pind Dádan Khán and Jhelum municipal towns, due attention being paid to their cleanliness.

The wells and tanks were duly cleaned as usual. Considerable expenditure was incurred in the construction of a new tank at Pind Dádan Khán, where the water of all the wells in the town is brackish. In other towns of the district the water of the wells is good and plentiful.

GUJRAT.

Paving of streets was undertaken in the towns of Gujrat and Jalalpur.

Repairs to certain drains were also effected in the towns of Gujrat and Jalalpur, costing Rs. 203.

Rs. 292 have been spent in the repairs and cleaning of wells at Gujrat.

" 191	ditto	ditto	at Jalalpur.
" 99	ditto	ditto	at Dingah.
" 148	ditto	ditto	at Kunjah.

The conservancy arrangements of the four Municipalities are fairly carried out, and the establishments of the Gujrat, Jalalpur, Kunjah and Dingah Municipalities are kept up to their duties.

SHAHPUR.

Drains and sewers in all the towns were kept in a state of repair and cleanliness; Rs. 107 were expended on repairing drains in Bhera.

The canal cut mentioned in last year's report was completed at a cost of Rs. 4,500. This work has proved a great benefit to the town of Khushab, as, besides facilitating the supply of water for drinking purposes, it will be utilized for flushing the drains and sewers. A new tank costing Rs. 300 was constructed at Khushab. New wells at Miani and Girot were sunk at a cost of Rs. 200 and Rs. 338 respectively.

Besides the above-mentioned new works, the following sums were expended on repairing tanks and wells, viz:—

Bhera	...	...	...	Rs. 424
Miani	...	...	...	" 20
Sahiwal	...	...	...	" 225
Khushab	...	...	...	" 355
Girot	...	...	...	" 5

Rs. 50 at Bhera and Rs. 60 at Girot were expended on repairing latrines. Roads were metalled at Bhera and Miani at a cost of Rs. 2,594 and Rs. 3,755 respectively; while a sum of Rs. 394 was expended on repairing roads, viz:—

Bhera	...	...	...	Rs. 190
Miani	...	...	...	" 124
Khushab	...	...	...	" 80

A new bridge was constructed at Sahiwal at a cost of Rs. 200, and 2 smaller ones at Rs. 20 each. At Girot a bridge was constructed at a cost of Rs. 30.

The cost of paving new streets in the larger towns and repairing the existing pavements is shown in the following statement.

Name of town.	Amount expended on	
	new works.	repairs.
	Rs.	Rs.
Bhera	962	...
Sahiwal	...	27
Khushab	350	175
Girot	93	60
TOTAL	1,405	262

MOOLTAN.

As the survey of the city has been completed, the construction of drains and pavement of streets will from the commencement of the next financial year, be taken up on an organized system.

The 425 wells in the city were thoroughly cleaned out at a cost of Rs. 399. The wells at Shujabad were likewise cleaned.

Ten new latrines were constructed at a cost of Rs. 855 at places where they were most needed, all of them being without the city walls.

JHANG.

No sanitary works were executed or were in progress during the year under report in the Municipal towns of Chiniot and Ahmadpur. Some sanitary works were executed in Jhang *cum* Maghiana. At Shorkot, too, some sanitary works, on a small scale, were carried out. The following is a brief account of all such works:—

A number of small drains, the aggregate cost of which amounted to Rs. 392-1-9, was constructed in Jhang and Maghiana.

No works were executed in any of the four Municipalities during the year, with the exception of some steps to the Jhandiwála tank at Maghiana; the outlay on this amounted to Rs. 236.

It may be mentioned that about 17 small streets were paved in Jhang and Maghiana. The expense aggregated Rs. 2,188. Some bázár streets were paved at Shorkot at a cost of Rs. 198-9-6.

The following works, constructed during the year, may be included under this head:—

1.—Constructing a latrine at Jhang near Golabwála well	...	Rs. 189	6	0
2.— Ditto 2 latrines at Maghiana near Jogiwála well	...	" 335	9	0
3.— Ditto 2 do. Maghiana near Budhewála well	...	" 283	5	0
4.— Ditto 2 do. near Pipalwála well at Maghiana	...	" 301	0	0
5.— Ditto 2 slaughter-houses, (1 at Jhang and 1 at Maghiana)	...	" 164	9	3

A road near the Jhang Municipal Committee house was railed at a cost of Rs. 240. A small bridge was made over a drain at Maghiana at an outlay of Rs. 18.

MONTGOMERY.

Montgomery.—The following sums have been expended on sanitary improvements, *viz.*:—

1.—Cleaning drains	...	Rs. 85	0	0
2.—Repairs to a tank	...	" 6	0	0
3.— Do. to a road which passes through Pák Pattan gate	...	" 14	9	0
4.—Cleaning of a well near tank	...	" 9	8	0
5.—Repairs to railings of tank	...	" 14	0	0
<i>Kamalia.</i> —1.—Pavement of a street	...	" 52	13	9
2.—Repairs to the Committee well	...	" 7	14	0

During the year under report the drains at Montgomery have been cleaned.

MUZAFFARGARH.

Side drains in the street pavements were made in the Municipal towns noted below:—

Alipur	...	Rs. 248	11	0
Khangarh	...	" 230	0	0
Muzaffargarh	...	" 101	6	10
Jatoi	...	" 74	0	0

The only large drainage scheme that is being carried out is the Ruhillánwála Tál. It is in charge of the Executive Engineer, Muzaffargarh Canal Division. "It consists of a main line of about 10 miles long and a branch, the Daira Vaddhú, about 6 miles long. All the canals that used to swamp the tract traversed by the drain now tail into it. In making the drain, advantage was taken of a series of depressions. These were cleared out and short cuts made from one to the other. The people have subscribed the labor from year to year, and the land was given for nothing. The main line will be eventually about 20 miles long tailing into the Chenab just above Shahr Sultán."

Most of the wells in the municipal towns and in some of the minor towns were provided with masonry copings all round, and with drains to run the refuse to a distance. The cost was about Rs. 590-1-9 from Municipal, and Rs. 554 from District funds. More estimates were passed after

the close of the year. Two new wells are being made at Khairpur and Khangarh. The water in the wells is kept clean, naturally by the great rise in the water which occurs during the hot weather. They were also cleaned with the *toba*, i.e., all rubbish such as broken pots, stones, reeds, &c., were taken out by divers.

Estimates aggregating Rs. 987 were sanctioned for paving streets in 5 municipal towns, and the greater portion of the work was completed at the close of the year. The circular road round Muzaffargarh was metalled at a cost of Rs. 855. Improved awnings over the lanes were put up in some towns.

DERA ISMAIL KHAN.

In the city of Dera Ismail Khan drains on both sides of the road from the main bazaar to Thittarawala gate were completed during the year at a cost of Rs. 500.

The water-supply is good and plentiful. The wells in mohallas have been kept clean.

Little was done to improve village sites, beyond arranging for the transfer of the village of Maddi to a higher and drier site. Only six or seven families now remain to be removed.

In the city of Dera Ismail Khan sweepers with their donkeys are employed to convey refuse, night soil, &c., &c. from mohallas and streets to intra-mural godowns, and from thence the refuse is conveyed by six conservancy carts to extra-mural ones situated about $\frac{3}{4}$ mile from the city; the refuse thus collected and stored realized Rs. 1,195, leaving a large stock on hand for disposal during current year; as there are only some 20 wells in the vicinity of the city, and the area irrigated from the Suni is small, there is not much demand for the city refuse.

Committees have been formed in the following villages, viz.:—Draband, Chandhwan and Vehowah, who look after the sanitary arrangements of their respective villages.

Latrines are kept clean by a separate establishment of sweepers, and the filth removed daily to trenches at some distance from the towns and sold as manure after deodorization has taken place.

The sums realized during the year under report are as follows:—

Dera	...	...	...	...	Rs. 927
Leiah	...	...	...	...	260
Paharpur	...	...	...	...	8
					Total Rs. 1,195

DERA GHAZI KHAN.

The sanitary works constructed were, as usual, extension and repairs of drains, construction of culverts and bridges, clearing out of wells, &c. Paving of streets was somewhat extensively carried out during the year under report, the advantages from which, in a sanitary point of view are considerable.

The number of latrines were the same as during the year previous, viz. 30; they are kept scrupulously clean, the dry-earth system being in force.

BANNU.

No report received up to date 16th May notwithstanding several reminders were sent to the Deputy Commissioner.

PESHAWAR.

The Civil Surgeon has in his Annual Report described the new channel, now almost complete, under construction in the city of Peshawar which has a central channel for drinking water, and two lateral ones for sewage, the latter being on a lower level than the former. He has also pointed out the disadvantage of the water, before it reaches the channel in the city being allowed to pass close to the Sadr bazaar of the Cantonment and other public places in an open stream. The Cantonment will be supplied with filtered water carried in pipes, in a few days it is hoped.

Conservancy of Peshawar city is very good; there is a large number of municipal conservancy carts by which the refuse excreta, etc., are taken to a distance and buried in trenches; the city generally is very clean, though there are a few parts of it that are capable of improvement.

There are six public latrines for the city, and three for the Cantonment of Peshawar, they are kept in good order, and the refuse is disposed of in cultivated land.

HAZARA.

Improvements in drainage in Abbottabad, Haripur and Buffa. In the two latter the works are still being extended.

The water-supply in wells and springs was normal. All wells at encamping grounds and in Municipalities, Civil lines, Cantonments, Tahsils and Thanas have been cleared, and there are none elsewhere to speak of.

KOHAT.

Two slaughter-houses were constructed for slaughter of cattle during the year under report, at a cost of Rs. 909-8-0, one to the North and the other to the South of the city.

There are three latrines in working order. Refuse is buried in trenches outside and to the South of the city in a direction opposed to the prevailing winds.

SECTION X.—GENERAL REMARKS & PERSONAL PROCEEDINGS.

104. I held charge of the office of Sanitary Commissioner, Punjab, during the entire year. In October 1881 I was appointed Secretary and Member of the Special Cholera Committee already referred to in para. 25, Section VIIA. of this report. During the whole of that month the Committee was engaged in the investigation of the circumstances connected with the outbreak of the disease in certain parts of the Province, which they visited. From that time to the present I have been employed, in addition to my own duties of Sanitary Commissioner, which owing to the introduction of the Revised Vaccine Scheme have been more than usually heavy, in the compilation of the history of Cholera in India in connection with the work of the Special Committee on cholera. I have in consequence been prevented from making my usual cold weather tour of inspection of towns and villages during the year. In this respect, however, a good deal has been done by the Deputy Sanitary Commissioners, and some of the Civil Surgeons, also, have done good work in this direction. Under the recent orders of the Local Government Civil Surgeons are now held responsible for the Medical administration of their respective districts and in future a more systematic inspection of towns and villages in their districts will be looked for. Surgeon-Major J. Bennett, Deputy Sanitary Commissioner remained in charge of the Eastern Circle throughout the year, and Surgeon-Major G. Massy of the Western Circle up to 3rd November 1881, after which date he was transferred to the Civil Surgeony of Rawalpindi and was succeeded by Surgeon J. O'Neill. All these officers have rendered me very great assistance in the administration of Vaccination and Sanitary Departments.

105. The Director of Public Instruction has furnished me with a list of all Middle Schools, Government and Aided, in this Province in the 3rd Class of all of which Dr. Cunningham's Sanitary Primer. Dr. Cunningham's Sanitary Primer is now taught. The number of such institutions is 202. Last year the primer was distributed among the people generally and during the year under review all the vaccinators in the several districts of the Province, also, have been supplied with a copy. As the vaccinators will be employed in sanitary work in the non-vaccinating season it has been ruled that one of the duties of the Civil Surgeon will be to train the staff of vaccinators under his orders in the elementary principles of general sanitation and domestic hygiene so as to qualify them for employment as aids in sanitary work. Very satisfactory results in the great work of educating the people on these subjects may therefore be expected in the course of a few years by this arrangement.

106. The orders conveyed in para. 5 of the Government of India letter No. 282, dated 30th November 1881, to the address of the Secretary to Government, Punjab, directing that special notice be made in future Sanitary Reports "on the extent to which action has been taken on any suggestions which may from time to time be made by the Army Sanitary Commission" will be acted up to in future.

In the memorandum by the Army Sanitary Commission in the Punjab Sanitary Report for 1879 attention is invited to the points noted in the following paragraphs:

Remarks by Sanitary Commissioner.

Para. 19.—Regarding expenditure on Civil Sanitary works.

On this subject the Army Sanitary Commission after remarking upon the total sanitary charges paid from Municipal Funds observes that "the total spent on these sanitary works in 32 Municipal towns was thus less by £7,706 than the less appropriated balance of the year" and adds that "with this fact before us, are we not justified in suggesting that a better way of dealing with the balance would have been to have spent it in saving the lives of those who contributed the money, than to have simply laid it aside."

As I have no executive authority, nor control over the funds of the municipalities, I regret, I can supply no information on this head.

The special report asked for should be submitted by the Secretary to Government, Punjab, Public Works Department.

See page 91, Section IX, Sanitary Works—Civil, of this report.

This is a Military undertaking regarding which there is no information in this office.

Para. 20.—Regarding the projected water-supply of Delhi as to which a special report should be submitted.

Para. 21.—Relative to a scheme for draining the city of Amritsar.

Para. 24.—Regarding the early completion of the Pesháwar water-works.

Para. 26.—Village Conservancy.

What has already been done on this subject has been noticed from time to time in the several Sanitary Reports of this Province, and need not to be re-produced here in any detail.

The simple sanitary rules, printed at page 45 of my Sanitary Report for 1877, have been distributed to all the Municipal and District Committees, and to some extent acted upon in a few districts, more particularly in those of Muzaffargarh and Jhang. In the latter district the Civil Surgeon Rai Bahadur Chetun Shah after his inspection of a town or village convenes a Special Sanitary meeting of the people at which the subjects of conservancy, water-supply, domestic hygiene, &c., &c., are freely discussed. In some places the Civil Surgeon's arguments in favor of sanitation have been productive of not only promises of co-operation and assistance on their part, but also in the more tangible form of raising funds by private subscriptions wherewith to at once carry out the sanitary improvements suggested.

107. In para. 196 of my report of last year I have briefly discussed the method of my own procedure, at these meetings, (meetings which I have myself always been in the habit of conducting after my inspection of a town or village) for the guidance of the Deputy Sanitary Commissioners and the Civil Surgeons, whose duties, under the re-organized scheme are as follows:

I.—Rules defining the duties of a Deputy Sanitary Commissioner, Punjab.

1. The most important duty of a Deputy Sanitary Commissioner will be the general supervision and verification of vaccine operations within the limits of his circle. He will be responsible for the adequate supply of vaccine lymph in his circle; will enquire into the character and quality of the vaccine operations performed, under the management of the Civil Surgeons, by the several district-vaccinators in his circle; and verify the results of their operations. He will use every reasonable endeavour to extend the practice of vaccination equally throughout his circle, and will explain the origin, history, and advantages of vaccination to members of municipal committees, village headmen, and natives of influence and position, whenever opportunity occurs.

2. The improvement of birth and death registration in all parts of his circle will be an important duty of a Deputy Sanitary Commissioner. He will as often as possible examine the village chaukidars' memorandum books of births and deaths and verify the entries by enquiry on the spot. He will also examine the birth and death registers and returns kept at the police and municipal offices in all parts of his circle; he will note the condition of the registers and returns, the correctness or otherwise of the entries and total additions, and the probable amount of attention given to registration; and will record the results of each examination in the police station visitors' book, or the municipal secretary's minute-book, for the information of the Superintendent of Police or the Municipal Committee, as the case may be.

3. The sanitary inspection of towns and villages in all parts of his circle visited during tours or journeys will form an essential part of the duties of a Deputy Sanitary Commissioner. A record of circumstances likely to produce disease will be made by the Deputy Sanitary Commissioner at the time of inspection, and a report thereof submitted to the Sanitary Commissioner for transmission to Government with such recommendations for improvement in the sanitary aspect of the site as may seem advisable.

4. The attention of Deputy Sanitary Commissioners should also be given to the furtherance of measures for the improvement of the sanitary condition of villages, and efforts should be made to persuade villagers to abandon practices which tend to produce unhealthiness, especially in matters relating to village conservancy, the protection of wells, tanks, and other sources of water-supply from preventible causes of pollution, and the housing of cattle under the family roof.

5. When necessity arises the Deputy Sanitary Commissioner will be required to investigate the circumstances and record the facts in regard to undue prevalence of any disease occurring within the limits of his circle. And for such investigation and record the aid of the subordinate dispensary establishment may be made available if it do not interfere with their proper work.

6. Each Deputy Sanitary Commissioner will prepare and submit to the Sanitary Commissioner, an annual sanitary report referring to the portion of the Province included within his circle, under the following heads or sections:—

- I.—Vital statistics: progress and improvements.
- II.—Chief diseases: general history.
- III.—Vaccination: general history.
- IV.—Sanitary works: civil.
- V.—General remarks, including record of inspections.

7. The Deputy Sanitary Commissioners will submit their vaccination and other established returns to the Sanitary Commissioner's office at Lahore, and their official reports and correspondence with the higher authorities will be addressed to the Sanitary Commissioner for submission to Government.

8. Deputy Sanitary Commissioners are to impress on all subordinates of the department the necessity of mastering the more important principles of sanitation and hygiene, so as to be able to assist the Deputy Sanitary Commissioners in this part of their work. It will be incumbent on all subordinates, down to and including vaccinators, to qualify in the elementary rules of the above subjects; and preference will be given, as regards pay and promotion, to those who qualify first and prove themselves efficient aids in sanitary works.

9. A Deputy Sanitary Commissioner should invariably notify his intention to visit a district to the Deputy Commissioner, who will order Tahsildárs and other local officers to assist him, and also inform municipal committees of the nature of his duties and direct them to attend upon him when he visits municipal towns.

10. A Deputy Sanitary Commissioner should, if practicable, invariably see the Deputy Commissioner of each district he may visit during his tour and inform him of what he has observed. His visits will be useful in proportion to the degree in which he can interest the local authorities in the subject of sanitation.

II.—Rules for the guidance of Civil Surgeons in the Vaccine and Sanitary Departments.

1. The management of vaccine operations and the control of the vaccination staff within the limits of his district will be an important duty of the Civil Surgeon. He will be responsible for the adequate and continuous supply of vaccine lymph in his district during the vaccinating season, will, as far as is practicable, personally supervise the general operations of the vaccinators, examine their registers and verify the record of results.

2. The Civil Surgeon will use every reasonable endeavour to extend the practice of vaccination equally throughout his district, and will explain the origin, history and advantages of vaccination to the people amongst whom he works, especially to village headmen and natives of position and influence. He should, as often as convenient, vaccinate the children of such persons with his own hands, so as to ensure good results. And on the occurrence of small-pox in any part of his district, the Civil Surgeon will at once take steps to check its spread and to afford protection to the unprotected by vaccination. He should be on the look-out for the occurrence of such cases, and on the first appearance of the disease at once combat its spread by the aid of his vaccinators.

3. The improvement of birth and death registration of both urban and rural circles in his district will be an important duty of the Civil Surgeon. And with that end in view he will examine the village chaukidárs' memorandum books of births and deaths and verify the entries by investigation on the spot. He will also examine the birth and death registers and returns kept at the police and municipal offices of his district as often as possible; he will note the condition of the registers and returns, the correctness or otherwise of the entries and total additions, and the probable amount of attention given to registration; and will record the results of each examination in the police station visitors' book or municipal secretary's minute-book, for the information of the Superintendent of Police or the Municipal Committee, as the case may be.

4. The sanitary inspection of towns and villages in all parts of his district will form an essential portion of the duties of a Civil Surgeon. He will, as far as the nature of his other duties permit, make tours of sanitary inspection and vaccination in all parts of his district. He will at the time of inspection make a record of the circumstances likely to produce disease, and submit a report thereof to the Sanitary Commissioner for transmission to Government, with such recommendations for improvement in the sanitary aspect of the place as may seem advisable. These sanitary inspections must be made by the Civil Surgeon himself, and not by any subordinate officer of the department.

5. The furtherance of measures for the improvement of the sanitary condition of villages in all parts of his district will be an important duty of the Civil Surgeon. He will use his best efforts to persuade villagers to abandon practices which tend to produce unhealthiness, and explain to them the evil consequences of neglected conservancy, of unprotected water-supply, of defective ventilation and faulty domestic hygiene.

6. On the occurrence of any undue sickness or mortality in any part of his district, the Civil Surgeon will at once report the circumstance to the Sanitary Commissioner, with a brief statement of the facts in regard to the undue sickness or mortality, and, if necessary, will himself proceed to the spot and personally investigate the circumstances.

7. Each Civil Surgeon will prepare and submit to the Sanitary Commissioner an annual sanitary report referring to the district in his medical charge, under the following heads or sections:—

- I.—Vital statistics; progress and improvement.
- II.—Chief diseases: general history, with special notice of "fevers."
- III.—Vaccination: progress and improvement.
- IV.—Sanitary works: civil.
- V.—General remarks, including record of inspections.

8. Each Civil Surgeon will submit his vaccination returns to the Deputy Sanitary Commissioner of the circle in which his district is situated, and will address his correspondence in the vaccine department also to that officer.

9. It will be the duty of the Civil Surgeon to instruct the vaccination staff attached to dispensaries in his district in the elementary principles of sanitation and domestic hygiene, so as to qualify them for employment in sanitary work during the now-vaccinating season.

10. Each Civil Surgeon before employing any vaccinator in sanitary work, will invariably first communicate with the Deputy Commissioner and work in consultation with him.

108. These duties it will be seen provide for more frequent inspections and more rigid supervision, Further suggestions for improvement of village conservancy. the two great desiderata, which appear to me to be indispensable to the advancement of the cause of village conservancy.

There is a general consensus of opinion amongst the district authorities, as to the necessity for some re-organized system of work in the matter of village conservancy, and some officers advocate the enforcement of the same by law. Such a means cannot, of course for obvious reasons, be resorted to; at present I would recommend, however, that the entire responsibility for the cleanliness of a village be thrown on the lambardars and that they be empowered to raise, by private subscriptions, or in kind, or by any other means that may be considered most advisable by the civil authorities, a sufficient sum to enable them to maintain a fixed and permanent conservancy establishment of 2 or 3 sweepers, and also to carry out, as far as is practicable, the suggestions that may be made to them during the inspection of the Civil Surgeon, and I would further suggest with a view to excite emulation amongst them, that the services of those who have rendered assistance to Medical officers and evinced interest in the cause of sanitation, be rewarded by the grant of a recommendatory letter or *khillat* by Government, which should be forwarded to the district authorities through this office.

List of towns and villages inspected by Deputy Sanitary Commissioners and Civil Surgeons.

109. The following is a list of towns and villages inspected by the Deputy Sanitary Commissioners and Civil Surgeons from 1st April to 31st December 1881 :—

List of towns and villages inspected by the Deputy Sanitary Commissioners and Civil Surgeons from 1st April to 31st December 1881.

District.	Name of officer by whom inspected.	Name of town, village, or rural circle inspected.	Date of inspection.		
Hoshiarpur	Deputy Sanitary Commissioner, Eastern Circle, Surgeon-Major J. Bennett, M. D.	Mukerian	T.	December	19th
		Dussuah	T.	Do.	21st
Gurdaspur	Ditto, ditto	Dera Nanak	T.	November	28th and 29th
		Kalanaur	T.	Do.	30th
Siālkot	Ditto, ditto	Siālkot	T.	Do.	20th
Rawalpindi	Deputy Sanitary Commissioner, Western Circle, Surgeon J. O'Neill	Hussan Abdal	T.	November	18th
Gurgaon	Officiating Civil Surgeon, Gokal Chand	Nuh	T.	December	30th
		Ghasera	V.	Do.	31st
Sirsa	Officiating Civil Surgeon, Sodhi Fatteh Singh	Sirsa	T.	April	5th, 6th and 7th
		Sahuwala	V.	November	3rd
		Pipli	V.	Do.	4th
		Dalwali	V.	Do.	5th
		Lambi	V.	Do.	7th
		Malout	V.	Do.	8th
		Arniwala	V.	Do.	9th
		Fazilka	T.	Do.	12th
		Salim Shah	V.	Do.	15th
		Muzzum	V.	Do.	"
		Hasta	V.	Do.	"
		Bahak	V.	Do.	16th
		Ladhuka	V.	Do.	"
		Ranawattu	V.	Do.	"
		Alam Shah	V.	Do.	17th
		Muhammad Pira	V.	Do.	"
Jhangar	V.	Do.	18th		
Pakka or Gung Baksh	V.	Do.	"		
Beguwala	V.	Do.	19th		
Shajrana	V.	Do.	"		
Balluwana	V.	Do.	24th		
Qabarwala	V.	Do.	"		
Abohar	V.	Do.	25th		
Khanya Khera	V.	Do.	"		

List of towns and villages.—(continued).

District.	Name of officer by whom inspected.	Name of town, village, or rural circle inspected.	Date of inspection.			
Umballa	Civil Surgeon, Surgeon-Major G. Thomson, M. E.	Shahabad	T.	December ... 8th		
Jullundur	Surgeon-Major J. C. Penny, M. D.	Bangah	T.	April ... 4th		
		Phillour	T.	Do. ... 9th		
Amritsar	Surgeon-Major G. C. Ross	Tarn Taran	T.	April ... 17th		
Gujránwala	Civil Surgeon, Honorary Surgeon R. J. Quinnell, M. D.	Pope Naka	V.	Do. ... 2nd and 23rd		
		Kamoki	V.	Do. ... 29th		
		Moralliwal	V.	Do. ... "		
		Ghakhar	V.	May ... 4th		
		Eminabad	T.	Do. ... 12th		
		Ramnaggar	T.	Do. ... 19th		
		Gagiwali	V.	October ... 6th		
		Butranwala	V.	Do. ... "		
		Talwandi Rahwali	V.	Do. ... 8th		
		Lohianwala	V.	Do. ... "		
		Ferozwala	V.	Do. ... 13th		
		Sansara	V.	Do. ... 20th		
		Botalla Sharm Singh	V.	Do. ... "		
		Magul Chack	V.	Do. ... 28th		
		Man	V.	Do. ... "		
		Kot Bhawani Dás	V.	Do. ... 31st		
		Pope Naka	V.	Do. ... "		
		Buddoki	V.	November ... 8th		
		Bucha Chutta	V.	Do. ... 15th		
				Thikari	V.	April ... 9th
				Kulawala	V.	Do. ... "
				Lalamusa	V.	Do. ... "
				Jhudawala	V.	Do. ... 10th
				Kharian	V.	Do. ... "
				Serai Naurangabad	V.	Do. ... 12th
				Khokhar	T.	Do. ... "
				Sadulapur	V.	Do. ... 21st
		Phalian	V.	Do. ... 22nd		
		Qaudrabad	V.	Do. ... 23rd		
		Kunjah	T.	Do. ... 24th		
		Mangowal	V.	Do. ... "		
		Jalalpur	T.	May ... 11th		
		Karianwala	V.	Do. ... 12th		
		Kotla	V.	Do. ... 17th		
		Dulawala	V.	Do. ... 26th		
		Dingah	T.	Do. ... 27th		
		Mung	V.	Do. ... 28th		
		Matawala	V.	Do. ... 29th		
		Kharian	V.	September ... 28th		
		Khohar	V.	Do. ... 29th		
Gujrat	Civil Surgeon, Surgeon-Major J. R. Deane	Jalalpur	T.	October ... 22nd		
		Karianwala	V.	Do. ... 23rd		
		Daulatanagar	V.	Do. ... 28th		
		Kotla	V.	Do. ... 29th		
		Chachi	V.	November ... 10th		
		Dingah	T.	Do. ... 11th		
		Mung	V.	Do. ... 12th		
		Dulawala	V.	Do. ... 13th		
		Matawala	V.	Do. ... "		
		Saroki	V.	December ... 3rd		
		Kothala	V.	Do. ... 5th		
		Sadulapur	V.	Do. ... 9th		
		Phalian	V.	Do. ... 10th		
		Sirsa	V.	Do. ... 11th		
		Qaudrabad	V.	Do. ... "		
		Mangat	V.	Do. ... 12th		
		Dhoul	V.	Do. ... "		
		Mangowal	V.	Do. ... 14th		
		Chakmano	V.	Do. ... "		
		Kunjah	T.	Do. ... "		
		Khohar	V.	Do. ... 19th		
Lalamusa	V.	Do. ... "				
Kharian	V.	Do. ... "				
Shahpur	Civil Surgeon, Surgeon G. F. Nicholson	Bhera	T.	December ... 8th		
		Girot	T.	Do. ... 14th		
		Núrpúr	V.	Do. ... 16th		
Mooltan	Civil Surgeon, Surgeon-Major R. Gray, M. E.	Shujabad	T.	November ... 18th		

List of towns and villages.—(concluded).

District.	Name of officer by whom inspected.	Name of town, village, or rural circle inspected.	Date of inspection.
Jhang	Officiating Civil Surgeon, Bahadur Chetan Shah	Ahmedpur ...	T. April ... 1st
		Hassan Balil ...	V. Do. ... 4th
		Nadha Ghar ...	V. June ... 8th
		Lan ...	V. Do. ... 10th
		Kot Isá Shah ...	V. Do. ... 9th
		Shorkot ...	T. July ... 5th
		Jallalpur Kawláná ...	V. Do. ... 7th
		Haweli Bahadur Shah ...	V. Do. ... 9th
		Chanot ...	T. August ... 11th
		Kot Isá Shah ...	V. September ... 8th
		Vasu and Astana ...	V. October ... 14th
		Nekokara ...	V. Do. ... 16th
		Shorkot ...	T. Do. ... 20th
		Ahmedpur ...	T. Do. ... 18th
		Kot Isá Shah ...	V. December ... 3rd
		Mari Shah Sakhira ...	V. Do. ... 5th
		Machhiwál ...	V. Do. ... 7th
		Mirak ...	V. Do. ... 22nd
		Shorkot ...	T. Do. ... 24th
		Dab Kalán ...	V. Do. ... 25th
		Ahmedpur ...	T. Do. ... 27th
		Garh Maharaja ...	V. Do. ... 29th

NOTE.—T. denotes town, and V. village.

Altogether 30 towns and 188 villages were inspected during the nine months of the current year. A summary of the more important of these is herewith given.

Action taken by Municipal and District Committees on the suggestions made in the following Inspection Reports printed in the Sanitary Report for the year 1880.

SRIGOVINDPUR TOWN (GURDASPUR DISTRICT.)

See list at page 77.

- (a). *Bad sanitation.*—“The Committee have since made considerable progress in improving the sanitary condition of the town.”
- (b). *Latrines and godowns for storage of filth.*—“Could not be built for want of funds, but the matter will receive consideration whenever funds are available.”
- (c). *Drainage of Dháb near the town.*—“A kacha drain has been built to carry the water into the Dháb.”
- (d). *Drains.*—“Are now properly cleaned and washed.”
- (e). *Protection to wells from contamination from broken drains.*—“Nothing has been done yet for want of funds.”

BATALA TOWN (GURDASPUR DISTRICT.)

See list at page 77.

- (a). *Tank for flushing drains.*—“The Committee have arranged to build a tank for flushing the drains, and also to buy a well which will supply the former with water.”
- (b). *Deposits of filth on road sides by contractors.*—“Twelve enclosures will be built next year for deposit of filth. For this work a provision of Rs. 1,200 has been made in the Budget for 1882-83.”
- (c). *Street drains much too close to wells.*—“An estimate for construction of new drains which will run at a distance from the wells is under preparation, and the work will be undertaken as soon as possible.”
- (d). *Drains at sweetmeat sellers' shops especially very filthy.*—“Arrangements have been made to keep the drains under shops, where eatable articles are kept for sale, as clean as possible.”

(e). *Latrines very filthy and dry-earth system not carried out.*—"Orders have been issued to the conservancy darogah to introduce the dry-earth system at once."

(f). *Slaughter-house.*—"The repairs of the platform and drains have already been taken in hand."

(g). *Washing clothes in the Anárkalí tank.*—"As there is no other place where clothes can be washed, there is no way of getting out of the difficulty at present."

(h). *Drain discharging filthy and foul-smelling water into the Anárkalí tank.*—"Arrangements are being made to stop filthy water running into the tank."

(i). *Circular drain round the town to convey water away and not into the dhábs round the town.*—"A project for a circular drain round the town is under the consideration of the Committee."

BAHRAMPUR TOWN (GURDASPUR DISTRICT.)

See list at page 77.

(a). *Conservancy.*—"A Muhammadan chaprassi and two sweepers have been added to the present staff; it is hoped that there will be an improvement in the conservancy arrangements of the town."

(b). *Manure godowns.*—"Site for 'gobar' or manure godowns have been approved of by my predecessor. District fund 'beldárs' have been ordered to dig trenches round them, as the Municipal Committee have no money to build any sort of walls."

(c). *Latrines.*—"Latrines cannot be provided for want of funds."

(d). *Slaughter-houses.*—"The two beef slaughter-houses are those at Bahrampur and Raipur: the one at the latter place has nothing to do with Bahrampur, this place was filthy when my predecessor inspected it. Orders will be issued to keep it clean, otherwise the owner will be prosecuted for public nuisance. The slaughter-house at Bahrampur was clean inside when inspected by my predecessor, but the thicket of reeds and palm trees which surrounded it was full of bones, &c. The Tahsildár has been ordered to cut down the reeds and to keep the place clean. The Committee have no funds to make any pukka drains. The District fund 'beldárs' have been ordered to do what they could to improve the present kacha drains."

DINANAGAR TOWN (GURDASPUR DISTRICT.)

See list at page 77.

(a). *Site for vegetable sellers.*—"The Municipal Committee have been instructed to select a site for vegetable sellers, and it is hoped that the suggestion will be carried into effect at a very early date."

(b). *Latrines.*—"A latrine for women will be built at each of the two gates, and then a policeman will be posted to prevent nuisances being committed in its neighbourhood. A plan for a circular road round the town is under preparation."

(c). *Slaughter-house.*—"The present slaughter house is 300 yards from the town walls, and is not therefore within Municipal limits. When my predecessor inspected the place it was not free from smell, and he ordered the owner to put down fresh or dry earth where the cattle are slaughtered, that is, to remove the top layer and put down a new one. It is, however, in contemplation to extend the Municipal limits so as to include it, when it is hoped to enforce the Municipal bye-laws as regards slaughter of cattle. The District Engineer has been directed to submit a proposal for two circular outfall drains."

KALKA TOWN (SIMLA DISTRICT.)

See Appendix C of Report for 1880.

His Honor the Lieutenant-Governor has sanctioned the following for the improvement of the sanitary condition of the above town, *vide* Punjab Government No. 277, dated 4th February 1882, to Commissioner and Superintendent, Umballa Division :—

(a). *Latrines.*—"The construction of three new latrines the cost of which is to be met from the balance in hand of the Kalka fund. A reference should be made to the Accountant-General to ascertain what, if any, balance of this fund exists."

(b). *Third class dispensary.*—"The establishment, as an experimental measure, of a third class dispensary at an estimated cost of Rs. 840 per annum, one-half of which is to be contributed voluntarily by the residents of Kalka."

(c). *Conservancy establishment.*—“The following revised scale of chaukidárs and conservancy establishment :—

1 Naib-Dároga	@	Rs. 15	per mensem	...	...	...	Rs. 180
8 Sweepers	@	5	each	...	...	...	480
8 Do.	@	4	"	...	...	...	384
3 Chaukidárs	@	5	"	...	...	...	180
3 Do.	@	4	"	...	...	...	144
Contingencies				...	...	...	72

Total Rs. ... 1,440

(d). *Act XX of 1856.*—“The extension of Act XX of 1856, to Kalka with a view to funds being raised to meet the charges now sanctioned; the amount so raised being added to the Kalka fund.”

(e). *Miscellaneous.*—“The assignment of the net receipts from encamping grounds in Kalka to the Kalka fund. Your proposals for improving the water-supply of the town are also approved.”

The extension of Act XX of 1856, to Kalka will be duly notified in the “Punjab Gazette.”

SIALKOT TOWN.

See Sanitary Report for 1880, page 91.

The Deputy Commissioner is adopting measures to carry out the suggestions made “for the improvement of the above town by the Sanitary Commissioner.”

FATEHGARH TOWN (GURDASPUR DISTRICT.)

See Sanitary Report for 1880, page 116.

(a). *Drainage.*—“The mistri has been ordered to prepare a comprehensive plan for the drainage of the town.”

(b). *Fort ditch.*—“The owner of the fort declines to fill in the ditch, the report of the Committee with plan is under consideration of the President.”

(c). *Leather bottles manufactory.*—“This manufactory should be removed outside the town. A Sub-Committee has been appointed for selecting a site for the purpose.”

(d). *Wells.*—“They will be cleared out as soon as funds are available.”

(e). *Manure godowns.*—“The formation of manure godowns is under consideration and the suggestion will be acted upon.”

(f). *Conservancy establishment.*—“To give effect to proper sanitary arrangements the conservancy establishment will be supplemented by additional hands.”

(g). *Holes or chappars and tanks.*—“Holes or chappars will be drained and cultivated as soon as funds are available. The supplying of the tank with the water from these chappars will be prohibited, and will, in future, be fed from the canal.”

KALANAUR TOWN (GURDASPUR DISTRICT.)

See Sanitary Report for 1880, page 118.

(a). *Paving of roads.*—“The repairs will be executed as soon as funds are available.”

(b). *Drains.*—“As the drains are not on a level with the surface, water cannot smoothly run in them. These will be renewed, when funds will admit of their being done. Necessary repairs will be executed when funds are available to the drains near wells.”

(c). *Public latrines.*—“Will be attended to when funds are available.”

(d). *Street refuse.*—“Orders have been issued to deposit the street refuse at a great distance from the town.”

(e). *Slaughter-house.*—“The slaughter-house is not within the beat of the municipality; traders in hides put up there with butchers.”

(f). *Tank.*—“A flushing tank will be built as soon as funds are available; people have been instructed to get their drinking water from wells up the Kiru.”

EMINABAD TOWN (GUJRANWALA DISTRICT.)

See Sanitary Report for 1880, page 120.

(a). "The Municipal Committee have agreed to close the Muhammadan burial ground, portion of which is inside the circular road, as suggested by Dr. Bellew."

(b). "The Committee have issued notices to all the owners whose houses are in ruins to re-build or remove the same within a certain period, and to pull down and level the ruins of arches and walls along some of the streets, to allow free circulation of air."

(c). Dr. Bellew remarks that the conservancy establishment is insufficient and recommends that the establishment be increased. "The Committee have carried out this recommendation to improve the conservancy arrangements, two extra sweepers and two bhishtis having been appointed for the purpose."

(d). "For the purposes of conservancy, the town has been divided into wards and each member has been made responsible for having his ward kept clean."

(e). "With reference to Dr. Bellew's suggestion for deriving income from utilization of town sweepings and refuse, the Committee have resolved to assert its right to remove town sweepings. Four convenient sites have been appointed at different places for the storage of manure, and its sale from there. The Municipal and other sweepers have been ordered to carry all sweepings and refuse to the appointed sites."

(f). "The Committee have prohibited the burning of dead bodies elsewhere than at the selected places, as Sanitary Commissioner remarked that some bodies were carried away to wells, &c., and in accordance with his suggestion the number of burial places for Muhammadans has been reduced to four."

(g). "The Municipal Committee have ordered estimates; (1) for repairing pavements in streets, which are urgently in need of repair; (2) for making water-coarces to the two sarái wells; and (3) for repairing latrines, and the members will see in future that they are kept clean."

BOTALA VILLAGE (GUJRANWALA DISTRICT.)

See list at page 77 of Sanitary Report for 1880.

(a). "A translation of the Sanitary Commissioner's remarks will be communicated to Sirdar Jhanda Singh and his son, who are Honorary Magistrates and reside in the village of Botala, and they will be asked to help in improving the sanitary condition of the village."

JALALPUR TOWN (GUJRAT DISTRICT.)

See Sanitary Report for 1880, page 120.

(a). "The necessary steps have been taken by the Municipal Committee of the town to carry out the suggestions of the Civil Surgeon and the Sanitary Commissioner, Punjab."

DINGAH TOWN (GUJRAT DISTRICT.)

See Sanitary Report for 1880, page 122.

(a). "The storage places of sweepings to be walled in. The Native Doctor, Mir Hyder has the details."

(b). "Three katcha tanks to be reserved for the people to bathe in. This water not to be drunk by them; and all animals to be excluded from these, which should be protected by low walls or by a hedge. All the other chappars and pools of water to be kept for cattle, no human beings to enter there."

(c). "There is only one female sweeper for two latrines; one more is required."

(d). "A cell for the storage of dry earth should be built near each latrine, the cell to be vaulted not flat roofed to keep out leakage, seats with earthen vessels to be provided for the latrines."

(e). "The latrine sewage which is now buried in trenches should be sold to increase the income for conservancy purposes: baskets and shovels for sweepers, &c."

(f). "The slaughter place should be enclosed by a low wall."

(g). "The wells in the town should be cleared out during the year; one or two each month."

(h). "The Sanitary primers should be distributed by members to zaildárs and lambardárs for the education and communication of contents to the people."

(i). "One or two bhishtis should be entertained to flush drains in dry weather, and to sprinkle the Bázárs street."

MANGOWAL VILLAGE (GUJRAT DISTRICT.)

See Sanitary Report for 1880, page 121.

(a). "Orders have been issued to the Tahsildár to have the suggestions of the Sanitary Commissioner carried out as far as possible."

MATAWALA, CHAK VASAWA, SAHIDWALI, DULAWALA, CHACHI AND MUNG VILLAGES (GUJRAT DISTRICT).

See list at page 77.

(a) "Orders have been issued for the suggestions of the Sanitary Commissioner being carried out as far as possible."

AHMADPUR TOWN AND SHORKOT VILLAGE (JHANG DISTRICT.)

See Sanitary Report for 1880, page 122 and list at page 77.

(a) "Commendatory parwanahs have been given to Makhdum Jalal, and his agent Radha Ram, as directed, and a report will be submitted, when further action is taken with reference to the remarks of the Sanitary Commissioner."

ATHARA HAZARI VILLAGE (JHANG DISTRICT.)

See list at page 76.

(a) "The public saráis are now quite clean and there is no fault in their conservancy."

(b) "Lambardárs have established a manure godown at a distance of 200 *Karams* from the village and the manure collected in the village has been carried away to that place."

MUZAFFARGARH TOWN (MUZAFFARGARH DISTRICT.)

See Sanitary Report for 1880, page 102.

(a) "Proposed by the Secretary that godowns, 40 feet square, with enclosure walls 3 feet high, be formed for the collection of all filth, refuse, and rubbish of every description. Resolved that 4 godowns be formed outside the town at a distance of 600 feet from the town walls, one at each of the four wells Begwala, Okhanwala, Bukhariwala, and Mitawala. The native members should first select and mark the sites, and after approval by the President and the Civil Surgeon of the station, the godowns should be erected. Mistri to prepare an estimate for making the enclosure walls. Each godown should be divided into two portions by a partition wall one foot high. Filth should be collected in one portion for one month, and in the other during the succeeding month, and so on, and should be sold for cash after it has been kept for one month. It should be sold at the following rates:—

					Rs.	A.	P.
100 donkey loads	...	...	...	...	1	0	0
40 Bullock "	...	...	...	...	1	0	0

Application for the purchase of filth from the godown at Begwala well, should be made to Lakhu Ram, from the godown at Okhanwala well to Javinda Ram, from the godown at Bukhariwala well to Thakar Mal, from the godown at Mitawala well to Ditta Ram, and the members aforesaid should see it supplied to applicants through the servants of the Committee."

(b). "Proposed by the Secretary that the contract of sale of town sweepings be cancelled and kept *Amáni*.

Resolved that as the sweepers have no objection to the contract being cancelled, the contract be cancelled from the 1st January 1881, and the filth be collected in godowns. As the sweepers in the employ of the municipality are the contractors of the sweepings, they keep their donkeys for carrying filth outside the town. But as the contract is to be cancelled they are no longer bound to remove the filth to the godowns. Resolved that an increment of Re. 1 be given to each of the 13 sweepers now receiving Rs. 4 per month for keeping a donkey each and taking the filth to the godowns."

(c). "Proposed that the sinks at the Southern gate be filled up and the drains levelled from the gate, so as to discharge into the circular drain.

Resolved that estimates be prepared by the mistri for the above and after sanction of the estimates the works be carried out."

(d). "Proposed that the low places, in the roads where water stands after rain, be raised by filling earth, or if possible by making the road pukka. Resolved that estimates be prepared by the mistri, (1) for filling in low places in the road, and (2) for making the road around the town pukka."

(e). "Proposed that pavements be made "mahipusht" (convex) instead of concave. Resolved that this plan holds good for wide streets; but it cannot be adopted for narrow lanes, as in having them 'mahipusht' drains will have to be provided on both sides, and therefore the path will become too narrow."

(f). "Proposed that the refuse from stables and other places where cattle stand should be removed by the owners or by the conservancy establishment.

Resolved that a proclamation be made in the town, that such refuse, if not removed by the owners within two days, will be removed by the conservancy establishment to the godowns."

(g). "The number of deaths registered in the Register of births and deaths is more than that of births. The experience of the world shows that population is increasing not decreasing. It is clear that the births are not registered. Resolved that the members be asked to pay attention to these registers and to exercise careful supervision. The registers should be attested by the members weekly and offenders against the bye-laws regarding the registration of births and deaths should be chaledan duly."

(h). "The members pay little or no attention to the bye-laws in force in this Municipality scarcely any offender is ever chaledan. Resolved, that the attention of the members be invited to this. Rangu Ram, Moharrir of Registration of births and deaths who is particularly responsible for the conservancy of the town, be directed to send a written report of any act or omission against the bye-laws, to the member within whose charge the act or omission occurs, and be held responsible for due compliance, with this direction the member should chalan the case if he finds sufficient reason for doing so."

(i). Resolved that the above proposals be submitted to the President for confirmation.

All the proposals are confirmed with the following amendments:—

- (1). There is no necessity of fixing any particular price. The highest offer should be accepted.
- (2). There is no necessity that purchasers should apply to any particular member for manure, application should be made to the Secretary. The godowns should be formed at once.

KOHAT TOWN (KOHAT DISTRICT).

See Sanitary Report for 1880, page 125.

(a). "The drainage scheme will be first submitted for the approval of the Sanitary Commissioner as desired."

Summary of Inspection Reports inspected by the Deputy Sanitary Commissioners of the Eastern and Western Circles, Punjab.

(BY DEPUTY SANITARY COMMISSIONER, EASTERN CIRCLE.)

SIALKOT.

Inspected on the 20th November 1881.

The sanitary defects as described in the Sanitary Commissioner's Inspection Report of 21st and 22nd March 1881 remain unchanged, no attempt at carrying out the improvements therein proposed, having yet been made.

Streets and drains.
From wells, 222 inside and 15 outside the town. The depth of the wells inside the town is a little over 62 feet, the distance between the water-level and the mouth of the well being about 58 feet; in a well outside the town, in almost constant use for purposes of irrigation, the water-level was 46' 10" from the surface, the depth of the water being 3' 5". Samples of water from three different wells were qualitatively analyzed, with the following results:—water taken from the irrigating well just referred to which is situated about 300 yards from the out skirts of the town, shewed the presence of chlorides and sulphates in very minute quantity, there being no nitrates or ammonia, while in a sample taken from a well inside the town, in mohalla Babrián, the water of which was highly spoken of by the natives as being pure and sweet and much used by Hindús, was found to contain sewage salts in great abundance, chlorides and nitrates, with ammonia in smaller amount. The co-incident presence of nitrates and ammonia points to sewage pollution both old and recent. In another well close to mohalla Tibba Khayián, but outside the town, not a trace of sewage contamination could be found.

Water-supply.
There are 17 latrines, 10 for females and 7 for males. They consist of a row of compartments for males on the outside of a high wall, which, as a rule, encloses a large space intended for women. A latrine visited was found to be clean but the floor being kacha, and there being no utensils to catch the liquid excreta, the soil, although apparently clean on the surface, omitted the ammoniacal odour of decomposing urine on being dug up. The dry earth system was not being efficiently carried out; there was no dry earth in store; the godown intended for storing it being used as a sleeping apartment by the sweepers in charge. Close to the latrine a deep hole from which earth, as required, was dug up, and used without previous preparation of any kind. It is highly desirable dry earth be prepared in the usual way and stored. The privy soil is leased for Rs. 96.

Remarks by Sanitary Commissioner. Recommends that the attention of the Municipal authorities be invited to the remarks of the Deputy Sanitary Commissioner, under the head "Chief sanitary defects."

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

- (a). The pavement of the main streets has been repaired since the visit of the Sanitary and Deputy Sanitary Commissioners. The drains have been put in order. The Committee have provided Rs. 2,000 in the ensuing year's Budget for the circular drain recommended to be constructed by the Sanitary Commissioner. This is a work of some magnitude and it will take time to complete it, as the Committee cannot afford to allot more than two or three thousand per annum for it. It will cost at least Rs. 15,000. Some difficulty has been experienced in getting a correct plan and estimate prepared; the assistance of the Department Public Works is required, and the matter has formed the subject of a separate reference to the Commissioner. The Committee would be glad if the Department Public Works could undertake the work, and are prepared to pay for supervision up to 25 per cent. of the prime cost, (*vide* Deputy Commissioner's No. 178, dated 16th November 1881, to Commissioner and Superintendent).
- (b). Sites have been selected for seven manure godowns, two of these godowns have already been built, one in Mainapura and the other outside the Mori gate. Both of them are pukka enclosures.
- (c). The cylinders and platforms of 10 of the wells in the city have been repaired thoroughly, the embankment round these wells has been made to slope outwards so as to prevent waste water running back into the wells. A waste water gutter leading to the nearest street drain has been provided for each of these wells.
- (d). The Committee will take the matter of increasing the conservancy staff as soon as the manure godowns are ready.
- (e). The latrines have been repaired. The Sanitary Commissioner's suggestions about having covered latrines and providing them with proper ventilation will be borne in mind and will be carried out, should any more latrines be required. Glazed receptacles (or gamlahs) will be provided in all the latrines.
- (f). The plan and estimate of the slaughter-houses at Delhi, which has been recommended by the Sanitary Commissioner as a model, have been repeatedly called for; as soon as they are received measures will be taken to construct them here on the same style.
- (g). As funds became available the Committee intended to enclose grave yards and cremation grounds with walls.

DERA NANAK TOWN (GURDASPUR DISTRICT.)

Inspected on the 28th and 29th November 1881.

Dera Nának is an open town of an irregularly oblong form, situated near the left bank of the Ravi, about two miles from the present bed of the river. During the rains and when the floods are very heavy, the river spreads out over its old bed, and reaches its former bank on which the town is built. Until four years ago the river ran close to the walls, and having for several years been gradually eating more and more into the left bank, threatened the destruction of the town, a protective embankment had to be constructed two miles further up, which deflected the course of the stream into its present channel.

Only two of the main streets are paved and drained, the surfaces being well convexed with good serviceable drains on either side, with the exception of two or three other streets of small dimensions; the rest of the town is unpaved and undrained. A long street running East and West through the length of the town, is always in an extremely dirty state; every year during the rains the sewage and surface water of a fourth part of the town pours into this street throughout three-fourths of its length, where it is about two and a half feet below the general level, the water in many places being about two feet deep. It is very desirable that this low lying portion be raised, paved and drained. Owing to the very defective state of the surface drainage, the ground on the outskirts to the North and West during a great part of the rainy season is inundated, the water draining away slowly over the fields towards the Naomani Nuddi, which flows past about a mile to the South. An efficient system of surface drainage is particularly required at this point, and if sufficient funds are available, should be carried out with as little delay as possible. A large kacha drain made between the Mulk Raj gate, where the Batála road begins and the Naomani Nuddi, would probably meet the requirements of the case.

There is no regular system of sewerage or surface drainage, the gutters and drains discharging their contents in the most irregular manner into holes and depressions in the ground both inside and outside the town, there to stagnate until carried away by the monsoon rains. The conservancy arrangements are somewhat deficient, and the

removal of filth appears to be very irregularly carried out. The sweepings are sold to a contractor for Rs. 650 a year, being an increase of Rs. 288 over that for previous year; with better management and more care taken in collecting the sweepings in places set apart for the purpose on the outskirts, this source of revenue could with ease be considerably increased.

From wells. There are 92 wells all of which are inside the town. The average depth of three wells measured was from the surface of the ground to the water level 16' 11", and the average depth of the water was 5' 6". The analysis of samples of water taken from these showed an absence of chlorides and nitrates, but in one ammonia was found present in large quantity, and in smaller quantity in another specimen, sulphates to a small extent were found in all three. On the other hand, in a shallow well into which water filtered from an adjacent tank, chlorides and sulphates were found in great abundance. Here the soil and subsoil to a depth of three or four feet was impregnated with réh salts, and having small nodular masses of kankar interspersed through it, and to this no doubt the salinity of the water in the well is due.

Water-supply. Latrines. There are no latrines. People go to the fields and the old bed of the Ravi.

Cremation and burial grounds. One cremation ground about half a mile above the town, near the bank of the river. During the rains it is frequently under water. Two burial grounds, one situated at a distance of half a mile from the town towards the West, and the other about a mile to the South of the town on the Amritsar road. Both are open spaces; little or no care appears to be taken of the one inspected.

Remarks by Sanitary Commissioner. Recommends that the Municipal authorities be asked to consider the practicability of constructing serviceable surface drains to carry off the flood waters of this town, as suggested by the Deputy Sanitary Commissioner, and that better arrangements be made for the scavenging of the town, and disposal of filth and sweepings.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

(a). A plan and estimate is being prepared by the Municipal Committee for raising the low-lying portions of the road and constructing proper drains.

(b). In estimate, with Committee's proceedings, has been submitted for a large katcha drain: it is under Deputy Commissioner's consideration.

(c). The Members of the Committee have been made responsible for proper conservancy arrangements, and the sweepings, &c., of the town have been ordered to be collected on the outskirts in places set apart for the purpose.

(d). The Committee have proposed to build a wall round the burial grounds.

(e). Estimates are being prepared for the purpose of draining the inundated tract of ground inside the town and its vicinity.

KALANAUR TOWN (GURDASPUR DISTRICT).

Inspected on the 30th November 1881.

liminary remarks. Kalánaur, is a walled town of no great size, situated near the left bank of the "Kirin Nuddi," about 15 miles distant from Gurdáspur on the road leading to the Siálkot district, *via* Dera Nának, built on the ruins of a former town said to be of great antiquity; its site is a good deal raised above the plain, rising in the centre to an eminence, on which are the remains of an old fort, and from which a fairly extensive view of the surrounding country is obtained. The outskirts are fairly well wooded on three sides, and cultivation is carried on to within a short distance of the walls of the town. To the North and East of the town, at about 300 yards distance, runs the "Kirin Nuddi," and ponds of considerable size are situated near the walls on the North, North-east, and South. When the floods come down during the rains, inundations from the "Kirin" into which these ponds are drained, take place, and surrounding the walls on almost all sides, to the North and West presenting a sheet of water varying from a mile and a half to two miles in breadth, give the town the appearance of being situated on an island.

Streets and drains. In the bázárs the streets are paved in the usual way, sloping from the centre to shallow side drains on either side. The streets were fairly clean, but out of repair in several places; the drains were unevenly laid and leaky, allowing of percolation into the soil of sewage water, which in many parts was seen to be stagnant. The side streets and alleys were for the most part found to be ill kept, and the house drains, as a rule, were in a filthy condition; the roadways were paved, but with irregular surfaces, and sloping towards a very shallow drain in the centre. In the highest point of the city is a well from which almost the whole of the drains throughout the town could be flushed with little or no difficulty, and at no great expenditure of money.

The gutters and drain discharge their contents all round the skirts of the town, some into ponds and jhils, others into hollows on the surface of the ground, to be washed away during the rainy season, into the "Kirin Nuddi." One large bazar drain issuing from the town at the Lahori gate, ends in a cut in the ground about 80 yards from the town, its contents finally finding their way into the stream just mentioned. The sweepings and house refuse are removed by the municipal sweepers once a day to places set aside for the purpose in the out skirts of the town, whence the filth is taken away by a contractor and used for burning bricks. None of the sites are enclosed, and the sweepings are left for an indefinite time, to be blown about by the wind. The contractor should be made to remove the filth daily, and the sites should be enclosed. The sum realized from this source came to Rs. 220 in 1880-81, against Rs. 280 during current year.

There are 72 wells inside the walls of the town from which drinking water is obtained. The depth of six wells measured varied from 55 feet 6 inches on the highest point in the middle of the town, to 17 feet 2 inches on the outskirts, the respective depths from the surface of the ground to the surface of the water being 47 feet 8 inches, and 5 feet 6 inches, showing a rise of about 42 feet from the circumference of the town to its centre. Specimens of water taken from three wells inside the town were analysed, and the results compared with those obtained from the analysis of water taken from two wells outside. In all, the water was clear and sparkling without taste or smell, in the former the tests for chlorides gave a dense precipitate, and that for sulphates a considerable precipitate, while in the latter samples the indication of the presence of these salts was very slight; the chlorides therefore, in the wells situated inside the town, were probably derived from sewage at a comparatively remote period. In a well used for irrigation purposes, situated in a field near the sewage drain before alluded to, chloride precipitate was not only very dense, but was also of a blackish colour, showing the presence of sulphuretted hydrogen, and ammonia, also, was found in large quantity. Here is a notable example of the dangerous extent, to which a well unprotected by a parapet may become contaminated by the overflow of water mixed with sewage into it during the monsoon rains.

Latrines. There are no latrines. People go to the fields.

There are three cremation grounds. Open spaces to 300 and 400 yards distance from the town. There are twelve burial grounds, only one of which is enclosed. Three large ones are at some distance from the town, the others are in the suburbs. It would be advisable to curtail the number, and the areas of all should be enclosed.

Remarks by Sanitary Commissioner. Recommends that the Municipal Committee be invited to hold a special meeting with the view to giving practical effect to the Deputy Sanitary Commissioner's recommendations. Arrangements for the proper drainage and conservancy of the town should be made as early as practicable, as also, the improvement of the town wells. Each well should be provided with a parapet and waste water conduit of masonry. The cremation grounds should be enclosed. Requests that a report may be forwarded to this office as soon as the improvements mentioned have been taken in hand.

MOKERIAN TOWN (HOSHIARPUR DISTRICT.)

Inspected on the 19th December 1881.

Preliminary remarks. This town is situated on an almost level plain, on the road leading to the Nowshera ferry on the Beas river, which is about 11 miles distant. On three sides it is surrounded by cultivated fields and gardens, with large ponds, into which the sewage of the town is discharged, here and there intervening; and on its Southern skirt lies the village of Tikkowál. The ground slopes somewhat from the centre of the town to its circumference, where the surface is slightly under the general level; but the general direction of the line of drainage is from the North-east to South-west, towards the river.

Streets and drains. The main streets are paved with brick in the usual manner, but on a wrong principal, being concave towards the centre, in which a shallow mid-line gutter runs. The surfaces of the roadways are, in many places, very irregular, and, together with the mid-line gutters, are in a somewhat dilapidated condition; and water mixed with house slops, &c., was seen to be stagnant in the middle of the streets along the course of the drains. Both the main streets and the gullies were for the most part in a dirty unwholesome condition, and no regular system of sweeping seemed to be carried out. It would be advisable to repave the main thoroughfares, on the improved plan, with convex roadways and open saucer shaped drains on either side.

System of sewerage, drainage and conservancy arrangements in force. The combined surface water and sewage of about half the town, conducted by the mid drains along the centres of the streets, collects in a large open main drain built in part of solid masonry, and said to have been constructed about 50 years ago. This drain, passing close to the foundation of Sardár Bur Singh's house, ends in the immediate vicinity outside the wall of the town, in a deep open cut in the ground through which the sewage is discharged into a large pond situated on the outskirts to the South. Throughout the dry season of the year, the drains never being flushed, well and sewage water, mixed with foul and offensive debris in a state of decomposition, is allowed to stagnate in this sewer, which is practically a cesspool until its contents are carried off by the monsoon rains. This mass of stagnant,

decomposing sewage is in dangerous proximity to Sardár Bur Singh's house, to whom the advisability of having it cleaned out, and keeping the drain in a clean wholesome condition was pointed out. The contents of the drains of the Northern half of the town are discharged on the outskirts there to lie in depressions on the surface until scoured into an adjoining pond during the rains. Not unfrequently, during the rainy season, an overflow of water from this pond is said to take place, flooding the Western skirt of the town. Passing near the thánah and school, the flood water finds its way into a small pond at the South-east corner of the town, whence again overflowing and passing over several fields is for the most part discharged into a bathing tank to the South-west. A more efficient system of surface drainage in and around the town is urgently required, deep cuts in the ground, laid out in the line of drainage could be made at but little expense, whereby a considerable portion of the overflow water from the ponds would be carried off, and the extent of inundation said to take place every monsoon season diminished.

The sweepings of the town are sold to a contractor, and burnt on brick kilns, situated at some considerable distance from the town; but not much attention would appear to be paid to conservancy arrangements by the Members of the Municipal Committee.

From twenty-five wells inside, and eight outside, the town. Samples of water were collected from three wells inside the town and analysed qualitatively the following day. Water-supply. In only one were there traces of sewage pollution, in the form of chlorides and sulphates, detected, the other two samples being comparatively free from these salts. A standard sample, with the analysis of which the results obtained from the town water were compared, taken from a well in a garden near the town, showed the underground water in this locality to be unusually pure and wholesome. The average depth of the wells examined was 12' 3", the maximum depth being 16' 3", and the minimum 11' 2".

There are three latrines for females, oblong quadrangular spaces of ground, with simple earthen floor enclosed in walls. The floors of the two inspected by me were seen to be in a very filthy state, being sodden, more or less with urine, and covered with excrement; and immediately outside the walls the ground to a considerable extent presented an appearance similar to that found inside. The filth is contracted for and sold to zamindárs for manure, but no regular system of removal seems to be observed. If these places were properly conserved, and the filth collected in places set apart for the purpose, and sold, the income from this source might be considerably increased. There are no latrines for males. Latrines.

There are four cremation grounds all of which are unenclosed. One is near a pond about half a mile from the town, another is close to the town on the west side, and the third is about 150 yards to the South; all were fairly clean. Cremation and burial grounds.

There are three burial grounds also without walls. It appeared that but little care was taken of the one inspected by me; they are at too great a distance from the town to have an injurious effect on the public health.

An improved system of surface and underground drainage, by drying the soil and lowering the level of the ground water, would no doubt be attended with the most favorable results in improving the general health of the population, and in greatly diminishing the death-rate. Remedial measures to be adopted and other suggestions.

Remarks by Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the faulty state of their street drainage, and to the other sanitary defects pointed out by the Deputy Sanitary Commissioner.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The Deputy Sanitary Commissioner's remarks were translated and explained by the Deputy Commissioner of Hoshiárpur to the Municipal Committee of Mokerian; and suitable orders given to remedy the defects noted, as far as possible, to improve the sanitary condition of the town.

DASUYA TOWN (HOSHIARPUR DISTRICT.)

Inspected on the 21st December 1881.

The main streets are paved, with convex roadways and open side drains, but the side streets are concave with the usual mid-line gutter coated with blackened sewage deposit. In many places the roadways are irregular on the surface with numerous depressions favoring stagnation of water and soakage into the soil. The side drains as a rule, were badly constructed and many of them were seen to be in a dilapidated state, presenting irregularities of channel which greatly retard the flow of sewage. Streets and drains.

The main line of drainage runs from the direction of the old citadel on the North side of the town towards the outlet drain on the South side, with a fall of about 60 feet between these points. The town drainage is, for the most part collected in this drain and emptied into a cutting recently made through the marshy tract lying between the South side of the town and the tahsíl, police station and other System of sewerage, drainage, and conservancy arrangements in force.

Government buildings situated about a quarter of a mile to the South on the edge of what used to be the marsh, but which is now being re-cleaned, and brought under cultivation. The drainage of the West side of the town finds its way into a wide sandy "Nulla" or ravine which bounds Dasuya on the North; on the East side part of the town drainage is discharged on the surface near the outskirts. The drainage outfall is very good, and were the drains and gutters constructed on the modern plan, and kept in a better state of repair, there would be no difficulty in providing for an efficient outlet for the sewage and surface water of the town. In former years, when there was no outlet for the water of the marsh above-mentioned, the greater portion of the land on three sides of the town was under water while in the autumn the soil and subsoil in the low-lying parts of the town, and where the Government offices stand, are said to have become water-logged and unhealthy to a very high degree, the level of the ground water rising to within a few inches of the surface. Since the completion of the main drain about a year ago, the marsh is said to be rapidly drying up, and the excessive humidity of soil of the land adjoining it has thereby been considerably diminished, while at the same time the level of the ground water has subsided to a greater distance from the surface; the result being a very material improvement in the health of the town population. There is still excessive moisture of soil for the lessening of which a more efficient system of surface, combined with under-ground drainage is requisite. This would not only benefit the public health, but would also be useful for agricultural purposes. The construction of drains, such as are ordinarily made in carrying out land drainage, having an outfall into the main drainage channel, could, it is believed, be effected at but comparatively small expense.

The sweepings and house refuse are said to be removed every morning by the municipal sweepers to unenclosed places set apart for the purpose outside the town, whence the filth is removed by a contractor and used as fuel and manure. The amount realized from its sale last year was Rs. 54, being about a third of what might be obtained from this source under better management.

From tube wells, of which 76 are within, and 23 outside Municipal limits. In the former the depth from the surface to the water level varies from 14' 8" in the low lying parts, to 62' 9" in the highest point of the town, the average of five wells measured being 30' 7". In a well close to the Government offices the depth was found to be only 2' 6", the soil and subsoil of the adjoining encamping ground having been found, as has already been mentioned, to be excessively humid. As ascertained by qualitative examination, samples of water taken from four wells in the interior of the town showed serious organic contamination.

There was no evidence of recent pollution in the shape of ammonia, but chlorides, sulphates and nitrates were found to be present in abundance. In a fifth well situated in an open space near the ruins of the citadel, and well above the area of probable pollution, ammonia, arising probably from the decomposition of dead leaves, was present, but no traces of the salts, above-mentioned, were found. Some twelve years ago, a leper is said to have been drowned in this well, and, although the body was taken out shortly after the accident had happened, the water was considered to have been irreparably contaminated, and has never since been used. As far as my examination went the water of this well appeared to be, in every way, more wholesome and better fitted for domestic use than that of any other well in the town. Analysis of a sample of water taken from the well near the encamping ground at a considerable distance from the area of pollution, also showed that the ground water in this locality was really of good quality, and that the excess of saline matter found in the town wells is probably derived from sewage pollution. On examining the shaft of a new well recently made, I found that it had been sunk through a stratum composed, for the most part, of sand and clay blackened in many places with a sewage looking deposit, and having layers of broken bricks irregularly interspersed in it, with a whitish saline efflorescence on the surface. It need hardly be remarked that wells should not be sunk in a formation made up of debris already contaminated with organic matter, as in the instance here given, or that water obtained from such a source is likely to be fitted for domestic use.

Remarks by Sanitary Commissioner. Recommends that this report be forwarded for the information of the Deputy Commissioner and Civil Surgeon of Hoshiarpur, and that whatever action be determined upon to remedy the sanitary defects pointed out by the Deputy Sanitary Commissioner, this office be informed of the same in due course.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

- (a). Drainage of the land still marshy, to be completed as far as possible.
- (b). Of the Rs. 600 now in the hands of the Committee, Rs. 200 will be expended in erecting and repaving latrines, Rs. 100 on cleaning the wells of town, and Rs. 100 on paving part of it. The Deputy Sanitary Commissioner's remarks on the pollution of wells by drainage were explained by the Committee.

(BY THE DEPUTY SANITARY COMMISSIONER, WESTERN CIRCLE.)

HUSSAN-ABDAL VILLAGE (RAWALPINDI DISTRICT.)

Inspected on the 18th November 1881.

This village, situated on the line of railway, is within two and a half hours run of Rawalpindi. Formerly there was a Magistrate stationed here, and it is since the transfer of his office to Attock the unsatisfactory state of affairs to be described, may be said to have commenced. Every little street in the village, was, it is believed, inspected, the lambardárs and Thanadár being present during inspection.

The filthy state of the village could scarcely be imagined. Every lane was strewn with dung leaves, and grass. Wherever in the village a little open space could be found, manure and ashes were stacked. Every yard had its heap of dirt, the accumulation of the soil of cattle. Around the village the people obeyed the calls of nature, within a trifling distance of the houses. There are two latrines well built and conveniently situated. Both were inspected. The women's latrine was very dirty, while as for the men's it was in such a state that no wonder the ground immediately outside the walls of the latrines was used rather than one should enter such a latrine shocking in its filth. There are two saráis, one a Government sarái, the other a work of charity. The former was clean, only it is believed because it was seldom frequented, but the latter was in keeping with the dirt of the village, and in its centre was a large heap of manure resting in a well marked hollow which had probably been the site of a well. There are three sweepers, but as no one in the village claims any authority over them, they do as little, as they can. It was suggested that such a state of dirt and filth be at once removed. The matter is simple, it requires only labour and most ordinary supervision.

Remarks by Sanitary Commissioner. Recommends that the Deputy Commissioner summon the lambardárs with the view to considering the best means of carrying out the sanitary improvements suggested by the Deputy Sanitary Commissioner, Western Circle.

Summary of Inspection Reports received from Civil Surgeons up to end of December 1881.

NUH TOWN (GURGAON DISTRICT).

Inspected on the 30th December 1881.

This town which is on a height, is situated at a distance of 26 miles to the South-west of the civil station, and on the four sides of which low caste people dwell. About 2 miles from this town, towards the North, there is a large pool of water, called "Chandini jhil," which receives the rain water of the whole surroundings, and where it lodges for a greater part of the year. During heavy rains the water rises to the walls of the town, and the whole place remains damp for a considerable period.

Salt is abundantly produced here by the following process:—Pans are dug out in the earth, plastered with lime, and then filled up with water from the wells. After a period of about 8 months, the supernatant water is thrown off, and that at the bottom crystalizes. It is afterwards stored up in pits. The salt thus procured answers the purpose of that dug out of the mines, except that it is a little more acid in taste.

The streets are very narrow. During the rains water collects all about the place. There are no surface drains to carry off the water, and the consequence is that it is obliged to run in its natural course.

There is no system of sewerage or drainage. The streets and lanes are cleaned by "chabacha" (tank) water. The town is divided into divisions for whose cleanliness each Member of the Municipal Committee is responsible, the whole being superintended by the Tahsildár, who takes great interest in the work.

Water for drinking purposes is obtained from wells situated about half a mile from the town, that of the wells in the town and its immediate neighbourhood being saline and bitter. There are two or three wells that supply good and wholesome water in the neighbourhood. These are situated at the banks of the tanks.

There is a small katcha compound outside the city wall reserved as a slaughter-house. It is divided into two compartments by a katcha wall, which, however, always comes down in the rains. One is used for sheep and goats, and the other for kine. The place for goats and sheep should be quite separate and at a distance from that of the kine.

The burial grounds are at a distance of about 50 yards to the West of the town walls, and the cremation ground at a similar distance to the East. The Tahsildár states that they will shortly be removed to some distance from the town.

Nuh is known to be the unhealthiest place in the Gurgaon district. Fever is always more or less prevalent, and the people are anæmic and generally unhealthy.

If arrangements be made to drain off jhil water, which keeps the place so damp during the greater part of the year, the health of the people would certainly improve.

The conservancy arrangements, although on no organized system, seem to be well looked after by the Members of the Municipal Committee. Recommends that this report be forwarded for the information of the Municipal Committee, through the Deputy Commissioner of the district, and that the exertions of Pandit Mannu Lal, Tahsildár, in furthering the cause of vaccination and sanitation be brought prominently to the notice of the Municipal Committee.

GHASERA VILLAGE (GURGAON DISTRICT).

Inspected on the 31st December 1881.

There are many sanitary defects in this village which are, more or less, injurious to the health of the residents, such as keeping many cattle in the houses, storing up of cow-dung in heaps, and defect of conservancy, &c.; but it is most difficult, if not impossible, to put a stop to these nuisances under the present arrangements.

As the water of the wells in the village and its vicinity is saline, it is procured from wells at a little distance from the village.

No particular arrangements. The chaukidárs are supposed to look after the general cleanliness of the village. No Municipal sweepers are entertained.

Recommends that the attention of the lambardárs be invited, through, the Deputy Commissioner, to the want of proper conservancy arrangements in this village, and the establishment of manure godowns outside the village limits.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT BY CIVIL AUTHORITIES.

Orders have been issued to zaildárs in whose circle Ghasera is situated to inspect the village and cause the lambardárs to have it cleaned. Endeavours will at the same time be made towards inducing the villagers to deposit their refuse at a convenient distance from their houses; but the collection of all sweepings in one place would lead to endless disputes and trouble in the village community when the season for manuring the land arrived. No regular system of village conservancy can be adopted without appointing sweepers on fixed wages, and Deputy Commissioner would most strongly deprecate this, or any other measure which would add in the least degree to the already too heavy burdens borne by village proprietors.

SIRSA TOWN.

Inspected on the 5th, 6th and 7th April 1881.

The town of Sirsa was laid out about 45 years ago by British authorities on the North-east of the ruins of the old town of the same name. It is laid out into wide straight streets, is of a quadrangular form, having seven gates, viz. : two on the North, two on the South, two on the East, and one on the West. It is enclosed by a low mud wall, and is surrounded by a deep katcha ditch.

The main streets which are paved with kankar in the centre, and red bricks on the sides, are provided with surface drains on each side which discharge themselves into an outfall drain which is carried across the ditch on to the waste land outside the Rania gate to the west of the town. This outfall drain, however, does not serve the purpose for which it is intended, being broken down in many places. The side streets are neither paved nor provided with drains. With a few exceptions, all the streets, more especially the main streets, are generally kept clean and free from offensive smell. The sweepers' mohalla is generally found in a very dirty state.

The faecal matter from the houses is removed by private sweepers, and is taken outside the town to a convenient distance at the appointed sites to be there buried in trenches and covered over with dry earth. The sweepings of the bázárs, streets and houses, together with other rubbish of various kinds, are heaped up at certain appointed sites in different parts of the town, from whence the contractor is supposed to have them removed once a day and taken outside the town to be utilized in brick kilns, &c. These heaps are not removed for days together, but faecal matter is thrown over them by private sweepers instead of being taken out of the town daily. The houses and court-yards are kept fairly clean; but in some cases, more especially among the poor, they are very dirty owing to a number of cattle being lodged under the same roof.

The greater portion of the surface drainage of the town, during the rains, is carried into the pond near the great Sikh temple situated on the Western part of the town near its enclosure wall. This is very objectionable, as the water of the pond is held sacred by all the Sikhs of the districts and most Hindus of the town, by whom it is used for bathing and many other, than drinking purposes. During the rains water stagnates in some streets from defective natural drainage. This should be soon attended to.

There are 47 pukka wells from which the water-supply is obtained. Of these, 22 are situated within the town walls, and 25 in its immediate vicinity. The spring level is from 80 to 90 feet below the surface. Some of the platforms have no sufficient slope to prevent the waste water from re-entering the wells. In some cases the wells are surrounded by dirty offensive stagnant water owing to their being no proper reservoirs and gutters.

There are three well situated public latrines at a convenient distance outside the town. One is on the South, the other on the West on the ruins of the old town, and the third North, in the jungle called Bir. Each contains a very large quadrangular piece of land divided by sufficiently high walls which forms a partition and divides them into compartments—one for males and the other for females. With the exception of one situated outside the Rania gate, each latrine is properly roofed and well ventilated. The male portion of the Rania gate latrine is divided into compartments which are not roofed, but the female enclosure has distinct seats with only a low screen wall in front. Formerly these latrines were attended to by a proper establishment of Municipal sweepers at a cost of Rs. 25 per mensem. In 1877 they were made over to a contractor at a cost of Rs. 14 per month; and at present he only charges Rs. 7 for keeping the three latrines clean. From the state in which the latrines were seen during inspection this seemed a very bad economy. The dry earth system of conservancy is never heard of. With the exception of one female latrine in the Bir, there were no 'gamlaahs' or any other kind of utensils in any of them. All the latrines, without exception, are very filthy, their floor being covered with a regular stratum of dry and fresh human excreta soaked with urine, which poisoned the whole atmosphere of the vicinity of each place. Unless a proper establishment of sweepers be attached to each of these latrines, and the dry earth system be rigidly carried out in them, and a regular daily inspection made by a Conservancy Darogha, their state will not improve in a sanitary point of view; and the sooner these points are attended to the better. The latrine at the Rania gate requires to be properly roofed, and glazed 'gamlaahs' supplied to all. One sweeper on Rs. 4 per mensem and one sweepress—if possible the wife of the former—on Rs. 3 per mensem, should be attached to each latrine, and made to live on the premises, as is the case in other stations.

The slaughter-house is a large quadrangular enclosure situated outside the Latori gate about $\frac{3}{4}$ of a mile from the town. It is divided into two compartments by a wall, one for sheep and goats, and the other for kine. No sweeper is attached to this place, the butchers being obliged to keep it clean. During the time of inspection it was found to be in a very filthy state, large quantities of garbage, offal, &c., being heaped up in different parts. The butchers should be fined for this gross neglect, and for the future, the Municipal Committee should appoint a sweeper on Rs. 4 per mensem to keep the place clean, his salary being paid by the butchers themselves.

Remarks by Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the extracts from Civil Surgeon's inspection report of Sirsa with a view to the defects pointed out being remedied as soon as possible in consultation with the Civil Surgeon.

It would perhaps be advisable for the Municipal Committee to undertake the monopoly of the town scavenging and sale of filth, &c., to be stored in godowns at convenient sites outside the town.

The wells should all be provided with parapets and waste water conduits.

The latrine soil appears to be sold at a merely nominal price, and by an arrangement very much to the discomfort of those using these places. The slaughter-house, garbage, &c. might be added to the rest of the refuse as manure material.

ACTION TAKEN BY MUNICIPAL AND DISTRICT COMMITTEE ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

Seven sweepers have been permanently appointed and posted at the three public latrines of the town of Sirsa, and other arrangements for the removal of filth, &c., have been so made as to ensure better cleanliness of the town.

FAZILKA TOWN (SIRSA DISTRICT).

Inspected on the 12th November 1881.

Preliminary remarks. Fazilka is a town with about 7,000 inhabitants now, and is steadily increasing, situated on the left bank of the Sutlej about 5 or 6 miles inland. It is a very busy place, carrying on an extensive trade in wool and camels. The town is well laid out with broad streets, but the drainage is defective.

Streets and drains. The streets are broad and well laid out, but are mostly unpaved; in fact only the two main streets and one side street are paved, and these require to be re-metalled. The drains which run along the sides of the paved streets are too narrow and shallow, being about a foot wide in some places and six inches in depth. These drains are not

traceable in some places, having been silted up and built over. There are no drains along the unpaved streets. The main drainage channels are mostly 'kacha' and are unsuited for the purpose on account of the sandy soil.

The sewer drains are very imperfectly cleared, flushing being out of the question as there is no continuous channel. The conservancy arrangements, although not as perfect as might be, are fairly good. Very little refuse is found lying about the streets; but unfortunately that found is of the worst kind, and consists chiefly of faecal matter.

System of sewerage, drainage and conservancy arrangements in force.

There are no regular slaughter yards, the butchers being obliged to kill the animals in their own houses. The Municipal Committee are to take this subject into consideration and provide selected sites at a suitable distance from the town.

Slaughter-houses.

The first necessity to be considered, and which has not received sufficient attention, is effective drainage. The main channels which received the whole of the drainage of the city, judging from their appearance, have not been cleaned for years. The drainage of the South-west portion of the town has been allowed to fall into a ditch running just outside the boundary wall. This can be easily avoided by extending the pukka drains over the ditch, and allowing it to fall into a kacha one on the opposite side of the road which runs within a few yards, and which in its turn, if also extended, would discharge itself into a tank near by. The tank is so extensive that it might be made, with very little trouble, into a reservoir for the whole of the city drainage. This arrangement would be a very great boon to the people for watering their cattle in. These defects have been personally pointed out to the Extra Assistant Commissioner in charge, and he has promised to give the matter his special attention.

Remedial measures to be adopted and other suggestions.

Recommends that the early attention of the Municipal authorities be invited for the more effective drainage of the town and to the other sanitary defects pointed out by the Civil Surgeon, and that this office be informed in due course what steps have been taken in the matter.

Remarks by the Sanitary Commissioner.

SHAHABAD TOWN (UMBALLA DISTRICT).

Inspected on the 8th December 1881.

The general condition of the town is very dirty. The Members of the Municipal Committee knew nothing of the population, number of houses, &c., and seem to be very careless.

Preliminary remarks.

The streets are very narrow, those with pavements being, as a rule, in very bad repair. A large quantity of the drainage of the principal streets settles near town wells, which are much frequented by the people, namely, that by the pukka serai, and the butcher's well. The filthiest of all the mohallas, which are very dirty is the Gardian mohalla. The drains are in the centre of the streets.

Streets and drains.

There is no system of sewerage or drainage carried out. No place is set apart for the storing of street sweepings and filth, nor are any arrangements made for collecting and disposing of it. A large profit might be made if the sweepings, &c. were sold as manure.

System of sewerage or drainage and conservancy arrangements in force.

The water-supply is said to be good. The principal wells are, namely, the Jagadhri, Dyers, Butchers and the Serai wells. The Dyers carry on their trade by their well, and the refuse is carried down to the Butcher's well, round which it collects in a large filthy pool.

Water-supply.

There are two latrines, viz.: one for males and the other for females, which are never used. No fines have been levied during the year for breach of sanitary laws. They are most probably not in force.

Latrines.

At the time of inspection not a single sweeper was present. They were said to be sweeping the encamping ground.

No special places are set apart for slaughtering purposes. The Butcher's mohalla is one large slaughter-house, each Butcher killing the animals in his own compound.

Slaughter-houses.

There are two cremation grounds, one of which is situated on the banks of the river Markanda, and the other on the edge of a dirty drain near a brick-kiln. There are thirty-two burial grounds all of which are uncared for. There is a well situated in the small burial ground of the Weavers and Rajput mohallas, which is freely used for drinking purposes by the inmates of a neighbouring hamlet called Majri. This burial ground and well should both be closed.

Cremation and burial grounds.

Miscellaneous. Situated as Shahabad is on high ground on the banks of the river Markanda, with a good and plentiful water-supply, and with every facility for proper drainage, there is no reason why sanitation should not be attended to, and not neglected as it is at present.

Remarks by the Sanitary Commissioner. Recommends that this report be forwarded through the Deputy Commissioner for the information of the Municipal Committee.

BUNGAH TOWN (JULLUNDUR DISTRICT).

Inspected on the 4th April 1881.

Preliminary remarks. This town has fallen off very much in trade since the Railway was opened, it having been once a great sugar-mart, and the residence of many wealthy Sáhúkárs. There are large sections of the town in ruins.

After the dispensary was visited, the school, which is an open quadrangle, three sides of which are formed by the boarding house built this year, was inspected and was found very clean and comfortable. The building consisted of two large well ventilated rooms, and several smaller ones. Except the want of a little sweeping, no complaint could be found in regard to the ventilation and sanitary arrangements.

Many oxen and buffaloes were tethered inside the town. During the inspection sugar was seen to be spread out and vigorously trampled upon. Hindú temples were frequently met with, but no masjids were seen inside the town.

Streets and drains. The Naya bázár, which is entered after leaving the school must have been a place of great business at one time, having broad thoroughfares, shops, lofty and pukka verandahs and well paved roads. All is now changed, for comparatively very few of the houses are occupied and many are in ruins. The drains of the old narrow and irregular main street and gullies are broken up in many places, and the road out of repair, but they were all well swept.

System of sewerage, drainage and conservancy arrangements in force. The street conservancy is carried out by ten sweepers, and two bhishtis are employed for watering the roads. The dry rubbish and sweepings are collected and then removed by Nehalla, the Contractor for the purpose of burning bricks to the kilns. The liquid sewage runs off in two drains one towards the South-west and the other from the opposite side, into a large hollow piece of ground about 200 yards from the outskirts of the town where it collects and forms a blocked filthy channel. The sewage used to run into a large pond outside the city, but the channel was blocked up, and an elongated cesspool now remains.

Water-supply. None of the wells have anything like efficient masonry protection, and proper drainage to keep the surroundings clean. The well in the Mehtar's mohalla was exceedingly dirty from its neglected state and that of its neighbourhood. There are two tanks, one which is near the Dharmasala, is a fine piece of work and must be of great benefit to the town. The other is close to the main road, and is much frequented by travellers.

Latrines. One latrine is on the edge of the town, and the main street of the bázár seems to lead directly into it. This latrine, which is very offensive, will be removed to a suitable site, which has been approved of as soon as the harvest is gathered in. The other latrines were found to be clean. They are all merely large open spaces enclosed by a kacha wall. The people generally resort to the fields and open maidans in preference to going to these latrines.

Remedial measures to be adopted and other suggestions. It would be a great task, beyond all doubt, to remodel the surface drainage, to block up open pernalahs, to remove chahbachas, and to ventilate private houses.

Remarks by the Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the faulty state of their street drainage, with the view to the preparation of a plan and estimate for a comprehensive system of sewerage by open surface gutters at the sides of the streets, so as to do away with the present sinks (chahbachas) and the stagnant cesspools outside the village. The proposals to be submitted to this office for opinion.

The Civil Surgeon does not say what sum is realized by the town sweepings, latrine, ordure, &c. It ought to be sufficient to meet nearly the entire cost of the conservancy establishment. There ought to be fixed manure stores at suitable sites for the depositing of all manure of filth, &c.

All the wells should be protected by parapets and waste water conduits connecting to the nearest street drain.

PHILLOUR TOWN (JULLUNDUR DISTRICT).

Inspected on the 9th April 1881.

There is a small detachment of Native troops in the fort, to which a cantonment used to be attached about half a mile off. There are now only a number of detached bungalows and barracks remaining, the present dispensary being in one of these, and is furnished with convenient out-offices.

The school that was inspected was not kept as clean as it should have been. Eighty children were present when it was visited, but it was said that often more attended. If such be the case, the building is far too small for the accommodation of so large a number. The building, compound, well and privy should be kept scrupulously clean, which was not found to be the case. There is also a boarding house for twenty pupils. A sweeper is employed @ annas 8 per mensem, for keeping the premises clean, if practical sanitation should be taught anywhere, it is particularly needed in the schools.

The school room should be well swept and thoroughly ventilated, and a clean protected well and latrine should be kept on the premises.

The main bazar is immediately outside the station of the Sindh, Punjab & Delhi Railway, where a flourishing trade seems to be carried on, judging from the numerous shops and customers. From this branch a number of narrow streets at right angles to it which are fairly paved and with small gutters on each side. One main street leading from the tahsil to the dispensary has recently been paved, and should serve as a model. The streets were very clean when compared with the dirty house drainage, chahbachas, &c., which is a great eye sore.

There is an entire absence of any regular system of drainage in the town, although a sewer might easily be made for the purpose of carrying the rain-water and house sewage into the river Sutlej. At present the pernalahs generally open into receptacles at the bottom, which are below the level of the road, and exceedingly objectionable in a sanitary point of view.

The spring level of the wells used for drinking purposes is about 30 feet from the surface. The river is resorted to for washing and drinking purposes. The surroundings of the wells are in fair order, but many want raised platform, parapets, and drainage channels. There are no tanks.

There are three latrines with kacha-pucka walled enclosures, which are only resorted to by females. These are kept clean by a Mehtrani. They were clean and free from smell, but the dry-earth system was not in force. The tops of the houses are greatly resorted to for the calls of nature. The ordure is thrown into hollows and buried.

No regular slaughter-house is kept. No fault was found with what was seen, there being more unsightliness than anything actually prejudicial to health.

There is a Christian burial ground in the plantation which is well enclosed and looked after by a Chaprassi. A Muhammadan burial ground is close by it, which is kept clean.

Cremation is performed anywhere at the river side.

Remarks by the Sanitary Commissioner. Recommends that the attention of the Municipal Committee be drawn to the defects of the street drainage pointed out by the Civil Surgeon with the view to their arranging for the discharge of the town sewage through a main out-fall drain into the river. Any proposal suggested to be submitted for opinion to this office before adoption.

The wells should all be provided with protecting parapets and waste water conduits connecting with the nearest street drain.

Recommends that the attention of the Deputy Commissioner be invited to the defects of the school house with the view to their early remedy.

The plantation referred to should be cleared out to allow of free ventilation through its area.

TARN TARAN TOWN (AMRITSAR DISTRICT).

Inspected on the 17th April 1881.

Tarn Taran is a small unwallled and unimportant town, except that it is a place of considerable sanctity, and bears a reputation for being one of the healthiest places in the Punjab. There is a tradition that lepers, in days gone by, were cured by bathing in the tank attached to the shrine, and in consequence of which the Government have established a Leper Asylum at Tarn Taran within reach of the tank. A large bi-annual fair is held here

There are few, if any, defects. The town is well drained and has channels on each side of the streets. The drains should all have been made saucer shaped, and not square as many of them are. The drains empty into three wet places, and into a tank at the Senurwala mohalla. It would be better if Singáras were grown in this tank and fish put into it, rather than leave it as it is; or it may be filled in, but if this be done, there would be no place for the flood water to go to.

Streets and drains. The waste water, &c., from the houses is let down into the street channels by "pernalabs" as in all Indian towns. Refuse and night soil is removed by the sweeper on donkeys to three kilns, where it is burnt. The contractor pays the Municipality about 1,200 yearly.

System of sewerage, drainage and conservancy arrangements in force.

The water-supply is obtained from 73 wells, viz., 61 used by the Hindus, and 12 by the low castes. The wells are never cleaned out, but the water in them is excellent.

Water-supply.

There are no latrines. As there is a large bi-annual fair held, and also a considerable monthly gathering, arrangements should be made to start a regular latrine system. The smells at night are very offensive, and the amount of human excrement which lies about the place, is considerable. French latrines with moveable glass screens should be put up.

Latrines.

The slaughter house is small and is not kept clean, its precincts being used for the purposes of nature.

Slaughter-house.

Remarks by the Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the remarks of the Civil Surgeon regarding the want of public latrines with the view to the early provision of these public conveniences. Repairs to old drains; and all new drains should be on the "saucer shape" pattern, and not the square or angular pattern. It would be advisable to arrange for an intercepting sewer to catch all the town sewage and convey it away to a distance from the town. The emptying of the drains into the Senurwala tank is most objectionable and should be remedied as soon as possible. Suggests that a comprehensive plan for the drainage of the town be prepared, the intercepting and outfall drains being first arranged for, and executed as funds are available. Any plan proposed, to be submitted to this office for opinion. The state of the slaughter-house requires immediate attention. The tanks should be protected against pollution by special arrangements in consultation with the Civil Surgeon.

ACTION TAKEN BY THE MUNICIPAL AND DISTRICT COMMITTEE ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

Latrines and slaughter-yard. "Steps will be taken to keep the precincts of the slaughter-yard clean, and screens will be provided as temporary latrines during future fairs."

Drainage, &c. "As new drains are constructed, the saucer shape will be adopted, and during the next cold weather a plan for removing the sewage at a distance from the town through an open sewer will be drawn up and submitted for Sanitary Commissioner's approval."

POPE NAKA VILLAGE (GUJRANWALA DISTRICT).

Inspected on the 2nd and 23rd April 1881.

Pope Noka is a good sized village occupying an elevated site directly on the road to Botala. It is about 7 miles from Gujranwala and 5 from Botala. A deep swamp encircles the village on the East and North, whilst it is shut in on the North-west by high mounds. The soil has a large admixture of sand, and is soft and porous. The land round about is extensively cultivated, yielding very fine crops. Wells worked by Persian wheels are numerous. Water is found readily and in abundance at an average depth of from 22 to 25 feet.

Preliminary remarks.

Those which commonly prevail in villages generally all through the Province. The streets are very narrow and crooked, none being paved. Most of the lanes are cul-de-sacs. Not the slightest attempt at cleanliness was anywhere apparent. All the filth and refuse mixed with the ordure of "man and beast,"—which might be made to pay for more than its removal if systematically stored outside the village,—lay about in heaps rotting beside gutters all through the village.

Chief sanitary defects and suggestions.

Water-supply. Is obtained from three pukka wells, viz, one new one and two old ones. The latter are in bad repair and require cleaning out also. The water in all three was impure.

Conservancy. There is no establishment, nor any arrangement whatever for the removal and disposal of filth. There are no latrines, nor any boundaries fixed round the village to indicate the area to be kept clean.

Remarks by the Sanitary Commissioner. Recommends that the Deputy Commissioner be asked to summon the village lambardárs with the view to their making arrangements in consultation with the Civil Surgeon for the establishment of mud-wall enclosures (*khad gudáms*), one for each ward of the village, as receptacles or storage sites for all village refuse of every kind till required as manure for the fields. Also for the repair of the wells.

KAMOKI VILLAGE (GUJRANWALA DISTRICT).

Inspected on the 29th April 1881.

Preliminary remarks. Kamoki is situated directly on the Grand Trunk Road about 12 miles South of the Sadr station. There is an encamping ground for troops near by, to the East, a station of the Northern State Railway a few hundred yards to the North and a large pukka serai for native travellers almost adjoins the village to the West. Directly between the village and Grand Trunk Road is a large brick building constructed for a dispensary, but used now as a school. The habitations, without exception, are entirely of mud, and the inhabitants state very curiously that they refrain from using burnt bricks in obedience to the wish of the founder of the village, a prohibition still religiously observed although they retain no knowledge of the time or circumstance under which it was made. The soil is a hard clay and the country round is very sparsely cultivated.

Chief sanitary defects and suggestions. The number of houses deserted and in ruin are very large in this village. Two in the very heart of the village were used as common latrines. The owners of these two ruins—Nowbut Singh and Mea Singh—reside in an adjoining street. I would suggest that they, as well as the owners of other ruins, should be called upon to rebuild them, failing which, they should be levelled.

Water-supply. The water-supply is obtained from nine pukka wells. Four have chubootras, and are better protected from pollution than the remaining five which have not. Three of the latter, moreover, are much in need of repair. The water in those in good repair as well as that of the encamping ground was clear and sweet. The water in three out of the nine wells was impure. These are "Bowaliwála," "Chuprawála" and "Bysaki lambardár ka kho."

Conservancy. There is no establishment, and consequently no attempt is made at removing the filth and refuse which lies rotting in heaps all through the village just wherever deposited. The inhabitants were very solicitous for the appointment of two or three sweepers, not a large number for so large a village, and it does not appear impossible that if they could be sanctioned and the sweepings and refuse properly stored and sold, that the proceeds would go largely towards defraying their maintenance, seeing that the ordinary sweeper can be engaged on Rs. 2-8 a month.

Remarks by the Sanitary Commissioner. Recommends that the Deputy Commissioner summon the lambardárs with the view to considering, in consultation with the Civil Surgeon, the best means of carrying out the sanitary improvements suggested by the Civil Surgeon. The use of uninhabited tenements as latrines should be prohibited, and the places so used be properly cleaned. The wells should all be provided with parapets (*banerá*) and waste-water conduits. The suggestion to entertain sweepers for the village conservancy is deserving of special attention. The sweepings should be stored in mud wall enclosures at suitable sites outside the village and sold to defray expenses of conservancy. These enclosures should be proclaimed as the only sites where village rubbish and household sweepings, &c., are to be deposited.

MORALLIWALA VILLAGE (GUJRANWALA DISTRICT).

Inspected on the 29th April 1881.

Preliminary remarks. Moralliwála is a good sized village about 7 or 8 miles from the Sadr on the road to Shekhopura. The houses are all small, and built, some of clods and some of sun-dried bricks. A few houses, with an old shrine in the centre, stand out prominently on a tower-like embankment surrounded by the remaining habitations. A few narrow crooked gullies, which also answered as sewage drains, were the only means of communication through the village. Some attempt at a circular road appears to have been made at some previous time, but portions have become obliterated, whilst a deep and wide pool of stagnant water 30 or 40 yards in length causes a total interruption on the North side, as the fields closely border the pond on the North side and the houses on the South.

Chief sanitary defects and suggestions. Recommends the opening out of some of the narrow gullies, and making two or three fairly wide streets, for the sake of improving both communication and ventilation. The appointment of, at least, two sweepers to remove filth and refuse. Fixing a boundary of not less than 50 yards wide outside the circular road with mud pillars to indicate the area to be kept clean, and to fill in the pond of stagnant water on the North.

Water-supply.	The water-supply is obtained from 13 pukka wells. Ten are in good order, and three are in need of repair; but one of these last is falling in, and has long been in disuse and should be filled in.
Conservancy.	There is no establishment, and consequently nothing whatever is done.
Remarks by the Sanitary Commissioner.	Recommends that the lambardárs be summoned by Deputy Commissioner for purpose of arranging, in consultation with Civil Surgeon, for the proper conservancy of this village, and construction of manure stores at fixed sites outside circular road; for the repair of wells, and restoration of circular road and obliteration of the stagnant pool referred to. The appointment of two sweepers to look after the scavenging of the village, and proper disposal of house sweepings, &c., in the manure enclosures, would be of great advantage.

GHAKHAR TOWN (GUJRANWALA DISTRICT).

Inspected on the 4th May 1881.

Preliminary remarks. Ghakhar is situated directly on, and to the South side of the Grand Trunk Road, half way between Gujranwála and Wazirabad, being exactly ten miles from each. A few hundred yards Eastward, and on the same side, is the encamping ground, a large fodder godown, Police post and a small burial ground. Across the road at this point is a large serai for native travellers, with a separate room in one corner for Europeans. A station of the Punjab Northern State Railway is about four or five hundred yards directly opposite the village to the North. The remaining space in the other directions, that is, outside a radius of from 50 to 100 yards occupied by deep holes and hollows, is cultivated. About one-third of the houses are pukka; the rest kacha. Muhammadans predominate largely in this village.

Chief sanitary defects and suggestions. Recommends the appointment of a few sweepers; laying out a circular road; putting up mud-pillars to indicate the space to be kept clean all round, and within which all further excavating and digging of fresh holes should be stopped; the levelling and rebuilding of the houses in ruin, and the filling in of holes and hollows, especially the pool of slimy stagnant water inside the village almost adjoining the school, and near which is one of the largest wells of the village.

Water-supply. There are in all 18 wells. They are all pukka. Eight of these require repair. The water from several that were examined, as also of that from the encamping ground well, seemed clear and sweet.

Conservancy. No plan whatever.

Remarks by the Sanitary Commissioner. Recommends that the Deputy Commissioner be asked to consider the practicability of carrying out the circular road suggested by the Civil Surgeon. It is highly desirable that such a road should be laid out as early as possible for the purposes indicated. The pool of slimy stagnant water inside the village should be at once filled up and levelled with the general surface, with fresh earth brought from outside the village.

Recommends that the village lambardárs be summoned by the Deputy Commissioner to arrange, in consultation with the Civil Surgeon, for the adoption of the requisite measures to carry out the above suggestions, as well as to repair the wells in want of repair, and to establish a regular system of village conservancy by construction of manure store enclosures (*khád gudams*) at convenient and suitable spots beyond the line of the proposed circular road, and the regular conveyance and deposit of all village sweepings in them and elsewhere.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT BY DEPUTY COMMISSIONER.

"I arranged through the Tahsildár, Zaildár and Lambardárs for the filling in of the large hollow by the proprietors within three months. Four sweepers at a cost of Rs. 144 per annum have been appointed, and the amount will be realized immediately. The circular road has been prepared, and orders issued that no refuse be collected or hollows made within its limits."

"Re-building of houses is impracticable."

"Three wells have been cleaned, and orders issued about the remainder."

"The dung heaps have been removed, and strict instruction given on the subject to the headmen of the village."

EMINABAD TOWN (GUJRANWALA DISTRICT).

Inspected on the 12th May 1881.

Preliminary remarks. No additions, alterations or improvements have been made since the town was last inspected, *vis.*, 20th November 1880.

The Muhammadan burial ground, a portion of which was within the circular road, has been closed, and notices have been issued to clean and repair or level houses in ruin. Repairs to pavements and drains, and the removal of several dilapidated arches obstructing ventilation, are under consideration. The latrines are very foul; separate sweepers should be told off to look after them.

Streets and drains.

System of sewerage, drainage and conservancy arrangements in force.

A better system of removal and disposal of the town sweepings and street refuse has been planned at a recent meeting of the Municipal Committee.

There are two latrines which are in an extremely filthy state. A roof, and the dry-earth system put in force, would be a great improvement.

Latrines.

The burning of bodies at wells has been prohibited. The allotted places are alone, for the future, to be used. The burial grounds have also been limited, two instead of twelve, being considered sufficient.

Cremation and burial grounds.

Remarks by the Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to Civil Surgeon's suggestions regarding the public latrines. It is absolutely necessary they should be provided with light roofs supported on pillar props, and properly furnished for the dry-earth system of service if they are to be at all useful as public conveniences

Requests that this office may be furnished with a statement of the improved system of town scavenging which has been planned.

RAMNAGGAR TOWN (GUJRANWALA DISTRICT).

Inspected on the 19th May 1881.

Ramnagar is situated on the left bank of the Chenab, about 2 miles from the main channel; but not more than 500 yards from a branch of the river through which a considerable body of water flows for 8 or 9 months in the year. The town is distant about 27 miles West of Gujranwala, and 22 South of Wazirabad. From its situation, on the great line of salt traffic, at a point where all the salt was ferried across the river, and stored in large depôts until the customs dues were collected, the town had become, at the time of the annexation, a place of much importance, but since then, the trade having been diverted into various other channels, a large portion of the town has become deserted, and is gradually falling into ruin, and does not at the present time contain probably more than half its former population. The entire tract Westward being subject to inundation is enriched by alluvial deposit, and is in consequence extremely fertile, whilst the country Eastward is, on the contrary, arid and barren. The town was at one time enclosed by high mud walls and bastions with a deep ditch or dyke. The former have crumbled down and filled up, the latter in different places. All that remains of this surrounding consists of broken down gateways, unsightly mounds and deep hollows into which the greater portion of the town sewage finds escape. The main street is tolerably wide, the rest narrow. Most have been paved, but are just now in a sad state of disrepair. Fever is usually endemic for six or seven months in the year.

Preliminary remarks.

The sewage drains, some for want of sufficient incline, and others for want of repair, rather obstruct than convey away the town sewage. The sewers, which just now discharge themselves into the dykes, should at once be diverted into other and proper channels. The dyke itself with other holes and hollows containing sewage and stagnant water should be drained, and to effect which, the low lying country towards the river offers ready facility.

Streets and drains.

Are very defective, as may be judged from the above remarks. The whole system requires re-construction, after proper gradients by a competent Engineer, have been taken. No plan for storing or disposing of the town sweepings and refuse is yet in force.

System of sewerage, drainage and conservancy arrangements in force.

There are no less than 75 pukka wells, most of which appeared to be in fair repair, but several were noticed to have broken edges, which allowed of all the spilt water flowing back and polluting the contents. From the close neighbourhood of the river the water is near the surface, varying at most from 12 to 15 feet. The water is said to become a little muddy during the rains, but on the morning of the inspection it was clear and sweet.

Water-supply.

Latrines.

There are no latrines and they are much needed.

Remedial measures to be adopted and other suggestions. If the town could be divided into wards, and the Municipal Members induced to take a more practical interest in sanitary work, by each undertaking the supervision of a ward, very great improvements both in the cleanliness and healthiness of the town would surely follow. The same supervision if properly directed might also make the storage and disposal of the town sweepings and refuse a source of profit sufficient in time to defray the entire cost of the conservancy establishment.

Remarks by the Sanitary Commissioner. **Recommends that the Municipal Committee be invited to hold a special meeting with the view to giving practical effect to the Civil Surgeon's recommendations.** A scheme planned on proper gradients for the surface drainage and sewerage of the town is the first and most important measure to be provided for. The whole system of intra-mural gutters might empty into a peripheral intercepting drain, and this joined to an outfall drain emptying at some distance towards the river. The work could be carried out to completion on a fixed plan in parts as funds are available. The drainage of the dyke and hollows by an outfall drain should be done first. The system of town scavenging requires early and earnest attention. Some effort should be made to make this work more or less self-supporting. The system of extra-mural stores for town, sweepings, &c., and its systematic sale by the Municipal Committee has proved successful in other towns, and might be adopted here. The present conservancy establishment is under-paid and evidently requires to be properly organized. There is much to be done in this town. The Civil Surgeon's recommendations appear to be simple and practicable. The Municipal Committee should give the subject careful attention.

LALA MUSA VILLAGE (GUJRAT DISTRICT.)

Inspected on the 9th April 1881.

Preliminary remarks. Lala Musa is situated 10 miles from the Sadr, on the Grand Trunk Road to Jhelum. The site is not raised, and the drainage flows Westward to some ground below the surrounding level.

Chief sanitary defects and suggestions. The houses are unventilated and too closely packed. The cattle are now kept outside, but in the cold months they are sheltered under the same roof as their owners. There are dung heaps and sweepings in the court-yards which the Tahsildár has been ordered to have removed by the Deputy Commissioner. The village is permeated by only one narrow, tortuous lane.

Water-supply. The water-supply is obtained from two wells whose cylinders are unplastered and which have no platforms. The spring level is 45 feet from the surface, and the water sweet and clear. The wells are worked by wheel and by hand and the water does not stagnate.

Conservancy. The people go a-field. The animal dung and sweepings are removed at long intervals.

Remarks by the Sanitary Commissioner. **Recommends that the Deputy Commissioner be requested to summon the village lambardárs with the view to their arranging for the systematic removal of village refuse and filth of all sorts, in consultation with the Civil Surgeon.** The establishment of manure godowns (*khád gudám*) should be insisted on—mere mud wall enclosures 30 or 40 paces square, and walls 3 feet high—one for each mohalla at about 100 yards outside the village. The houses of each mohalla may be grouped together into four divisions, and the godown of the mohalla divided by cross walls into four corresponding compartments. This for facility of division of the stuff when required as fuel for the kilns or manure for the fields. The object of the godowns is not only to furnish a recognised and fixed site for the collection and deposit of all sorts of refuse and filth, but to protect it from damage by the passage of cattle, &c., over it and to preserve its salts and strength from injury by rains and surface drainage, besides the great desideratum of reducing the number of dungheaps all round the village to a limited few. The distribution and division of the manure amongst the contributing houses should be supervised by a lambardár to prevent disputes. The lambardár should also arrange for the construction of parapets and waste water conduits for their wells.

KUNJAH TOWN (GUJRAT DISTRICT.)

Inspected on the 24th April 1881.

Preliminary remarks. The town of Kunjah is built on an ancient site which is raised, and is situated 7 miles to the West of the Sadr on the Shahpur road. The houses are unventilated and too closely packed. The town is in the line of drainage from the overflow of the Bhimber river, which fills a depression on the East side. But the overflow does not pass so freely in this direction for the last two years. One of the three excavations which receives the drainage water and which is now full, is in course of being filled up by the Municipality. The members are advised to discourage the entrance of human beings into these foul pools of drainage water.

Street and drains. One main street runs through the town, also five narrow winding lanes and sixteen blind alleys. The main street and portions of some of the lanes are paved and have side drains. The pavement is broken up a great deal, but the Municipality are deficient in funds to repair it.

There is a piece of very low ground in front of the Post Office in which during the rains the Chief sanitary defects and water collects and gives rise to very offensive smell, being surrounded on all sides by high ground. I see no means of draining the water off, but a pukka tank might be made which would confine the water to a restricted area and could occasionally be cleared out.

The conservancy establishment consists of two sweepers who confine their efforts to the main thoroughfare. There are no latrines, consequently the town is always in a dirty insanitary state; human ordure lying about in all directions. This is more specially the case in the early morning, as the people ease themselves all over the place under cover of the darkness. At least four latrines ought to be erected and a sufficient staff of sweepers maintained to keep both them and the streets of the city clean.

Remarks by the Sanitary Commissioner. Recommends that the attention of the *lambardárs* of this village be invited to the remarks of the Civil Surgeon under the head "chief sanitary defects and suggestions," also to the early provision of public latrines, and to the entertainment of a sufficient staff of sweepers to keep them and the streets clean.

SHUJABAD TOWN (MOOLTAN DISTRICT).

Inspected on the 18th November 1881.

Preliminary remarks. The town of Shujabad (the second largest in the district), is the head quarters of one of the five *tahsils* of the district of Mooltan. It is situated at a distance of about five miles East of the Chenab, and the country round it is well watered by inundation canals, which are supplied from the Ravi and Chenab. The land is fertile and well cultivated, the chief *rabbi* crops being barley, wheat, turnips, gram, &c, the *kharif* crops, indigo, rice, bajra, &c. In years when the river is unusually high, considerable portions of the surrounding country are covered with water from overflowing of the river and canals. In this case, or when there is a heavy fall of rain, which, however, but seldom occurs, the water stagnates for a long time in consequence of the almost total absence of natural drainage. The town is raised several (probably about four or five) feet above the surrounding country. It is rectangular in shape, and is surrounded by a pukka wall, which is in a good state of preservation. The longer side of the town runs nearly due North and South. There is a central street which running North and South divides the town into two halves, other streets running from East and West form rectangular blocks of buildings. There are a good many shops, and some houses outside the walls on the Northern and Southern sides; there are fewer on the Western side, and scarcely any on the Eastern side. Most of the houses are pukka.

Streets and drains. Most of the principal streets are paved with pukka bricks set on their edges, and are fairly clean. They have a drain at either side, which is angular instead of saucer shaped. Such of the smaller streets as are paved are made to slope towards the centre. There are several under-ground pukka drains, some of them running under blocks of dwelling houses; these end just out side the walls of the town. They are seldom cleaned and most of them are in a filthy state. Such drains in a native town, which is situated in a rainless tract of country, are most objectionable and are probably fertile generators of disease.

System of sewerage, drainage and conservancy arrangements in force. Probably nine-tenths of the drains are not flushed more than once or twice in twelve months. Thorough flushing takes place only when the rainfall is sufficient to effect that. None of the drains are clean, most of them have the bottom covered with a more or less thick layer of dust which has been mixed with refuse water thrown from shops or houses and has thus become hardened. In other drains, which from being near wells have received occasional small supplies of water, there is collection of dark decomposing offensive matter.

The system of conservancy is not satisfactory. There are 16 sweepers for sweeping the street, &c., and four *bhishtis*. For the removal of the night soil and sweepings there are six Municipal bullocks, but these are said to be insufficient for the purpose.

Up to the current year the manure of the city was sold by retail (at the rate, I believe, of one rupee for 100 bullock loads); but from the 1st January 1881 the whole was farmed out to a contractor. Most of the Members of the Municipal Committee consider that the new system has been a failure. The contractor has raised the rate of the manure, and the *zamindárs* do not, therefore, come so readily for it. Formerly they assisted the six Municipal bullocks in removing the manure from the town; as they do not do this now, the result is (the Members of the Municipal Committee say), that the town is not kept so clean as it was before. I think it not improbable that the complaint arises from the fact that the new system interferes with the vested interests of some of the more wealthy men in the town. The contractor much more effectually prevents manure being taken away without its being paid for than the Municipal *chaprassi* probably did in former year. The system of carrying out part of the night-soil and sweepings by Municipal bullocks, part by *zamindárs'* bullocks, is thoroughly wrong in principle, and cannot be successful. The contractor pays Rs. 300 for the whole of the night-soil, sweepings, &c., of the town; in the previous year the income derived from selling it was Rs. 260.

There are said to be 35 pukka wells inside or immediately outside the town. It is reported that they are cleaned out once a year, but I hardly think that the cleaning is sufficiently thorough. The amount expended during the past year on the work was Rs. 332. The wells must be to some extent polluted by the foul stagnant water which is allowed to remain in their immediate vicinity.

There are six latrines, I saw two of them. They are simply a space enclosed by four mud walls. To make them fit to be used with decency they should have a number of partition walls, and be furnished with earthen pans, &c.; at present the fields are infinitely preferable to them.

Remarks by the Sanitary Commissioner. Recommends that this report be forwarded to the Deputy Commissioner and that the Municipal Committee be informed of the suggestions made by the Civil Surgeon under the head "*Chief sanitary defects.*"

LAN VILLAGE (JHANG DISTRICT).

Inspected on the 10th June 1881.

Lán is a pretty large village situated on somewhat raised ground at about 26 miles from Maghiána, and 3 miles East of the river Jhelum. It is remarkable for its very narrow passages in the interior. Unlike most of the villages of the district, the houses are very closely built together. Some additions are being made to the village on the West, while on the East there is a large excavation where rain water stagnates for long periods. The flood water of the country round about is, however, prevented from entering the excavation by a "*bund.*"

Chief sanitary defects and suggestions. 1. *Unprotected wells.*—Which should be provided with proper parapets and "*channas*" (wooden planks on the side where the bullocks work).

2. *Neglected conservancy.*—Attention should be paid to surface cleanliness, and no one should be allowed to collect manure, or perform the office of nature within 200 yards of the village.

3. The excavation should be filled up. The people of the village say that this is being done.

Water-supply. Plenty, and of pleasant taste and good appearance. It is derived from 4 wells worked by Persian wheels and bullocks, *viz.* 3 inside and 1 outside the village. All of the wells are exposed to contamination from cow-dung and surface drainage during the rains. They have imperfect or no copings.

Conservancy. No systematic conservancy is carried out in the village. Most of the people go a-field, but many do not do so. Heaps of filth and rubbish are met with and vile odours assail an unaccustomed visitor. No limit is fixed for the collecting of manure and filth or to perform the office of nature.

Remarks by the Sanitary Commissioner. Recommends that the village lambardárs be summoned to discuss with the Deputy Commissioner and Civil Surgeon the best means of providing for the proper conservancy of the village and protection of wells from pollution, as pointed out in the report. Perhaps the village might be able to entertain one or two sweepers to look after main thoroughfares and the care of "*khád gudáms*" which should be established as soon as practicable.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

A district meeting was held lately for the purpose of distributing zaidári and lambardári *inams* (rewards) at which almost all the zaidárs and lambardárs were present, and at which the principal recommendations of the Civil Surgeon with regard to village sanitation were explained by the Civil Surgeon and Deputy Commissioner. The zaidárs and lambardárs agreed:—

1. To fix boundaries within which no one should ease himself.
2. To protect drinking wells.
3. To establish manure heaps at some distance.
4. To allow no new hollows to be excavated, and to fill up the old ones by degrees.

The Deputy Commissioner is of opinion that good progress in the two first at least may be expected.

VASU AND ASTANA VILLAGES (JHANG DISTRICT).

Inspected on the 14th October 1881.

Both these villages were inspected in company with Zaidár Darwesh Muhammad, and Jamadár Jowahir Singh. The villages are comprised in one *mouza*, and are situated on the right bank of the river Jhelum at a distance of $3\frac{1}{2}$ miles, and about half a mile from each other. Both are situated on level ground. There are two large hollows near each, where rain water collects and stagnates for several months together, and which are used for the purpose of collecting filth in. The mud houses in Astana are wide apart and capacious, but narrow and crowded together in Vasu.

The sewage is dry. There are no urinals. The drainage is effective, but the extension of pavement with side drains is very desirable, especially on the South side where the drainage outflow is arrested. The people go a-field generally; but those who use the house tops keep private sweepers. The Native Doctor is now required to inspect the roofs weekly for the better removal of night soil. The street refuse is sold and has brought only Rs. 32 for the current year. A large income is not obtainable for want of competition in the sale. The street refuse, &c., is carried outside by the sweepers to appointed places, whence it is conveyed away in donkey panniers by brick-burners who contract for its purchase.

System of sewerage, drainage and conservancy arrangements in force.

The water-supply is obtained from 51 wells, of which 7 are in disuse. The cylinders of only 5 are plastered, 41 have masonry platforms, and only 6 reservoirs. Forty-eight are worked by hand, and three by wheel. The water is sweet and clear, but decomposes from stagnation. The spring level averages 23 feet from the surface. Arrangements were made with the Municipality to have these wells cleaned out.

Water-supply

There are two extra-mural latrines walled across to separate the sexes. A resolution was passed at the last meeting held by the Municipal Committee to the effect that the seats should be repaired and pans provided for them, and that the dry-earth system should be adopted. The sewage is removed twice a day and is thrown into shallow drains close by from which it is taken by cultivators and brick-burners.

Latrines.

Remarks by the Sanitary Commissioner. Recommends that the Municipal Committee be invited to convene a special meeting for the purpose of adopting measures to improve the conservancy of the town and increase the income derived from the sale of town sweepings and latrine soil. The construction of street gutters on each side of metalled or brick-paved roadways requires attention. It would be desirable to prepare a plan for the paving and draining of the whole town on a uniform system, the work to be carried out in blocks from time to time as funds are available. The aid rendered by Zaildār Maulah Dad is worthy of commendation.

JALALPUR TOWN (GUJRAT DISTRICT).

Inspected on the 22nd October 1881.

There is one main street from East to West, and three narrow lanes which permeate the town; all these are paved and have shallow side drains. There are beside several narrow, tortuous, unpaved blind alleys. The pavements and drains have recently been repaired and are in good order.

Streets and drains.

The people generally go a-field or resort to the extra-mural latrines. Private sweepers in mohallas carry the dry sewage from house latrines to the fields where it is now buried for future use. The side drains along the paved streets convey storm water through several outfall drains into excavations outside where it stagnates. These cesspools are ordered to be reserved for animals. It is proposed to utilize the smaller excavations by selling the ground to cultivators. The streets are swept by the conservancy establishment who deposit the refuse outside for removal to the kilns and to the fields.

System of sewerage, drainage and conservancy arrangements in force.

From wells, which are 88 in number. All are built with masonry, but their cylinders are unplastered. Sixty-three have masonry platforms, one having been recently built, most of the wells have been cleaned out this season. Twenty wells have reservoirs, but they are all disused. The building of conduits from reservoirs for waste-water is under contemplation.

Water-supply.

There are six extra-mural latrines which are divided for the accommodation of the sexes. Each has a male and a female sweeper on Rs. 4 and Rs. 2 per month respectively. Pans have been placed in the seats, and dry-earth is now used. The sewage is now trenched outside for future disposal. The repairs of the masonry seats have been sanctioned. There are six urinals consisting of wooden screens, with earthen vessels placed in masonry wells, which are daily cleaned.

Latrines.

Two places outside are used for slaughter of animals, and are distant about 200 yards. Both are unwallled. These areas are trenched for blood and covered with earth. The offal is buried outside.

Slaughter-houses.

There are four cremation grounds which are distant about 400 yards from the town, and which are all unwallled. One is situated near a kacha tank, which does not receive town drainage, it being used by mourners. The side nearest to the cremation ground is to be walled in at the desire of the Municipal Committee in order to protect the water from the dust and ashes that are blown about.

Cremation and burial grounds.

Remarks by the Sanitary Commissioner.

Recommends that the attention of the Municipal authorities be invited to the sanitary defects and suggestions made by the Civil Surgeon in this report.

DINGAH TOWN (GUJRAT DISTRICT).

Inspected on the 27th May 1881.

Dingah is situated 22 miles North-west of the Sadr station, on the Shabpur road. It is in the line of drainage of the Pabi hills, and the Salt Branch Line of Railway passes near it.

Preliminary remarks.

There are eight permanent streets, and six blind lanes. The former are all paved and have drains either side, or central, which are in fair order. Only one drain was in a foul and neglected state on inspection, the owner of which was admonished by the Tahsildár.

Streets and drains.

Sewage dry. The drainage is satisfactory, and storm water enters excavations and natural depressions on all sides of the town, where also the drainage from the Pabi hills rests for long periods. Some of these hold stagnant and foul pools, which the Municipal Committee have agreed to reserve exclusively for cattle.

System of sewerage, drainage and conservancy arrangements in force.

There are three kacha tanks, within short distances of each other which are to be kept for the people to bathe in. These do not receive town drainage, their banks are to be protected to exclude cattle.

There are no urinals in the town. The people generally go a-field, except the aged and sick who use the house tops and who keep private sweepers. The house-tops are inspected weekly by the Native Doctor. The street refuse has produced an income of Rs. 190 in the current year. The storage sites are to be enclosed as godowns. The streets and courtyards were clean. The refuse is removed three times a day, and is chiefly consumed in brick kilns.

The water-supply is obtained from 23 wells. One cylinder is plastered, nineteen have masonry platforms, and fifteen have reservoirs. Nineteen are worked by hand, and four by Persian wheel and hand combined. Water decomposes in a fortnight if the wells are not worked, even though ropes be unslung. The water is clear and sweet. One well is disused. They all need to be cleaned out, and the Municipal Committee has agreed to begin this work.

Water-supply.

There are two extra-mural latrines. The sewage is trenched for disposal since last inspection. The Municipal Committee have passed resolutions to provide seats and earthen pans for these latrines, and cells for storage of dry earth outside, which resolutions have been submitted to the Deputy Commissioner for sanction. The employment of a second female sweeper has also been passed.

Latrines.

With reference to the Sanitary Commissioner's advice to add the latrine filth, &c. to the refuse in godowns, the Municipal Members desire to keep them separate, as the latrines are several hundred yards distant, and the conservancy establishment cannot be increased for the conveyance of the filth.

One open space about 200 yards outside the town is used for slaughter. This area is trenched, and the blood and offal is buried daily. This area is to be enclosed.

Slaughter-houses.

The report is encouraging. Requests that this office may be informed as soon as the improvements agreed to by the Municipal Committee have been carried, viz.: protection of bathing tanks; enclosure of manure godowns; cleaning out of wells; furnishing latrines with seats and earthen pans, which should be of glazed pottery; enclosure of slaughter yard.

Remarks by the Sanitary Commissioner.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

"The proposals about the protection of tanks have to a great extent been carried out—the estimate for the enclosure of manure godowns is still under considerations; two wells have been cleaned already, and the Committee will instruct people to clean out the other wells. The latrines have been furnished with seats and earthen pans."

NURPUR VILLAGE (SHAHPUR DISTRICT).

Inspected on the 16th December 1881.

Núrpúr is a rather scattered village, situated on a sandy plain about half way between the Jhelum and Indus rivers; a trade in cotton and woollen cloths is carried on with merchants from Afghánistan, who come down in the winter months. The weather becomes extremely hot in the summer months, and the rain is scanty, but the health of the town is fairly good.

Preliminary remarks.

If the hollows about the villages—which are the property of the zaidár, and which he intends to give to the people gratis for the purpose of building houses on—are filled in with good earth a great nuisance will be removed; but care should be taken that they are not filled in with filth.

The unprotected wells should have proper copings, and the ground about them kept clean.

The neglected conservancy should be improved by fixing manure godowns at 200 yards from the village walls, and not allowing the people to ease themselves within the village limits.

The water-supply is obtained from 9 wells at Vasu, and 8 at Astana, and is apparently of good taste and colour. Most of the wells have no, or defective, parapets, and many of them want “channas” or wooden planks, on the side where the bullocks work. They are all exposed to pollution from surface drainage and cow-dung.

There are no fixed sites for the collection of “khad,” no fixed boundaries within which people should be prohibited from easing themselves. Heaps of manure may be seen in, and immediately outside the villages, which in some places lies putrifying in the dirty water of the hollows.

A special sanitary conversation was held in both of the villages, at each of which about 30 men were present. At these meetings the knowledge of the people, with reference to sanitation, vital statistics, vaccination, &c., was tested and increased by questions, which were answered partly by the residents of the village and partly by the officiating Civil Surgeon.

A list of the sanitary defects to be remedied was given to the zaidár, who promised to do his utmost in promoting the sanitary condition of the villages.

Remarks by the Sanitary Commissioner. Recommends that the zaidár and lambardárs be summoned by the Deputy Commissioner for the purpose of devising, in consultation with the Civil Surgeon, measures for the systematic and regular removal of village filth and refuse to fixed manure godowns outside the village beyond the line of a circular road to be marked out, or of pillars to be built as the limit within which the depositing of filth or ordure be prohibited.

The protection of the wells used for the supply of drinking water, and the filling up of hollows should be at the same time discussed and arranged for.

Requests that this office may be informed of the steps adopted to improve the sanitary condition of these villages.

MIRAK VILLAGE (JHANG DISTRICT).

Inspected on the 22nd December 1881.

Preliminary remarks. Mirak, which is a moderate sized village situated on a raised piece of sloping ground, lies on the left bank, and at a distance of 3 miles from the river Jhelum. The water level in the wells outside the village is 18 feet 3 inches from the surface, and inside 33 feet.

Chief sanitary defects and suggestions. The conservancy is very much neglected. Heaps of filth, including human ordure, are found on all sides within and immediately without the village walls, people ease themselves wherever they like.

The following suggestions have been made to the lambardárs and chaudharís, who seem quite ready to adopt them:—

1. To have walled “khad” godowns fixed at 200 yards from the village walls for the deposit of all kinds of filth, sweepings, &c.
2. To prohibit the people from easing themselves within the boundaries.
3. To have filth of all kinds carried daily to the “khad” godowns. For this purpose the people have adopted measures and signed an agreement amongst themselves for the payment of sweepers at the rate of 2 seers per *kharwar* of the harvest, and Re. 1 per marriage.

The following hollows exist:—

1. *Pirahianwala Toba*.—About 4 “bigha,” in extent. This has been partly cultivated. It would be advantageous if the whole of it were cultivated.
2. *Kharkiwala*.—About 1 “bigha,” and is partly cultivated. It may be entirely brought under cultivation. The deepest part should be filled up, and further excavation prohibited.
3. *Jiwan Khananiwala*.—Is quite close to the village walls and is partly cultivated. It is also being partly filled up to erect shops upon; but the very deep part which is used as a privy should be looked after. It should be either entirely filled up or brought under cultivation.

Water-supply. The water-supply is obtained from 8 wells, namely, 7 outside and 1 inside the village. They are all worked by Persian wheels and bullocks. They all need to be protected by parapets and “channas.” The owners of the wells and the lambardárs have promised to have all defects removed within a week.

This report is very satisfactory inasmuch as the people of this village have acquiesced to carry out the suggestions of the Civil Surgeon in regard to improving the insanitary condition of their village. Arrangements should also be made to provide all the wells with parapets, and waste-water conduits. Requests that this office may be informed in due course how far the Civil Surgeon's suggestions have been carried out.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The Chaudharis and other residents of the *Mauza* when sent for and called upon to explain the cause of non-attention to the Civil Surgeon's suggestions, promised to remove the defects at once, and proposed the following arrangements:—

1. The eight wells reported on by the Civil Surgeon will be provided with thatch and parapets as soon as bricks are ready. Arrangements have been made for burning bricks.
2. The three hollows, referred to in Civil Surgeon's report, the owners agreed to fill, and bring under cultivation as soon as possible.
3. The refuse godowns were proposed at a distance of 200 yards, and some sweepers entertained on payment of a rupee per marriage, 2 seers per *kharwar* of the harvest produce and sale proceeds of the manure. It was further determined that the village refuse should not be stored in any other place.

SHORKOT TOWN (JHANG DISTRICT).

Inspected on 24th December 1881.

Chief sanitary defects and suggestions for improvement of same. *Streets.*—The same as last year. Surface cleanliness not so satisfactory, as at the last inspection.

Suggestions.—Increased staff of sweepers is necessary, and I learn a provision has been made for the same.

Drains.—Exist in the paved bazar. They have nothing to carry but the rain water.

Drainage.—Which is very defective, can, it is hoped, be improved by digging a "Nullah" from near "Abkari" away into the fields towards the river, and orders have been given by the Deputy Commissioner to carry out this suggestion during the present winter.

Conservancy system.—Has been somewhat improved and filth is carried out of the town to 6 places; but the sites for "khád" godowns have not yet been walled. The resolution of the Municipal Committee to have only two "khád" godowns instead of 6, as previously shewn to me, and as they now exist, would I think not serve the purpose. The people of the town say it would be very inconvenient for them, and I from my personal experience of such affairs, presume it would be impracticable for them, to carry the filth of all quarters of the town to the 2 godowns.

Consists of 4 Municipal sweepers, and 2 sweepers paid from private subscription. They are not enough, but I learn a provision for increased establishment has been made in the next year's Budget. The establishment is very lazy and the supervision seems to be ineffective. The Hospital Assistant and some of the Members of the Committee now and then look after their work, but they seem to be too much favored by some other members. They may be daily supervised by a mate sweeper and punished for negligence by the Vice-President of the Committee, *i. e.*, the Tahsildár. The Hospital Assistant may keep the Tahsil authorities informed of the defects that he may find in the work.

As bad as at my last inspection. They seem only to be swept occasionally. Being so full of excreta that there is hardly room for people to place their feet upon, it is no wonder that are avoided as much as possible:—

Latrines.

A special sanitary meeting was held at the school premises where some 30 men were present and where the subjects of registration winter clothing, treatment of women during child birth, proper time for weaning children and vaccination were discussed.

Special sanitary meeting.

With reference to the latter subject the advisability of adopting vaccination as an obligatory household institution amongst the Hindús in the same way as "mundan" (shaving the hair of child) and "chola" (putting on a shirt for the first time) was dwelt upon.

Remarks by the Sanitary Commissioner. Recommends that the Deputy Commissioner be asked to convene a special meeting of the Municipal Committee for the purpose of discussing, and carrying out, as far as practicable, the suggestions made by the Civil Surgeon under the heads of "drainage, conservancy and water-supply," and that this office be informed of whatever action is determined upon.

ACTION TAKEN BY THE MUNICIPAL COMMITTEE IN THE ABOVE REPORT.

(a). The President enquired the income of the Municipality, and was informed that it is Rs. 1,300 per year on an average. The income up to the present date is Rs. 1,080-13-3, which has been collected by officials appointed for the purpose under the daily supervision of one Member of the Committee.

(b). The sanitary report of the Civil Surgeon with Dr. Bellew's remarks was translated and read to the members. The Civil Surgeon has clearly forgotten that the income of the town is very small, and there is actually no money in hand, except what is required to pay the existing establishment. Nor is the insanitary condition of the town at all so serious as is described by Civil Surgeon. The President has examined the latrines of the town. They are all spacious, in fact more so than is necessary for a population of 2,286 souls, and quite as clean as could be expected. There having been no money in hand for the repairs and improvements of the wells, private subscriptions have been raised and the wells are now generally in good working order. The Committee agrees to have four receptacles for the town refuse. Walls for these receptacles will be made when there is money. The six referred to by the Civil Surgeon are not required. An estimate will be prepared for extending the drain near the *Abkari* compound. The Committee must demur to the Civil Surgeon's opinion that fever is rightly ascribed to "more rainfall." There never have been excessive rains in the Jhang district. It is, however, a peculiarity of Shorkot that water lodges in its vicinity, though this prevails to a far less extent than in previous years. For instance General Cunningham in his account of Shorkot states that there was a large sheet of water near the town where there were plenty of fish, but the tank and the fish no longer exist.

(c). A proposal for making a drain near the house of Jind Wadda in the town could not be entertained for want of funds.

110. I append a list shewing the names of officials and non-officials whose services in the cause of Sanitation and Vaccination have been brought to my notice by District Officers and Civil Surgeons :—

District.	Name.	Occupation.	Place of residence.
Jhang	Rái Bahádur Chetan Shah	Civil Surgeon	Jhang.
Gurgaon	Lala Gokal Chand	Officiating Civil Surgeon	Gurgaon.
Lahore	Nawáb Abdul Majíd Khan	Magistrate, 2nd Class...	Lahore city.
Ditto	Pandit Janárdhan	Member of Municipal Committee; and Lecturer, Oriental College.	Ditto.
Delhi	Khan Bahádur Haidar Hosain Khan,	Member of Municipal Committee,	Delhi city.
Ditto	Hakim Zabar-ud-dín Khan...	Ditto ditto	Ditto.
Ditto	Muhammad Ikramulla Khan	Ditto ditto	Ditto.
Gurgaon	Pandit Mannu Lal	Tahsildár	Nuh.
Gujránwála	Harnarain	Member of Municipal Committee,	Rám Nagar.
Gujrat	Maula Dad	Zaildár	Kunjah.
Ditto	Mir Haidar	Native Doctor	Dingah.
Ditto	Harnam Dás	Munsif	Jalalpur.
Mooltan	Dharm Dás	Tahsildár	Shujabad.
Jhang	Gholám Mohayad-dín	Member of Municipal Committee,	Shorkot.
Ditto	Gulamjilani Shah	Ditto ditto	Ditto.
Ditto	Maulvi Chirág-ud-dín	Tahsildár	Adampur.
Ditto	Mehar Nur	Member of Municipal Committee,	Ditto.
Ditto	Bhavani Dás	Zaildár	Machhiwal.
Ditto	Bahádar Khan	Ditto	Dab Kalán.
Ditto	Makhdum Jalal	Ditto	Hassu Balel.
Ditto	Radhá Rám	Ditto	Ditto.

H. W. BELLEW, DEPUTY SURGEON-GENERAL,

Sanitary Commissioner, Punjab.

The first of these is the fact that the town of ... has been ...
 The second is the fact that the town of ... has been ...
 The third is the fact that the town of ... has been ...
 The fourth is the fact that the town of ... has been ...
 The fifth is the fact that the town of ... has been ...
 The sixth is the fact that the town of ... has been ...
 The seventh is the fact that the town of ... has been ...
 The eighth is the fact that the town of ... has been ...
 The ninth is the fact that the town of ... has been ...
 The tenth is the fact that the town of ... has been ...

for making a statement the name of which is in the town could not be other than the name of the town.

The first of these is the fact that the town of ... has been ...
 The second is the fact that the town of ... has been ...
 The third is the fact that the town of ... has been ...
 The fourth is the fact that the town of ... has been ...
 The fifth is the fact that the town of ... has been ...
 The sixth is the fact that the town of ... has been ...
 The seventh is the fact that the town of ... has been ...
 The eighth is the fact that the town of ... has been ...
 The ninth is the fact that the town of ... has been ...
 The tenth is the fact that the town of ... has been ...

Number	Name	Address	Occupation	Age	Sex	Color	Religion	Marital Status	Education	Other
1	John Doe	123 Main St	Farmer	45	M	W	Methodist	Married	High School	
2	Jane Doe	123 Main St	Homemaker	42	F	W	Methodist	Married	High School	
3	John Smith	456 Oak St	Teacher	35	M	W	Baptist	Single	College	
4	Jane Smith	456 Oak St	Teacher	32	F	W	Baptist	Single	College	
5	John Brown	789 Pine St	Blacksmith	50	M	W	Methodist	Married	High School	
6	Jane Brown	789 Pine St	Homemaker	48	F	W	Methodist	Married	High School	
7	John White	101 Elm St	Merchant	60	M	W	Methodist	Married	College	
8	Jane White	101 Elm St	Homemaker	58	F	W	Methodist	Married	College	
9	John Black	202 Maple St	Blacksmith	40	M	W	Baptist	Single	High School	
10	Jane Black	202 Maple St	Homemaker	38	F	W	Baptist	Single	High School	
11	John Green	303 Cedar St	Farmer	55	M	W	Methodist	Married	High School	
12	Jane Green	303 Cedar St	Homemaker	52	F	W	Methodist	Married	High School	
13	John Gray	404 Birch St	Teacher	30	M	W	Baptist	Single	College	
14	Jane Gray	404 Birch St	Teacher	28	F	W	Baptist	Single	College	
15	John Blue	505 Spruce St	Blacksmith	45	M	W	Methodist	Married	High School	
16	Jane Blue	505 Spruce St	Homemaker	42	F	W	Methodist	Married	High School	
17	John Red	606 Willow St	Merchant	50	M	W	Methodist	Married	College	
18	Jane Red	606 Willow St	Homemaker	48	F	W	Methodist	Married	College	
19	John Purple	707 Poplar St	Farmer	40	M	W	Baptist	Single	High School	
20	Jane Purple	707 Poplar St	Homemaker	38	F	W	Baptist	Single	High School	

U. S. DEPARTMENT OF COMMERCE

Factory Commission

APPENDIX A.

LAWRENCE MILITARY ASYLUM AT SANAWAR.

A.—Table showing the SICKNESS and MORTALITY among the CHILDREN of the above ASYLUM during the year 1881.

MONTHS.	Average strength.		Average No. daily sick.		No. daily sick per cent. of strength.		No. of deaths.		Died per 1,000 of strength.		CAUSIS OF DEATHS IN HOSPITAL.			
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Enteric fevers.		All other causes.	
											Boys.	Girls.	Boys.	Girls.
January	221	160	11.48	9.61	5.19	6.00	...	1	...	6.25	...	...	...	1
February	223	162	17.28	8.68	7.74	5.35	...	...	...	...	...	...	...	...
March	236	167	14.58	9.87	6.17	5.91	...	...	...	...	...	...	...	...
April	232	167	17.10	7.83	7.37	4.68	...	...	...	...	...	...	...	...
May	234	169	15.35	9.90	6.55	5.85	...	...	...	...	...	...	...	...
June	240	175	12.50	11.63	5.20	6.64	...	...	...	...	...	...	...	...
July	242	183	13.22	15.16	5.46	8.28	...	...	...	...	...	...	...	...
August	244	182	13.54	10.61	5.54	5.82	...	1	...	5.49	...	1	...	...
September	240	181	9.63	12.00	4.01	6.62	1	...	4.17	...	...	...	1	...
October	242	178	12.19	9.80	5.03	5.50	...	...	...	...	...	...	...	...
November	238	179	11.20	7.76	4.70	4.33	...	...	...	...	...	...	...	...
December	239	180	9.67	9.48	4.04	5.26	...	...	...	...	...	...	...	...
											...	1	1	1
For the year ...	236	173	13.14	10.19	5.56	5.89	1	2	4.24	11.56	...	5.78	4.24	5.78
											Died per 1,000 of the average strength.			

DISTRIBUTION of CHILDREN according to AGE on 1st July 1881.

SEX.	2 and under 5 years.	5—10.	10—15.	15—20.	Total of all ages.	REMARKS.
Boys ... ..	...	78	132	32	242	
Girls	2	52	111	18	183	
Total	2	130	243	50	425	

B.—TABLE showing the CAUSES of ADMISSIONS into HOSPITAL among the

year

Causes of admissions.	NUMBER IN											
	January.		February.		March.		April.		May.		June.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Small-pox
Chicken-pox	2	4	...	2	...	2	...	...	...	...	...	...
Measles
Enteric fever
Simple continued fever
Intermittent and remittent fevers	2	...	3	...	1	1	...	...	...	...	...	...
Malignant Cholera
Diphtheria
Hooping-cough
Mumps	4	...	36	2	9	1	6	6	3	5	...	7
Acute rheumatism	2	...	...	...
Phthisis pulmonalis
Meningitis
Sun-stroke
Epilepsy	1	1	...	...	...	...
Conjunctivis (ophthalmia)	1	1	2	...	1	...	...	...
Valve disease of heart
Croup	1	...	1	...	...
Bronchitis
Pneumonia
Dysentery	1	...	...	1	...
Diarrhoea
Ulcer	1	...	...	...
Tinea favosa	1	1	...	1	1	...	...	1	2
Itch
Wounds and accidents	2	...	1	...	1	...	2	...	1	...
All other causes	21	11	14	11	19	11	25	7	33	13	19	14
TOTAL	29	15	55	16	32	16	36	17	42	19	22	23

Admitted per cent. of the average

13-13	9-37	24-66	9-88	13-56	9-58	15-52	10-18	17-95	11-24	9-17	13-14
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CHILDREN of the LAWRENCE MILITARY ASYLUM, SANAWAR, during the 1881.

EACH MONTH.

July.		August.		September.		October.		November.		December.		Total admissions during the year.		Admitted per cent. of strength.		Died per cent of admission.	
Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
...
...	...	...	...	...	...	...	...	...	...	...	...	2	8	0.84	4.62	...	...
...
...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	0.58	...	100.00
...	...	...	...	...	...	...	...	...	...	...	...	...	...	4.24	1.16	...	...
1	...	2	...	...	...	...	1	...	...	1	...	10	2	...	...	...	...
...
...
...	7	...	11	...	12	1	4	1	8	...	3	60	66	25.42	38.15	...	...
1	...	1	...	...	...	...	...	...	...	...	...	4	...	1.69	...	...	...
...
...
...	...	...	...	...	...	...	...	...	...	...	...	1	1	0.42	0.58	...	...
...	...	...	...	...	...	...	...	...	3	2	...	6	4	2.54	2.31	...	...
...	...	...	...	...	1	...	...	...	...	1	...	1	3	0.42	1.73	...	...
...
...	...	...	...	1	...	...	...	1	...	...	1	3	2	1.27	1.16	...	...
2	...	...	...	...	...	...	...	...	...	...	...	2	...	0.84	...	...	...
...	1	...	...	...	...	...	1	...	...	...	...	1	2	0.42	1.16	...	...
1	3	1	...	...	2	2	...	1	2	2	...	10	11	4.24	6.36	...	...
...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	0.58	...	...
1	...	...	...	1	...	2	...	...	1	2	...	13	1	5.51	0.58	...	...
22	21	19	14	20	8	14	12	8	5	7	1	221	128	93.64	73.99	0.78	0.78
28	33	23	25	22	24	19	18	11	19	15	5	334	230				

strength in each month.

11.57	18.03	9.43	13.74	9.17	13.26	7.85	10.11	4.62	10.61	6.28	2.78	141.52	132.95
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LAWRENCE MEMORIAL ASYLUM AT MURREE.

A.—Table showing the SICKNESS and MORTALITY among the CHILDREN of the above ASYLUM during the year 1881.

MONTHS.	Average strength.		Average number daily sick.		Number daily sick per cent. of strength.		Number of deaths.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
January ...	83	59	0.16	0.00	0.19	0.00	...	...
February ...	88	60	0.48	0.00	0.54	0.00	...	...
March ...	89	70	0.25	0.83	0.28	1.18	...	...
April ...	89	69	0.83	0.6	0.93	0.09	...	...
May ...	90	69	0.19	0.12	0.21	0.17	...	...
June ...	91	69	1.01	0.33	1.10	0.48	...	...
July ...	93	69	0.87	0.19	0.93	0.27	...	...
August ...	92	69	1.60	0.00	1.74	0.00	...	...
September ...	92	67	0.40	0.00	0.43	0.00	...	...
October ...	93	65	0.25	0.00	0.27	0.00	...	...
November ...	90	67	0.06	0.2	0.02	0.03	...	...
December ...	90	64	0.25	0.96	0.28	1.50	...	...
For the year ...	90	66	0.53	0.21	0.59	0.35	...	...

DISTRIBUTION of CHILDREN according to AGE on 1st July 1881.

Sex.	2 and under 5 years.	5—10.	10—15.	15—20.	Total of all ages.	REMARKS.
Boys	34	48	11	93	
Girls	19	42	8	69	
Total	53	90	19	162	

B.—TABLE showing the CAUSES of ADMISSIONS into HOSPITAL among the
year

Causes of admissions.	NUMBER IN											
	January.		February.		March.		April.		May.		June.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Small-pox
Chicken-pox
Measles
Enteric fever
Simple continued fever
Intermittent and remittent fevers
Malignant Cholera
Diphtheria
Hooping-cough	1	...	...	...	...	...	...
Mumps	1	...	...	...
Acute rheumatism
Phthisis pulmonalis
Meningitis
Sun-stroke
Epilepsy
Conjunctivis (ophthalmia)	1	...	...	...	...	...	...	...	1	...
Valve disease of heart
Croup
Bronchitis
Pneumonia
Dysentery
Diarrhoea
Ulcer
Tinea favosa
Itch
Wounds and accidents	1	...	1	...	...	...
All other causes	1	...	...	...	1	1	4	2	...	...	2	1
TOTAL	1	...	1	...	1	2	5	2	1	1	3	1

Admitted per cent. of the average

1.20	...	1.14	...	1.12	2.86	5.62	2.90	1.11	1.45	3.30	1.45
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Date of Birth		Date of Death		Place of Birth		Place of Death		Cause of Death		Education		Occupation		Other	
Year	Month	Year	Month	Country	City	Country	City	Disease	Accident	University	College	Profession	Industry	Notes	Remarks
1850	1	1880	1	Canada	Toronto	Canada	Toronto	Heart Disease		University of Toronto		Teacher			
1855	2	1885	2	Canada	London	Canada	London	Stroke		University of Toronto		Engineer			
1860	3	1890	3	Canada	Montreal	Canada	Montreal	Pneumonia		University of Toronto		Physician			
1865	4	1895	4	Canada	Ottawa	Canada	Ottawa	Accident		University of Toronto		Lawyer			
1870	5	1900	5	Canada	Quebec	Canada	Quebec	Heart Disease		University of Toronto		Architect			
1875	6	1905	6	Canada	Halifax	Canada	Halifax	Stroke		University of Toronto		Merchant			
1880	7	1910	7	Canada	St. John's	Canada	St. John's	Pneumonia		University of Toronto		Physician			
1885	8	1915	8	Canada	Victoria	Canada	Victoria	Accident		University of Toronto		Engineer			
1890	9	1920	9	Canada	Vancouver	Canada	Vancouver	Heart Disease		University of Toronto		Physician			
1895	10	1925	10	Canada	Edmonton	Canada	Edmonton	Stroke		University of Toronto		Lawyer			
1900	11	1930	11	Canada	Calgary	Canada	Calgary	Pneumonia		University of Toronto		Physician			
1905	12	1935	12	Canada	Winnipeg	Canada	Winnipeg	Accident		University of Toronto		Engineer			
1910	1	1940	1	Canada	Saskatoon	Canada	Saskatoon	Heart Disease		University of Toronto		Physician			
1915	2	1945	2	Canada	Regina	Canada	Regina	Stroke		University of Toronto		Lawyer			
1920	3	1950	3	Canada	Saskatoon	Canada	Saskatoon	Pneumonia		University of Toronto		Physician			
1925	4	1955	4	Canada	Winnipeg	Canada	Winnipeg	Accident		University of Toronto		Engineer			
1930	5	1960	5	Canada	Calgary	Canada	Calgary	Heart Disease		University of Toronto		Physician			
1935	6	1965	6	Canada	Edmonton	Canada	Edmonton	Stroke		University of Toronto		Lawyer			
1940	7	1970	7	Canada	Calgary	Canada	Calgary	Pneumonia		University of Toronto		Physician			
1945	8	1975	8	Canada	Edmonton	Canada	Edmonton	Accident		University of Toronto		Engineer			
1950	9	1980	9	Canada	Calgary	Canada	Calgary	Heart Disease		University of Toronto		Physician			
1955	10	1985	10	Canada	Edmonton	Canada	Edmonton	Stroke		University of Toronto		Lawyer			
1960	11	1990	11	Canada	Calgary	Canada	Calgary	Pneumonia		University of Toronto		Physician			
1965	12	1995	12	Canada	Edmonton	Canada	Edmonton	Accident		University of Toronto		Engineer			
1970	1	2000	1	Canada	Calgary	Canada	Calgary	Heart Disease		University of Toronto		Physician			
1975	2	2005	2	Canada	Edmonton	Canada	Edmonton	Stroke		University of Toronto		Lawyer			
1980	3	2010	3	Canada	Calgary	Canada	Calgary	Pneumonia		University of Toronto		Physician			
1985	4	2015	4	Canada	Edmonton	Canada	Edmonton	Accident		University of Toronto		Engineer			
1990	5	2020	5	Canada	Calgary	Canada	Calgary	Heart Disease		University of Toronto		Physician			
1995	6	2025	6	Canada	Edmonton	Canada	Edmonton	Stroke		University of Toronto		Lawyer			
2000	7	2030	7	Canada	Calgary	Canada	Calgary	Pneumonia		University of Toronto		Physician			
2005	8	2035	8	Canada	Edmonton	Canada	Edmonton	Accident		University of Toronto		Engineer			
2010	9	2040	9	Canada	Calgary	Canada	Calgary	Heart Disease		University of Toronto		Physician			
2015	10	2045	10	Canada	Edmonton	Canada	Edmonton	Stroke		University of Toronto		Lawyer			
2020	11	2050	11	Canada	Calgary	Canada	Calgary	Pneumonia		University of Toronto		Physician			
2025	12	2055	12	Canada	Edmonton	Canada	Edmonton	Accident		University of Toronto		Engineer			

APPENDIX B.

POLICE FORCE.

No. 1.—TABLE showing the SICKNESS and MORTALITY among the POLICE FORCE serving in the PUNJAB during the year 1881, and the prevalence of the principal diseases in each month of the year.

MONTHS.	CAUSE OF DEATHS IN HOSPITAL.										Died per 1,000 of strength.	Number of deaths.	Number daily sick per cent of strength.	Average number daily sick.	Average strength.
	Small-pox.	Enteric fever.	Simple continued fever.	Intermittent and remittent fever.	Malignant cholera.	Phthisis pulmo-nalis.	Scurvy.	Apoplexy.	Heart disease.	Respiratory dis-eases.						Dysentery.	Diarrhoea.	Hepatitis.	Wounds and ac-cidents.	All other causes.	Died out of hos-pital.
January	1	...	1	...	1	8	...	1	...	...	4	16
February	5	...	...	...	...	5	1	2	...	...	1	17
March	...	2	...	1	...	...	...	...	7	1	...	...	...	2	17
April	1	...	...	...	...	2	...	...	...	...	1	8
May	8	...	...	...	...	2	1	...	...	1	1	11
June	...	1	...	...	...	...	...	...	...	...	...	...	...	2	10
July	3	...	...	...	...	...	...	...	2	10
August	1	...	...	...	...	...	...	1	...	...	...	7
September	2	15	...	...	...	1	...	...	...	...	...	9
October	3	14	...	...	...	3	...	1	...	...	3	15
November	3	5	...	...	...	2	...	4	...	...	1	14
December	1	...	...	...	...	8	1	...	...	...	2	14
	3	1	29	34	10	...	2	1	51	5	10	...	2	21	148
For the year 1881	19,527	318.12	1.63	317	16.23	1.63	317	16.23	2.61	0.26	0.51	...	0.10	1.07	7.58
For the year 1880	19,521	298.77	1.53	342	17.52	1.53	342	17.52	4.10	0.61	0.46	0.10	0.05	1.13	8.81

Died per 1,000 of the average strength.

NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.

CAUSES OF ADMISSION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												Total admissions during the year.	Admitted per cent. of strength.	Died per cent. of admissions.			
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.						
Small-pox	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Enteric fever	...	2	6	4	4	...	...	...	...	...	...	...	...	...	...	...
Simple continued fever	...	1	2	2	4	7	10	37	35	...	...	...	17	...	...	0.70	
Intermittent and remittent fever	184	113	135	166	200	156	159	1,122	1,028	600	222	...	4,595	...	...	65.38	
Malignant cholera	...	...	...	...	...	24	24	20	8	...	...	...	52	...	...	...
Rheumatism	23	20	18	23	19	22	19	17	9	16	22	...	230	...	...	...
Primary Syphilis—																		
Hard chancre (indurated bubo)	13	8	3	19	14	13	13	12	9	9	6	...	131	...	...	...	1.18
Soft chancre (suppurating bubo)	14	8	4	9	7	11	7	10	8	8	8	...	108	...	...	...	0.55
Secondary syphilis...	1	4	3	6	4	9	3	4	3	2	4	...	45	...	...	...	0.23
Phthisis pulmonalis	5	...	3	...	2	3	3	2	2	5	3	...	32	...	...	...	0.16
Scurvy	2	1	...	3	...	1	2	...	1	1	1	...	14	...	...	...	0.07
Apoplexy	...	...	...	...	...	...	...	...	...	2	...	...	2	...	...	...	0.01
Eye diseases	12	7	8	24	24	21	18	25	14	15	8	...	200	...	...	...	1.02
Respiratory diseases	75	44	49	31	22	8	9	16	28	54	78	...	439	...	...	...	2.25
Dysentery	21	18	17	24	22	25	19	67	68	56	23	...	384	...	...	...	1.30
Diarrhoea	4	4	11	11	11	19	12	23	11	10	8	...	142	...	...	...	0.73
Tænia	2	2	0.01
Hepatitis	...	...	1	1	1	1	...	1	6	1	...	...	12	...	...	...	0.06
Gonorrhoea	6	5	9	3	15	13	10	6	4	15	8	...	104	...	...	...	0.53
Guinea-worm	1	...	...	1	...	1	1	5	1	1	...	...	15	...	...	...	0.08
Abscess and ulcer	52	27	42	46	49	51	75	84	69	38	54	...	679	...	...	...	3.48
Wounds and accidents	13	11	10	12	14	10	15	11	4	10	12	...	131	...	...	...	0.67
All other causes	65	63	71	68	87	94	99	84	88	72	81	...	958	...	...	...	4.91
	493	336	392	454	499	465	467	891	1,396	926	538	...	8,406	...	...	...	43.05

Admitted per cent. of the average strength in each month.

For the year 1881

For the year 1880

2.52	1.72	2.01	2.32	2.55	2.38	2.39	4.56	7.93	7.15	4.74	2.75	43.05
2.85	2.55	2.50	2.83	2.52	2.55	3.09	3.80	3.85	4.08	3.65	2.93	37.21

No. II.—TABLE showing the SICKNESS and MORTALITY among the Police Force

Number.	DISTRICTS.	Average strength.	Number of admissions.	Admissions per cent. of strength.	Average number of daily sick.	Number daily sick per cent. of strength.	Number of deaths.	Died per 1,000 of strength.
1	Delhi ...	1,168	832	71.23	36.50	3.12	21	17.98
2	Gurgaon ...	512	167	32.62	7.22	1.41	8	15.62
3	Karnál ...	608	260	42.76	10.62	1.75	15	24.65
4	Hissar ...	533	211	39.59	8.13	1.52	13	24.39
5	Rohtak ...	450	242	53.78	5.91	1.31	7	0.15
6	Sirsa ...	370	207	55.94	5.42	1.46	6	16.22
7	Umballa ...	1,154	324	28.08	9.87	8.55	13	11.26
8	Ludhiána ...	551	259	47.09	8.43	1.53	5	9.09
9	Simla ...	205	34	16.58	1.73	0.84	1	4.87
10	Jullundur ...	507	219	43.19	10.47	2.06	9	17.75
11	Hoshiárpur ...	498	166	33.33	9.27	1.86	8	16.06
12	Kángta ...	411	188	45.74	7.53	1.84	6	14.60
13	Amritsar ...	918	725	78.98	22.86	2.49	45	49.02
14	Gurdáspur ...	591	231	39.09	7.15	1.21	10	16.92
15	Siálkot ...	537	127	23.65	6.42	1.19	7	13.03
16	Lahore ...	1,363	770	56.49	26.37	1.93	48	35.22
17	Gujránwála ...	481	170	35.42	10.10	2.10	5	10.42
18	Ferozepore ...	554	331	59.75	12.05	2.17	7	12.61
19	Rawalpindi ...	1,049	351	33.46	12.92	1.23	26	24.79
20	Jhelum ...	515	172	33.40	4.66	0.90	5	9.71
21	Gujrat ...	358	77	21.51	4.18	1.17	...	...
22	Shahpur ...	465	84	18.06	3.50	0.75	5	10.75
23	Mooltan ...	832	347	41.71	15.12	1.82	2	2.40
24	Jhang ...	472	117	24.79	6.55	1.39	2	4.24
25	Montgomery ...	481	196	40.75	3.74	0.78	...	...
26	Muzaffargarh ...	379	358	94.46	12.50	3.30	4	10.58
27	Dera Ismail Khan ...	583	153	26.24	5.41	0.93	5	8.58
28	Dera Gházi Khan ...	491	222	45.21	5.96	1.20	9	18.33
29	Bannu ...	465	154	33.12	3.48	7.48	2	4.30
30	Pesháwar ...	1,113	383	34.41	18.12	1.63	15	13.48
31	Hazára ...	461	173	37.53	6.36	1.38	2	4.34
32	Kohát ...	452	156	34.51	9.57	2.12	6	13.27
	TOTAL ...	19,527	8,406	43.05	318.12	1.63	317	16.23

servicing in each District of the Punjab during the year 1881.

CAUSES OF DEATHS IN HOSPITAL.

Small-pox.	Enteric fever.	Simple continued fever.	Intermittent and remittent fevers.	Malignant cholera.	Phthisis pulmonalis.	Scurvy.	Apoplexy.	Heart diseases.	Respiratory diseases.	Dysentery.	Diarrhoea.	Hepatitis.	Wounds and accidents.	All other causes.	Died out of Hospital.	Number.
...	8	...	1	...	1	...	5	...	...	...	...	1	5	1
...	1	...	...	...	...	...	7	2
...	3	...	...	...	...	...	2	...	...	...	...	...	10	3
...	1	...	1	...	...	1	3	2	...	...	...	...	5	4
...	2	6	5
...	1	...	...	...	...	...	1	...	...	...	...	1	3	6
...	1	1	...	...	...	5	...	1	...	...	3	2	7
...	1	...	...	...	1	...	...	...	...	...	3	8
...	1	...	...	...	...	...	...	9
...	1	4	...	...	...	...	2	...	...	...	...	...	2	10
...	1	...	...	...	...	...	7	11
...	6	12
...	8	12	1	...	...	...	4	...	3	...	...	4	13	13
...	2	1	...	...	...	...	7	14
...	7	15
...	4	17	3	...	...	...	5	1	3	...	...	3	12	16
...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	4	17
...	1	...	1	...	..	2	3	18
...	3	...	...	...	...	...	3	...	1	...	...	1	18	19
...	1	...	...	...	...	...	4	20
...	21
...	1	...	...	...	...	...	...	1	3	22
...	1	...	...	...	1	...	...	23
...	1	...	...	...	...	1	...	24
...	25
...	1	...	...	...	1	...	...	...	...	1	1	26
...	1	...	...	...	...	1	3	27
...	1	...	...	...	...	1	...	...	1	...	6	28
...	1	...	...	...	...	...	1	29
...	3	..	...	...	...	...	...	...	6	...	1	...	...	...	5	30
...	1	...	...	...	...	...	1	31
...	1	...	...	...	...	...	5	32
...	3	1	29	34	10	...	2	1	51	5	10	...	2	21	148	

APPENDIX C.

Copy of letter No. 1768, dated 9th December 1881, from DEPUTY SURGEON GENERAL H. W. BELLEW, C. S. I., Sanitary Commissioner, Punjab, to the Secretary to Government, Punjab.

I HAVE the honor to forward, in original, for the information of His Honor the Lieutenant-Governor, a report on the Fever Epidemic at Amritsar, during the Autumn of 1881, by Surgeon Major J. Bennett, Deputy Sanitary Commissioner, Eastern Circle.

2. Dr. Bennett, as will be seen from para. 2 of his report, commenced his investigation on the 22nd October 1881, or nearly a month after the disease had attained its height.

3. Owing to my being appointed Secretary and Member of a Special Cholera Committee, from 1st October, I was unable to inspect the city till after the end of that month.

4. I may add here that I entirely coincide in the remarks and opinions of Dr. Bennett as expressed in his interesting report.

REPORT ON EPIDEMIC, REMITTENT AND INTERMITTENT FEVER OCCURRING IN THE CITY OF AMRITSAR IN THE AUTUMN OF 1881, BY SURGEON-MAJOR J. BENNETT, DEPUTY SANITARY COMMISSIONER, EASTERN CIRCLE, PUNJAB.

In compliance with instructions contained in your No. 1343, dated 13th October 1881, received by me on the 18th idem, I proceeded to Amritsar to investigate the nature and peculiarities of the fever prevailing in that city, and I now beg to submit my report on the subject. I would here explain that in consequence of pressure of work connected with the carrying out of the details of the scheme for the reorganization of the Vaccination Department, lately sanctioned by Government, considerable delay in the preparation and submission of my report has unavoidably taken place.

2. Accompanied by Mr. Clarke, the Deputy Commissioner, and Mr. Nichol, the Municipal Secretary, I commenced my investigation on the 22nd October by visiting the various dispensaries in the city, at each of which fever patients in great numbers were seen being attended to. During the course of our visit, it appeared that the Assistant Surgeons and Hospital Assistants, as well as Hakims, who had been treating the sick throughout the epidemic were unanimous in their opinion that the sickness so fatally prevalent was due to malarious fever, and as far as could be judged from the appearance of the patients themselves, and the statements made by them regarding the symptoms from which they had been, or were still, suffering, the diagnosis, appeared to be correct; but owing to the enormous number of people daily crowding for relief, the work had been overwhelming, and there had been no time for accurate observation, or for keeping any record of clinical facts, from which reliable data could be obtained. Indeed during the worst period of the outbreak the daily number treated at the different dispensaries, and in the streets, by thirteen medical officers, is reported to have reached 10,000, being about 770 patients a day for each medical officer. A number, which, it is needless to remark, is beyond the powers of any one man to attend to in any but the most perfunctory and imperfect way. Although, however, there was but little time for accurate observations to be made in individual cases, two great features had been noticed as being specially characteristic of the disease, *viz.*, its periodicity in the vast majority of the attacks the febrile symptoms intermitted, after from six to ten hours duration, the paroxysms coming on at a certain time every day or every other day, and the fact that the regular administration of antiperiodics, quinine, cinchona febrifuge, &c., was usually attended with successful results.

3. The Mortuary Returns received from the Sanitary Commissioner's office shew that the minimum death-rate from fever was reached in July, thence it gradually rose in August, especially during the latter part of the month, when the epidemic may be said to have begun. An inspection of the annexed fever Chart for which I am indebted to Mr. Nichol, the Municipal Secretary, shews at a glance the daily rise and fall of the death-rate in the city of Amritsar from the beginning of the outbreak to the end of October. From this it is seen that, from the end of August to the 20th September, the death-rate from fever rose by successive and rapid waves, until the daily number of casualties from fever reached as many as 105; thence during the course of the following eleven days the fever line is seen to mount rapidly up through 130, 150, 170, respectively until 200 is reached on the 27th September, then descending to 175, it rises on the following day to 205, again to descend on the 1st October to 185, from which number it leaps up to 220 on the 3rd of that month, when the maximum point was attained. From the 3rd to the 5th of the month the death-rate is seen to fall rapidly to 165; and during the following week by successive and rapid falls to 105; from the 13th to the 31st October, (the latter being the latest date for which returns have been furnished) a daily

average number of 119 deaths is seen to be maintained, the maximum and minimum reached being 135 and 95 respectively. The ratio of admissions for fever in the Police and Jail Hospitals, compared with the death-rate from fever amongst the city population is shewn in the following table:—

STATEMENT No. I.

Admissions for Intermittent Fever per 1,000 of strength.

				June.	July.	August.	September.	October.
Police Hospital	...	...	...	15.4	87	92.0	193.8	55.8
Jail	„	...	...	14.9	6.9	443.7	408.1	60.2
				<i>Deaths per mille from fevers.</i>				
Amritsar City	...	...	...	20.3	15.0	25.20	207.2	386.0

This table shews a great increase in the ratio of admissions for fever into the Jail and Police hospitals (especially the former) in August, while the recorded death-rate amongst the civil population shews no increase from this cause until September. This is a feature which has been noticed in almost all the epidemics of autumnal fever in this country, the cause being found in the fact that, as intermittent fever in its early attacks seldom proves fatal, the death-rates are not influenced by the epidemic until about a month after its commencement. The prisoners, from the depressing conditions under which they live, and the lower stamina of constitution characterising this class, shewed, as might be expected, the effects of the malarial poisoning in greater degree than the members of the Police force appear to have done. The coincidence of the high admission rates in the two hospitals, and of the enormously increased death-rate amongst the city people, as seen in the above table, seems to point to September as the month in which the fever producing influence was most intense. That the death-rate in the city did not attain its maximum until the following month, does not argue against this view; for, as just explained, in an outbreak of malarious fever the increased mortality does not, as a rule, follow, until after a considerable interval the increase in the numbers affected with the disease. With but few exceptions, in the severe forms of fever examined by me, towards the end of October, cases in which fatal results were to be expected, the illness was found to have been of six weeks or two months standing. Very few recent or acute cases were seen. In the Jail and Police hospitals a great decrease is seen to have taken place in the number of fever admissions during the month of October.

According to the records, the daily number of applicants for relief attending at the different dispensaries, and of those treated in the streets and lanes appears to have been greatest between the 4th and 16th October, during which period the daily average mortality had declined about 36 per cent from the highest attained; but the numbers recorded cannot be taken as an index to the prevalence of the sickness, for it was found that the number of patients was in proportion, in a great measure, to the amount of *sherbet* distributed to them as a vehicle for cinchona febrifuge, and other medicines prescribed. At one dispensary, for example, the number of patients, which had been 1,368 on the 16th October, fell to 364 on the following day because the supplies of *sherbet* were stopped.

4. From causes which will again be alluded to, the mortality has been greatest amongst the poorer classes of Hindus and Muhammadans. The following figures shewing the distribution of deaths from fever according to classes from the 20th of August, when the rise in the mortality began to take place to the 31st October, were obtained from the Municipal office:—

STATEMENT No. II.

CLASSES.				Population according to Census of 1876.	Deaths from fever.	Ratio per 1,000 of population.
Hindus	...	...	...	66,093	2,572	38.9
Muhammadans	...	...	...	66,353	4,093	61.6
Other classes	...	...	...	3,642	194	53.2
TOTAL				136,088	6,859	50.4

From this it is seen that the Muhammadans have been by far the greatest sufferers. Taking the number of Hindus and Muhammadans as being nearly equal in point of population, the statement shews that the rate of mortality is in the proportion of 1 of the former to 1.6 of the latter; and this disproportion between the two classes is explained by the fact that a large proportion of the Muhammadan population is made up of poor, ill-fed and badly clad Kashmiris, on whom the disease fell heaviest, and committed its greatest ravages.

The mortality among children has been excessively high. Of a total of 6,859 deaths from fever 3,531, or more than half, are recorded to have occurred amongst children under twelve years of age. Compared with adults, infants and children, as is well known, shew a peculiarly marked susceptibility to malarious influences, as evinced by the more rapid supervention of dangerous symptoms, and the markedly greater tendency to spleen affection, wasting of the tissues, and the other sequela which characterise the state known as malarious cachexia; and to this no doubt the excessive mortality amongst these cases is to be ascribed. It would be interesting to know the proportion of deaths in infants under one year of age, and of children under five years of age, respectively, and to contrast it with the birth-rates for the same period, but no data are at present available. I have reason to believe, however, from the comparatively large number of young children seen to be ill with fever, many being in a state of great emaciation and weakness, that the death-rate amongst them must have been appallingly high. It would probably be no exaggeration to say that two-thirds of the infantile population have died since the commencement of the outbreak, and that the health of the remaining third has been so shattered that comparatively few, among the poorer classes especially, are likely to survive beyond their fifth year.

5. There can be little doubt, I think, that the outbreak was due to excessive rainfall obstructed drainage, rise of the spring level, and consequent water-logging of the soil. During the months of July and August, according to a return

Causation of the disease.

furnished from the Deputy Commissioner's office, a fall of 38 inches was registered, being 24 inches above the average for the previous 10 years, while that for September is shewn to be under the usual average. In consequence of this excessive downpour a great part of the ground about the city was covered with water, and the water in the city wells rose to about six feet from the surface. In the civil station, where both the drainage and the outfall are extremely defective, the greater part of the ground was for some considerable time under water, and the spring level is stated to have risen in many places to about a foot from the surface, while at one time the water in several of the wells actually rose to a level with the ground. This excessive rainfall is said to have been confined to Amritsar, and its immediate vicinity, that in other parts of the district being but little above the average; but no records are available to shew to what extent this irregularity of distribution took place. After this inordinate rainfall the atmosphere is described as having been heavy and moist to an unusual degree, while from the damp soil, drying up under the influence of a hot sun, the ground water at the same time beginning to subside, organic emanations from the decomposing animal and vegetable matter contained in it must have been given off in great abundance. Conditions which, it is needless to say, are well known to be highly favourable to the production of a poisonous influence by which paroxysmal fevers of severe type is not unfrequently produced. It is not improbable that there may have been other agencies at work, by means of which the fever producing influence was generated in an unusually poisonous form, but with the nature of these we are as yet imperfectly acquainted. Bad sanitary conditions although, perhaps, favourable to growth of the fever germ, although the specific microscopic plant to which malaria is now said to be due, do not appear to have had any material influence as a primary exciting cause: for in this respect the city of Amritsar is better off than most cities and towns in the Province, where autumnal fever has not been so fatally prevalent to anything like the same extent. Many intelligent natives blamed the well water as being one of the main causes of the outbreak. On the 30th October I analysed qualitatively samples collected from six wells, the water of which was said to be sweet and much used, and found them all clear and sparkling, free from taste or smell, even after having been kept for two weeks in closed bottles; but the qualification tests which were the only means at my disposal to decide the point, shewed evidence of sewage contamination in all. The water was alkaline in reaction; chlorides which are almost always found in wells situated inside the walls of towns and villages in this country, were present in considerable quantity, but no evidence of other sewage salts (nitrates, nitrites, or ammonia) was detected. At a subsequent period on analysing samples of water collected by Dr. Duke (lately appointed Civil Surgeon of Amritsar) from seven city wells, I found in all of them chlorides and nitrates present in abundance, while two shewed the presence of ammonia. Here we have unmistakeable evidence of sewage pollution; both recent or old; the consequent evidence of chlorides and nitrates pointing to the former, and that of ammonia in two of the samples examined, to the latter. The analysis of a sample taken as a standard of purity from a well in the Deputy Commissioner's garden, in which the water table was but five feet from the surface, revealed the presence of sulphates only (also present in the wells of the city) shewing that the excess of chlorides and nitrates found in the water of the city wells is really due to sewage pollution and to saturating of soil. The tubes of several of the wells in question were cracked, and close to the parapets of most of them were open drains containing stagnant sewage. But the water examined by me, contaminated as it undoubtedly is, is no worse than that used by natives in other towns of the Province, to me it seems a more significant fact, that the water in the wells is nearer the surface by 10 feet, than it was in 1878.

6. Not having had an opportunity of observing a case from the commencement of the attack to the end except in the milder forms which were of short duration, I can only allude to a few of the more characteristic features, which, during the course of my investigation came under notice. At a comparatively early period of the outbreak the sickness was so universally prevalent that not a single individual Native or European, in the city and civil station appears to have escaped its attacks; nine-tenths of the shops are said to have been closed, and the work of the Government offices was carried on with the utmost difficulty, owing to the general prostration with fever. Two forms of the disease were met with, common intermittent fever, and the ever but dangerous remittent form to which so many of the city people succumbed; but between these two there were many gradations partaking of characters common to both. In the vast majority of cases examined by me the fever was undoubtedly intermittent, the febrile symptoms recurring and subsiding at regular intervals, varying in length according as the fever was of the quotidian, tertian, or quartan type and presenting no essential difference from those which characterise the ordinary autumnal fever of this country. Symptoms not unfrequently observed at the commencement of the hot stage were violent bilious vomiting and purging, attended with pain and uneasiness in the regions of the stomach and liver indicative of congestion of those organs; and in cases of long standing, diarrhoea was a common symptom, but in no case did I see "choleraic" symptoms superadded to those of fever. During the attacks, the spleen, as a rule, become enlarged afterwards returning to its normal size in the period of intermission. When, however, in the absence of proper treatment, a rule to which there were but few exceptions, the paroxysms were frequently repeated, and the disease become chronic, the enlargement, accompanied by the usual signs of splenic cachexia, become permanent. Of 61 cases examined by Dr. Thompson, then Civil Surgeon, and myself, taken promiscuously from a crowd of fever patients at one of the city dispensaries, and from people met with in the streets, no less than 77 per cent were found to be more or less affected with spleen; the enlargement usually extending some considerable distance into the abdomen below the lower ribs. A notable feature in the case of several children examined was the attenuated condition of the abdominal walls from the great thinning of the muscles, through which the lower part of the spleen could readily be grasped in the hand. In many cases, especially amongst the poorer people, the body was much emaciated from the combined effects of fever and insufficient and inappropriate diet. In almost all the signs of inanition as well as of malarial cachexia were more or less marked, the tongue, lips and conjunctiva were pulled and bloodless, the face puffy and dropsical round the eyes, and the skin anaemic, sometimes jaundiced accompanied with liver affection; and not unfrequently dropsical swellings of the lower limbs with, in some cases general dropsy and albuminous indicative of the intensity of the malarial poisoning. Chronic diarrhoea and dysentery were also frequent concomitants, especially after the cold dewy nights of October had set in. In that part of the city inhabited by the Kashmiri Shawl-weavers, almost the whole of the population appeared to be suffering more or less, from the depressing effect of malarious cachexia and chronic starvation. The worst forms of this combination, were seen amongst children, and particularly amongst infants at the breast, many of whom, their mothers having lost health and strength from frequent or prolonged attacks of fever, were seen to be literally dying of inanition. As already pointed out the mortality amongst this class of cases, owing to the great susceptibility of children to affections resulting from malarial poisoning has been enormously large; more than half of the deaths amongst people of all ages occurring among children under 12 years of age.

In the cases of remittent fever examined, the history as far as could be gathered was the following: in many cases the febrile attacks, were at first only of some hours duration, being followed by periods of distinct intermission. After a week or ten days; in the absence of appropriate treatment, the sufferers weakened by successive attacks and unable to procure suitable food to restore their failing strength became more and more prostrate, while the paroxysms of fever continuing to recur became more and more prolonged, until, the one merging into the other, the disease assumed the remittent or continued form. In others, the fever, remittent from the first and lasting from seven to ten or twelve days, then changed its type and became intermittent. In others again of a more severe character the fever was ushered in by rigors followed in the hot stage by violent vomiting and purging with pain in stomach, liver and spleen, the latter as a rule being found to be enlarged and congested. In several bad cases seen by me there was high fever with great heat of head, the intellect appeared confused with inclination to go to sleep, and sometimes coma. In others the condition known as the typhoid state had supervened: dry brown tongue, sordes on the teeth; frequent, weak, fluttering pulse, and other symptoms of prostration were observed.

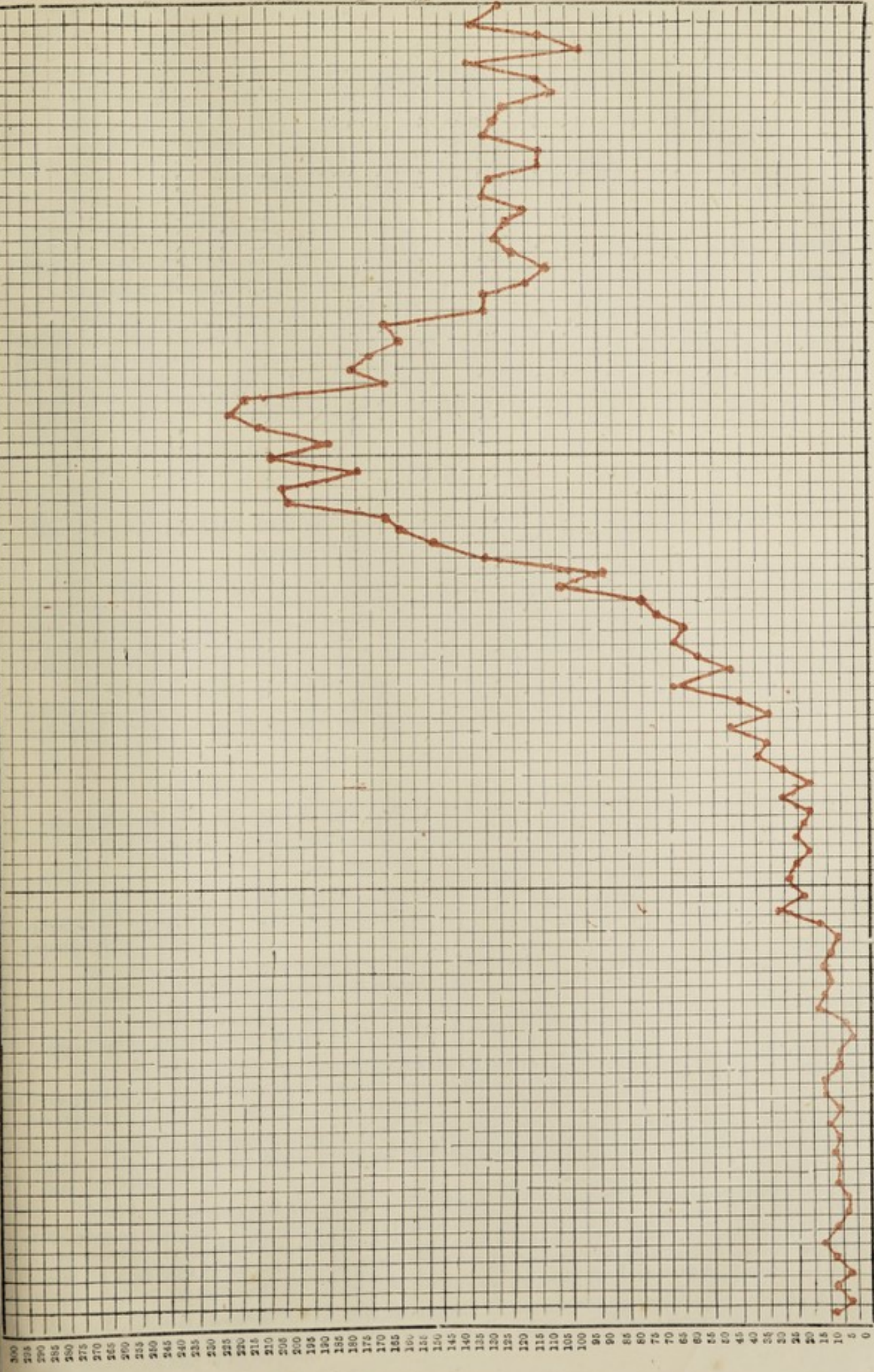
7. The opportunities of making post mortem examinations on those who had died from what may be termed acute forms of the disease did not present themselves, and it is to the appearances seen by me in four cases of long standing, in which death resulted from the combined effects of prolonged fever, and chronic starvation, admitted into the Sadr Dispensary in a more or less moribund state, that the following remarks refer. These cases, although perhaps not sufficiently numerous from which to draw any general conclusion, are instructive as being typical ones of a disease which was then, and is now proving so terribly fatal in the city. In the case of a Kashmiri admitted for "Ague and Diarrhoea," who died a few days after admission, there was some congestion of the mucous membrane of the lower part of the ilium, near its junction with the large gut; but in no instance were ulcers typical of enteric (typhoid) fever present. In all the bodies examined there was complete absence of fat in the mesentery, the coats of the bowel were much attenuated, and the mucous membrane had the appearance

of having undergone that peculiar form of degeneration, which has been described as characteristic of chronic starvation, when its glandular structure having lost, to a great extent, the power of absorbing food, death from inanition is the inevitable result. In all there was enlargement of the spleen, with much thinning of the muscles, and a state of intense bloodlessness and wasting of the tissues generally. In two cases extensive traces of disease of the lungs were found; the lung tissue was for the most part much consolidated with recent inflammation, and easily lacerable, resembling the liver in structure. In the case of a Kashmiri boy admitted for dysentery following prolonged fever, the body had been reduced to a skeleton; the post mortem examination revealed, in addition to enlargement of the spleen, small circular ulcers with blackened deposits round their edges, studding the surface of the mucous membrane of the large gut throughout its entire length. This was a typical case of malarious dysentery, to which so many have lately fallen victims. With reference to eight fatal cases of fever which took place in the Jail Hospital during the months of September and October, it is reported by Dr. Ross, then Civil Surgeon, that "no lesions were observed in the intestines except in one case," regarding which the following remarks were recorded in the post mortem book. "General inflammatory symptoms throughout intestines; glands injected and intestines filled with gelatinous fluid. This case is a typical one of gradual decline, diarrhoea following malarious fever in a weekly subject." The only available information regarding the morbid appearances seen in the autopsies of the other seven cases are that no ulcers in the intestines were found.

8. Different causes came into operation at different periods of the epidemic. At a comparatively early period of the out-break, when the fever producing influence may be supposed to have been in its most intense form, the severe remittent type of fever was fatally prevalent, many people it is said, having died from it after a few days' illness. At a later period when the evaporation began to decline the rapidly fatal form became less prevalent, the daily number of deaths from fever falling from 220 to 110 in the course of nine days. The fever death-rate would probably have, now fallen to a much lower level, had not other causes tending to swell it begun to have effect. Old cases now began to die off; great numbers of people with constitutions shattered by prolonged fever, never having recourse to appropriate treatment, without food such as a stomach weakened by disease could digest, gradually got weaker and weaker until the disease assuming a typhoid type ended in death. The injurious effects of great alternations of temperature—hot days, alternating with cold dewy nights were superadded in October, especially during the latter half of the month, when bronchitis, pneumonia, diarrhoea and dysentery became frequent concomitants or sequela, and not unfrequently proved fatal. As has already been observed, the incidence of the disease was heaviest on the poorer classes, and especially on those inhabiting the Kashmiri portion of the city. The vast majority of this class, owing to their inability to earn money to buy food, were found to be in the most impoverished condition, and suffering as much from the effects of chronic starvation as from fever. Although the poor classes in all parts of the city, no doubt, suffered much from deficiency of food, no where did I see the results of poverty and chronic starvation so plainly manifest as amongst the Kashmiri Shawl-weavers. The soup kitchens established by the local authorities will no doubt relieve to a great extent, the wants of many suffering from the effects of deficiency of food, but it is to be feared that the benefits of the charity will not reach those most in need of it, those who, being still fever-stricken, are too weak to leave their beds, and are themselves unable to attend at the kitchens where the food is distributed. To relieve this class of sufferers, and thereby to lower the excessive death-rate still obtaining amongst them, it would be necessary to arrange for the regular distribution of food at their own houses.

Another cause which has materially tended to swell the death-rate from fever is unsuitable and deficient clothing; and this evil is much aggravated by the custom so many have of sleeping on the ground with, as a rule, only a thin cotton sheet pulled over them, and a mat intervening between their bodies and the cold damp floor. Infants and children, who are peculiarly liable to suffer from the injurious effects of chill, are also very inadequately protected by clothing against extremes of temperature; the only garment in the case of the former is a cotton cloth of scanty dimensions wrapped round the body, while that of the latter in many cases consists of little more than a cotton shirt, barely reaching as far as the knees, the legs being left unprotected. Overcrowding and impure air have also played no unimportant part, not only in lessening the chances of recovery from the disease, but also in predisposing to its attacks. In some of the houses of the poorer people visited by me, where whole families were, or had at one time been, suffering from fever, the cubic space was found to be miserably small; and ventilation being practically in abeyance, the air, tainted with exhalations from the bodies of the sick and animal odours of all kinds was exceedingly foul and quite unfit for human beings to breathe. I would here by way of illustration give a typical instance of the kind of dwellings here alluded to: an apartment with a capacity of 1040 cubic feet occupied by eight persons, being 130 cubic feet per head, half the amount of cubic space per head in the crowded room of an English artizan.

The only means of renewing the air was through a small door way, inefficient at the best; but when this, according to custom, was closed at night the state of the air in the room with eight persons sleeping in it, must have become inexpressibly fetid and unwholesome.



August. September. October.
 AMRITSAR 1881. FEVER DIAGRAM. (DAILY DEATHS FROM FEVER.)

(Copy of Report 1907-1908)

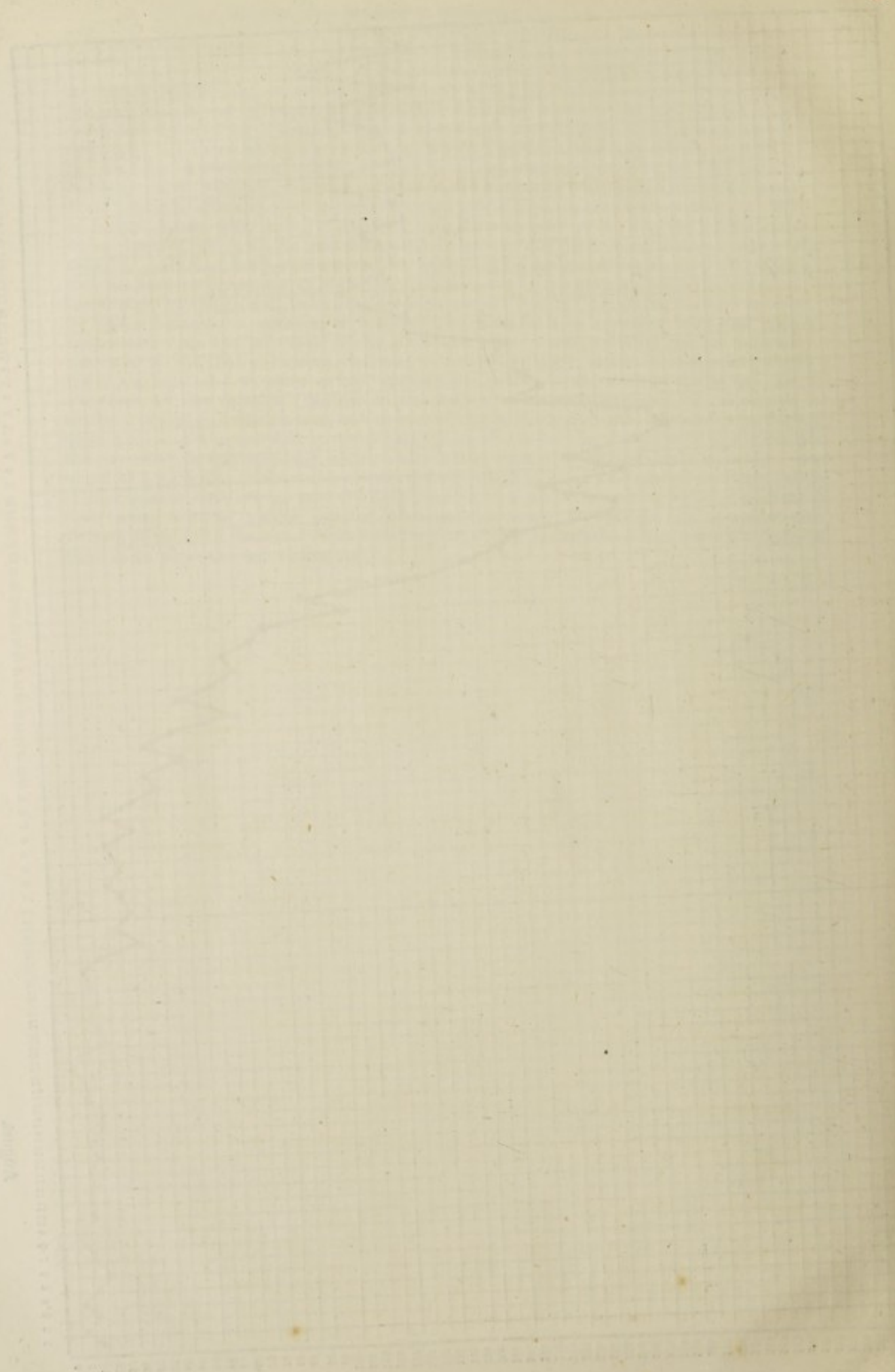
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APPENDIX D.

LAHORE CONSERVANCY.

Copy of a letter No. 1661, dated 23rd April 1881, from F. CUNNINGHAM, ESQ., Officiating Secretary to Government, Punjab, to SURGEON-MAJOR H. W. BELLEW, C. S. I., Sanitary Commissioner, Punjab.

I am directed to forward copy of a letter No. 1263 of the 19th instant, with enclosures, from the Commissioner of Lahore, reporting the measures which have been taken, and are in contemplation, for the improvement of the conservancy of the Lahore city, and to express the satisfaction with which the Hon'ble the Lieutenant-Governor has heard of the vigorous action which has been taken by the Deputy Commissioner and Municipal Committee. Great credit is due to the gentlemen who served on the Sub-Committee for the carefully considered scheme of city and station conservancy which they have drawn up.

Copy of a letter No. 1263, dated 19th April 1881, from the Commissioner and Superintendent, Lahore Division, to the Secretary to Government, Punjab.

In continuation of my No. 3615, dated 24th December, I have now the honor to forward copy of a report from Colonel C. Beadon, Deputy Commissioner of Lahore, with enclosure, reporting the measures taken, and those about to be taken to improve the conservancy of the Lahore city. It appears to me that this important matter has now been taken vigorously in hand by the Municipality, and I have every hope that in a few months I shall be able to report that the conservancy arrangements are working well.

2. Colonel Beadon has resolved that no effort shall be spared in removing the reproach of bad conservancy from Lahore, and I have myself lost no opportunity of impressing upon him and upon individual members of the Committee, the importance which the Government attaches to the matter.

Copy of a letter No. 268, dated the 12th April 1881, from COLONEL C. BEADON, Deputy Commissioner and President, Municipal Committee, Lahore, to G. R. ELSMIE, ESQ., Commissioner and Superintendent Lahore Division.

With reference to your Nos. 778—3089 and 905—3614, dated 3rd November and 24th December 1880, respectively, I have the honor to submit the following brief report on the subject of conservancy arrangements of Lahore.

2. On receipt of your letters quoted above a Sub-Committee, presided over by Mr. Lightfoot, was appointed to consider the matter and submit a report.

3. This Sub-Committee, after careful enquiry and several meetings, submitted a report, a printed copy of which is herewith forwarded for the information of the Government.

4. The report of the Sub-Committee was laid before a special meeting of the general Committee convened on the 16th March 1881, and after due consideration most of the proposals of the Sub-Committee were accepted, as per copy of the proceedings herewith attached.

5. The conservancy arrangements of the city, including Landa Bazár, have been divided into nine sections. Members of the Municipality are now held responsible for the cleanliness of the sections they represent.

6. In compliance with the wishes of His Honor the Lieutenant-Governor contained in para. 9 of Government letter No. 2980, dated 6th September 1880, the contract for the removal of filth from the city, including Landa Bazár, Anárkali and Mozang, has been given to a person named Imam Bakhsh, a man not interested in the continuance of the Moafidari system, and the custom, *i. e.*, the new contract of 1880, allowing the zamindars to remove filth without any payment has been entirely stopped.

7. Taking into consideration that the demand for manure will probably rise in future, the above contract has been given for a term of three years only, for which period the contractor will pay to the Municipality a sum of Rs. 10,500.

8. The Conservancy Establishment of both the City and Anárkali has been revised, effecting a saving of Rs. 9,930 per annum by reducing cart or other superfluous establishment. This saving, plus Rs. 3,000 on account of improved income from slaughter-houses, and Rs. 3,500 obtainable from the sale of manure, will aggregate Rs. 16,430 per annum, and the result will be a net charge of Rs. 10,956 against the head of conservancy, as compared with an average of Rs. 45,046 for the past three years.

9. The system of conservancy now undertaken has the recommendation of being very much cheaper than that which has been abandoned, and I am very hopeful that it will work well and secure satisfactory results in connection with the sanitary improvements of Lahore.

10. With reference to Sanitary Commissioner's remarks on the bad condition of the city streets and drains, I have to add that a plan and estimate for constructing gutter drains and metalling roads of the city have been forwarded to the Secretary to Government, Punjab, Department Public Works, with this office No. 250, dated 5th April 1881.

11. Due measures will be taken for improving the condition of the latrines condemned by the Sanitary Commissioner. I shall report later on on the working of the contract systems. So far matters are going along smoothly, and the Moafidars have apparently yielded to the efforts of the contractor, the Committee and myself. I think that the Committee is now acting properly and is endeavouring to retrieve the good will of Government.

Proceedings at a special meeting of the Lahore Municipal Committee, held at the Deputy Commissioner's Kacheri, on Wednesday the 16th March 1881, at 11-30 A. M.

PRESENT :

Colonel C. Beadon, *Deputy Commissioner and President.*

E. B. Francis, Esq., *Judicial Assistant and Secretary.*

Dr. J. Fairweather, *Civil Surgeon* ...

T. Bliss, Esq. ...

Rai Kanhya Lal, Bahadur ...

Khan Bahadur Barkat Ali Khan ...

Nawab Abdul Majid Khan ...

Rai Mul Singh ...

Sheikh Sandhey Khan ...

Fakir Kamr-ud-din ...

Pandit Rikhi Kesh ...

Lala Bhagwan Das ...

Lala Durga Parshad ...

Lala Thakar Das ...

Lala Bhawani Das ...

Munshi Harsukh Rai ...

Bhai Mian Singh ...

Mian Karim Bakhsh ...

Mallak Bassu ...

Sheikh Nanak Bakhsh ...

Members.

Sub-Committee's report on the conservancy arrangements of Lahore was read, and the following resolutions passed :—

I.—Increase of sweepers and bhistis.—Resolved that instead of increasing the number of Municipal sweepers, a small fee of 8 annas to 1 rupee per month be given to selected private sweepers to do public work within limits assigned to them.

Also that the increase of bhistis be deferred until the result of the new water-supply has been seen.

II.—Increased supervision.—The Sub-Committee's proposals were approved. Jamadars will be appointed, and sweeper-mates dispensed with.

III.—Responsibility of section members.—Resolved that the Sub-Committee's recommendation be acted upon.

IV.—Receptacles for filth.—Resolved that consideration of this proposal be deferred till it be seen how the new contract system for removal of filth works.

V.—Manure godowns within city walls.—Considered that these will not be necessary under the contract system.

VI.—Receptacles in compounds.—Resolved that the Bye-law on this subject be enforced. But no solid matter can be thrown into the out-fall sewer as suggested by Sub-Committee.

VII.—*Anarkali establishment.*—The whole of the Sub-Committee's proposals were approved.

VIII.—*Sweepers and bhistis employed at Government offices.*—Resolved that the President and Secretary take this matter into consideration.

IX.—*Use of iron trays as at Simla.*—Resolved that large trays be tried experimentally in the Anarkali latrines.

X.—*Latrine at Killa Gujar Singh.*—Resolved that portable latrines be tried here on the Jullundur system.

XI.—*Revision of establishment.*—President's revised schedule by which the conservancy establishment will cost Rs. 27,456 instead of Rs. 37,386, and the Committee will begin to receive an income from sale of manure and slaughter-houses amounting to Rs. 16,500, being a net expenditure of Rs. 10,956, and a saving of Rs. 16,430 per annum was unanimously approved, and the President and Secretary authorized to make the necessary change.

XII.—*Tender for contract of removal of night soil and city sweepings were laid before the Committee.*—Resolved that as the demand will probably rise in future years, Imam Bakhsh's tender for three years paying the Committee Rs. 10,500 be accepted on approved security.

Copy of a letter No. 729, dated 6th May 1881, from the Sanitary Commissioner, Punjab, to the Officiating Secretary to Government, Punjab.

In acknowledging the receipt of your Home No. 1661 of 23rd ultimo forwarding copy of a letter No. 1263 of the 19th April, with enclosures, from the Commissioner of Lahore regarding the improvement of the conservancy of the Lahore city, and expressing the satisfaction with which the Hon'ble the Lieutenant-Governor has heard of the vigorous action which has been taken by the Deputy Commissioner and Municipal Committee, I have the honor to state that after careful perusal of these papers, I am of opinion that a fair start has now been made towards putting the conservancy management of the Lahore city upon a sound and satisfactory footing.

2. I have not seen the plan and estimate for gutter drains and metalling roads of the city mentioned in para 10 of the Deputy Commissioner's letter above quoted, but presume that it includes the drainage of Anarkali and Landa Bazar. The surface gutters of both these quarters should, in my opinion, be connected with the city system through an intercepting sewer emptying into the main out-fall drain. And I think the Municipality might easily realize a handsome income by the sale of the liquid sewage carried in this out-fall channel, as is done at Amritsar, by allowing it to be used for field irrigation through "Jhalars" or irrigation water wheels constructed at fixed intervals along the course of the drain. I believe the cultivators would gladly avail themselves of this kind of manure, and pay for it as freely as do those of Amritsar.

3. With reference to the Proceedings of the special meeting of the Lahore Municipal Committee, held on the 16th March, para. IV. "Receptacles for filth." I shall be glad to hear that these useful contrivances (of the Delhi and Amritsar patterns) have again received the early and favorable consideration of the Municipal Committee. They should be simply bottomless boxes of the dimensions mentioned in the report of the Sub-Committee, and should be expressly for the temporary reception and concealment of dry ordure, garbage, sweepings, &c., and on no account should any liquid matter be thrown into them. All liquid sewage, slops, &c., should be discharged into the surface gutters, and should always, as much as possible, be kept separate from the dry sewage materials. These last, as is now done, should be removed by hand, and the sweeper's fitness should be judged by the thoroughness of the manner in which he removes these dry refuse matters. The more carefully the dry is separated from the liquid sewage, the more complete will be the conservancy. The filth boxes should be movable from place to place, but it would be most convenient to have fixed sites for them in out of the way corners of the several mohallas. Their use would greatly facilitate the scavenging of the streets by giving the sweepers a ready place to deposit their sweepings from time to time till the carts or donkeys came for its removal from the boxes.

4. With reference to para. X. "Latrine at Gujar Singh." I am of opinion that the portable latrine as used at Jullundur will be found more popular than any of the other forms of latrine here, and would advocate their introduction in the suburbs of the city where cultivation is brought close up to the walls.

5. The arrangements now made by the Municipal Committee are very encouraging and promise a radical and real improvement in the conservancy of this important city. It is to be hoped that the amount now realized as a first start by the sale of the town sweepings (given on contract for the next 3 years at Rs. 3,500 a year) is only a small index to the amount that will be hereafter realized from this source. If the Municipal Committee will consider their city sweepings, &c., as a valuable marketable commodity (which the stuff really is, either as manure or kiln fuel) and monopolize its sale, they may easily realize a yearly income quite equal to that derived from this source by Amritsar.

- XVI—London Convention—The whole of the London Convention's proposals were approved.
- XVII—London Convention and British Committee of Government Affairs—The London Convention and British Committee of Government Affairs were approved.
- XVIII—London Convention and British Committee of Government Affairs—The London Convention and British Committee of Government Affairs were approved.
- XIX—London Convention and British Committee of Government Affairs—The London Convention and British Committee of Government Affairs were approved.
- XX—London Convention and British Committee of Government Affairs—The London Convention and British Committee of Government Affairs were approved.
- XXI—London Convention and British Committee of Government Affairs—The London Convention and British Committee of Government Affairs were approved.
- XXII—London Convention and British Committee of Government Affairs—The London Convention and British Committee of Government Affairs were approved.

Copy of a letter No. 123, dated 21st May 1911, from the London Convention, London, to the London Convention, London.

In acknowledging the receipt of your letter No. 123 of 21st May 1911, I am glad to hear that the London Convention has been successful in its efforts to secure the approval of the London Convention and British Committee of Government Affairs to the proposals of the London Convention and British Committee of Government Affairs.

I have not seen the printed minutes for either dinner and reception which took place on the 19th of the month. The London Convention's letter shows that the London Convention and British Committee of Government Affairs have been successful in their efforts to secure the approval of the London Convention and British Committee of Government Affairs to the proposals of the London Convention and British Committee of Government Affairs.

With reference to the London Convention's proposals, I am glad to hear that the London Convention and British Committee of Government Affairs have been successful in their efforts to secure the approval of the London Convention and British Committee of Government Affairs to the proposals of the London Convention and British Committee of Government Affairs.

With reference to your letter No. 123 of 21st May 1911, I am glad to hear that the London Convention and British Committee of Government Affairs have been successful in their efforts to secure the approval of the London Convention and British Committee of Government Affairs to the proposals of the London Convention and British Committee of Government Affairs.

The arrangements now made by the London Convention and British Committee of Government Affairs are very satisfactory and I am glad to hear that the London Convention and British Committee of Government Affairs have been successful in their efforts to secure the approval of the London Convention and British Committee of Government Affairs to the proposals of the London Convention and British Committee of Government Affairs.

VITAL STATISTICS

OF THE

GENERAL POPULATION, 1881.

BIRTHS REGISTERED in the DISTRICTS of the PUNJAB during the year 1881.

1 Number.	2 DISTRICTS.	3 Population according to Census of 1868.	4 Number of births registered.			5 Ratio of births per 1,000 of population.			6 Number of males born to every 100 females born.	7 Excess of births over deaths per 1,000 of population.	8 Excess of deaths over births per 1,000 of population.
			Males.	Females.	Total.	Males.	Females.	Total.			
DELHI DIVISION.											
1	Delhi	608,850	15,842	13,704	29,546	26·02	22·51	48·53	115·60	10	...
2	Gurgaon	696,646	15,024	12,763	27,787	21·57	18·32	39·89	117·71	11	...
3	Karnál	610,927	14,251	11,985	26,236	23·33	19·62	42·94	118·91	7	...
HISSAR DIVISION.											
4	Hissar	484,681	10,395	8,937	19,332	21·45	18·44	39·89	116·31	13	...
5	Rohtak	536,959	13,357	11,064	25,021	24·87	21·72	46·60	114·51	16	...
6	Sirsa	210,795	4,477	3,803	8,280	21·24	18·04	39·28	117·72	11	...
UMBALLA DIVISION.											
7	Umballa	1,008,860	20,319	17,515	37,834	20·14	17·36	37·50	116·01	3	...
8	Ladhiana	583,245	12,901	11,117	24,018	22·12	19·06	41·18	116·05	11	...
9	Simla	33,594	286	246	532	8·51	7·32	15·84	116·26	...	6
JULLUNDUR DIVISION.											
10	Jullundur	783,020	17,448	16,042	33,490	22·28	20·49	42·77	108·76	13	...
11	Hoshiárpur	938,890	21,161	19,054	40,215	22·54	20·29	42·83	111·06	12	...
12	Kángra	743,758	10,569	9,485	20,054	14·21	12·75	26·96	111·43	...	2
AMRITSAR DIVISION.											
13	Amritsar	832,750	20,832	18,461	39,293	25·01	22·17	47·18	112·84	...	3
14	Gurdáspur	906,126	20,516	18,149	38,665	22·64	20·03	42·67	113·04	14	...
15	Siálkot	994,458	23,349	20,337	43,686	23·48	20·45	43·93	114·81	16	...
LAHORE DIVISION.											
16	Lahore	775,551	20,422	17,559	37,981	26·33	22·64	48·97	116·30	8	...
17	Gujránwála	550,576	12,994	11,069	24,063	23·60	20·10	43·70	117·39	18	...
18	Ferozepore	533,416	12,358	10,750	23,108	23·17	20·15	43·32	114·96	13	...
RAWALPINDI DIVN.											
19	Rawalpindi	699,647	14,882	12,220	27,102	21·27	17·46	38·74	121·78	14	...
20	Jhelum	500,988	10,497	9,238	19,735	20·95	18·44	39·39	113·63	15	...
21	Gujrat	616,347	13,979	12,121	26,100	22·68	19·66	42·35	115·32	21	...
22	Shahpur	368,796	8,054	7,282	15,336	21·84	19·74	41·58	110·60	19	...
MOOLTAN DIVISION.											
23	Mooltan	459,765	9,481	7,884	17,365	20·62	17·15	37·77	120·26	6	...
24	Jhang	348,027	6,658	5,712	12,370	19·13	16·41	35·54	116·52	17	...
25	Montgomery	359,437	7,487	6,533	14,020	20·83	18·17	39·00	114·60	11	...
26	Muzaffargarh	295,547	7,461	6,569	14,030	25·24	22·23	47·47	113·58	16	...
DERAJAT DIVISION.											
27	Dera Ismail Khan	394,864	6,549	5,020	11,569	16·58	12·73	29·30	130·46	7	...
28	Dera Gházi Khan	309,978	4,693	3,373	8,066	15·14	10·88	26·02	139·13	8	...
29	Bannu	287,547	4,407	3,176	7,583	15·33	11·04	26·37	138·76	5	...
PESHAWAR DIVISION.											
30	Pesháwar	500,443	5,917	3,364	9,281	11·82	6·72	18·54	175·89	...	6
31	Hazára	367,218	6,222	4,856	11,078	16·94	13·22	30·17	128·13	10	...
32	Kohát	145,419	1,811	1,179	2,990	12·45	8·11	20·56	153·60	1	...
	Total	17,487,125	374,599	321,167	695,766	21·42	18·36	39·79	116·64	10	...

DEATHS REGISTERED in the DISTRICTS of the PUNJAB during the year 1881.

1 Number.	2 DISTRICTS.	3 Population according to Census of 1868.	4 Area in square miles.*	5 Average population per square mile.	6 Number of deaths registered.			7 No. of male died to every 100 deaths of females.	8 Ratio of deaths per 1,000 of population.			9 Mean ratio of deaths per 1,000 during previous 5 years.		
					Males.	Females.	Total.		Males.	Females.	Total.	Males.	Females.	Total.
DELHI DIVISION.														
1	Delhi	608,850	1,258	406	12,452	10,570	23,022	117·80	38	37	38	42	41	41
2	Gurgaon	696,646	1,938	348	10,768	9,177	19,945	117·34	29	28	29	43	41	42
3	Karnal	610,927	2,306	264	12,203	9,788	21,991	124·67	37	35	36	38	35	37
HISSAR DIVISION.														
4	Hissar	484,681	3,540	137	7,124	5,772	12,896	123·42	27	26	27	22	22	22
5	Rohtak	536,959	1,811	295	9,399	7,315	16,714	128·49	32	30	31	34	33	33
6	Sirsa	210,795	3,116	68	3,200	2,782	5,982	115·02	27	30	28	24	25	25
UMBALLA DIVN.														
7	Umballa	1,008,860	2,570	394	18,568	15,700	34,268	118·27	34	34	34	30	28	29
8	Ludhiána	583,245	1,375	429	9,471	8,244	17,715	114·88	30	31	30	31	31	31
9	Simla	33,594	18	1,888	461	266	727	173·31	21	23	22	20	23	22
JULLUNDUR DIVN.														
10	Jullundur	783,020	1,322	596	12,113	11,330	23,443	106·91	28	32	30	41	45	43
11	Hoshiárpur	938,890	2,180	450	15,112	13,714	28,826	110·19	30	31	31	34	34	35
12	Kángra	743,758	8,389	87	11,530	10,138	21,668	113·73	29	29	29	27	26	27
AMRITSAR DIVN.														
13	Amritsar	832,750	1,573	535	21,662	20,434	42,096	106·01	46	55	50	36	38	37
14	Gurdáspur	906,126	1,822	496	13,789	12,677	26,466	108·77	27	31	29	30	30	30
15	Sialkot	994,458	1,958	510	15,176	13,203	28,379	114·94	28	29	28	26	25	25
LAHORE DIVISION.														
16	Lahore	775,551	3,648	218	16,975	14,626	31,601	116·06	40	42	41	36	36	36
17	Gujránwála	550,576	2,587	207	7,589	6,585	14,174	115·25	25	27	26	31	34	32
18	Ferozepore	533,416	2,744	204	8,529	7,789	16,318	109·50	29	32	30	27	25	26
RAWALPINDI DIVISION.														
19	Rawalpindi	699,647	6,218	114	9,803	7,930	17,733	123·62	26	24	25	36	34	35
20	Jhelum	500,988	3,910	128	6,309	5,516	11,825	114·38	24	23	24	28	27	28
21	Gujrát	616,347	1,973	324	6,902	5,966	12,868	115·69	21	21	21	26	25	26
22	Shahpur	368,796	4,691	78	4,527	3,745	8,272	120·88	23	22	22	28	27	27
MOOLTAN DIVN.														
23	Mooltan	459,765	5,880	80	8,096	6,748	14,844	119·98	32	32	32	26	24	26
24	Jhang	348,027	5,702	61	3,470	3,000	6,470	115·67	18	19	18	15	14	15
25	Montgomery	359,437	5,574	64	5,369	4,579	9,948	117·25	27	29	28	23	23	23
26	Muzaffargarh	295,547	3,136	98	4,932	4,131	9,063	119·39	30	31	31	27	26	26
DERAJAT DIVISION.														
27	Dera Ismail Khan... ..	394,864	9,296	56	4,807	3,819	8,626	125·87	22	21	22	23	22	23
28	Dera Ghazi Khan	309,978	4,377	118	3,071	2,422	5,493	126·80	18	17	18	17	15	16
29	Bannu	287,547	3,831	91	3,528	2,664	6,192	132·43	23	20	21	23	21	22
PESHAWAR DIVN.														
30	Pesháwar	500,443	2,504	271	6,772	5,461	12,233	124·01	25	23	24	19	17	19
31	Hazára	367,218	2,835	122	3,964	3,254	7,218	121·62	21	18	20	21	17	19
32	Kohát	145,419	2,838	52	1,603	1,160	2,763	138·19	20	17	19	15	12	13
Total for the Province ...		17,487,125	107,010	173	2,79,274	2,40,505	5,19,779	116·12	29	30	30	30	30	30

* NOTE.—The figures in column 4 have been taken from the Punjab Administration Report for 1879-80.

DEATHS REGISTERED in the DISTRICTS of the PUNJAB during each month of the year 1881.

1 Number.	2 Districts.	3												4 Total Deaths registered during the year.	5 Number.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
DELHI DIVISION.															
1	Delhi	1,718	1,694	1,639	1,934	1,733	1,815	1,459	1,184	1,794	2,619	2,594	2,839	23,022	1
2	Gurgaon	1,529	1,535	1,478	1,548	1,074	1,064	961	866	1,696	2,986	2,580	2,628	19,945	2
3	Karnal	1,718	1,900	1,665	1,958	1,467	1,525	1,431	1,280	2,370	1,992	2,140	2,545	21,991	3
HISSAR DIVISION.															
4	Hissar	946	926	934	1,060	1,137	1,002	904	782	1,492	1,578	1,105	1,030	12,896	4
5	Rohtak	1,319	1,220	1,124	1,329	1,141	1,150	1,008	920	1,618	2,191	1,860	1,834	16,714	5
6	Sirsa	384	461	531	535	543	442	378	352	641	682	556	477	5,982	6
UMBALLA DIVISION.															
7	Umballa	2,556	2,548	2,250	2,527	1,798	1,946	2,010	1,797	4,023	5,115	3,816	3,882	34,268	7
8	Ludhiána	1,360	1,203	954	975	1,106	990	978	1,223	2,438	2,947	2,107	1,434	17,715	8
9	Simla	49	45	42	70	49	62	71	65	72	87	60	55	727	9
JULLUNDUR DIVISION.															
10	Jullundur	1,906	1,601	1,353	1,167	1,260	1,121	1,085	2,051	2,904	3,761	3,053	2,181	23,443	10
11	Hoshiárpur	1,956	1,990	1,946	1,472	1,568	1,571	1,289	1,660	3,865	5,275	3,655	2,579	28,826	11
12	Kángra	1,842	1,619	1,586	1,315	1,426	1,553	1,170	1,425	2,281	3,020	2,132	2,299	21,668	12
AMRITSAR DIVISION.															
13	Amritsar	2,081	1,534	1,592	1,244	1,840	1,836	1,480	2,059	5,882	10,278	8,141	4,129	42,096	13
14	Gurdáspur	2,022	1,611	1,255	973	1,420	1,271	1,167	1,313	3,135	5,335	4,110	2,854	26,466	14
15	Siálkot	2,160	1,527	1,279	1,079	1,750	1,426	1,352	1,572	3,345	5,251	4,505	3,133	28,379	15
LAHORE DIVISION.															
16	Lahore	2,429	1,879	1,554	1,402	1,639	1,670	1,464	3,178	3,538	4,801	4,614	3,433	31,601	16
17	Gujránwála	1,406	1,172	860	777	1,018	1,013	863	1,110	1,537	1,601	1,530	1,287	14,174	17
18	Ferozepore	1,170	1,112	1,005	919	1,043	959	895	1,097	1,909	2,569	2,120	1,520	16,318	18
RAWALPINDI DIVISION.															
19	Rawalpindi	2,117	1,606	1,603	1,152	1,149	1,128	1,073	1,151	1,382	1,734	1,727	1,821	17,733	19
20	Jhelum	1,153	957	935	828	806	806	956	817	990	1,317	1,035	1,225	11,825	20
21	Gujrat	1,431	987	750	817	826	891	914	877	1,277	1,504	1,294	1,300	12,868	21
22	Shahpur	714	724	621	579	693	704	621	599	660	693	838	826	8,272	22
MOOLTAN DIVISION.															
23	Mooltan	1,520	1,238	1,036	1,117	962	857	835	697	855	1,705	1,854	2,168	14,844	23
24	Jhang	624	595	544	434	564	454	481	404	468	574	661	667	6,470	24
25	Montgomery	857	690	626	523	622	597	530	475	607	1,291	1,687	1,443	9,948	25
26	Muzaffargarh	826	810	815	677	682	589	478	454	605	948	1,229	950	9,063	26
DERAJAT DIVISION.															
27	Dera Ismail Khan	1,135	1,015	809	851	760	663	584	359	420	524	608	898	8,626	27
28	Dera Gházi Khan	528	479	468	478	373	338	389	278	387	568	530	647	5,493	28
29	Bannu	732	662	533	474	506	525	420	315	355	466	547	657	6,192	29
PESHAWAR DIVISION.															
30	Pesháwar	1,187	1,264	1,111	1,117	974	963	988	545	655	1,040	1,084	1,305	12,233	30
31	Hazára	801	736	667	564	503	525	454	425	536	638	504	865	7,218	31
32	Kohát	325	286	277	243	168	206	150	146	184	228	239	311	2,763	32
Total for the Province ...		42,501	37,710	33,872	32,138	32,600	31,662	28,838	31,476	53,921	75,318	64,515	55,222	5,19,779	
Ratio of deaths per 1,000 in each month ...		2.43	2.10	1.94	1.84	1.86	1.81	1.65	1.80	3.08	4.31	3.69	3.16	29.72	

DEATHS REGISTERED according to age in the DISTRICTS of the

1 Number.	2 DISTRICTS.	3		4		5		6	
		Under 1 year.		One year and under 6.		6 and under 12.		12 and under 20.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
DELHI DIVISION.									
1	Delhi	2,847	2,213	2,253	1,947	612	542	559	480
2	Gurgaon	2,672	2,270	1,270	1,068	475	415	469	342
3	Karnál	3,325	2,451	1,723	1,342	577	490	522	393
HISSAR DIVISION.									
4	Hissar	1,818	1,379	1,319	1,080	303	291	254	209
5	Rohtak	2,868	2,150	1,493	1,146	408	347	310	229
6	Sirsa	731	670	584	568	137	132	134	129
UMBALLA DIVISION.									
7	Umballa	4,734	4,165	2,808	2,526	887	707	693	546
8	Ludhiána	2,976	2,723	1,878	1,569	439	389	325	280
9	Simla	87	52	40	18	8	3	25	20
JULLUNDUR DIVISION.									
10	Jullundur	3,863	3,857	2,169	2,211	551	514	439	378
11	Hoshiárpur	5,010	4,672	2,535	2,385	676	622	528	488
12	Kángra	2,495	2,169	1,216	1,266	622	633	638	660
AMRITSAR DIVISION.									
13	Amritsar	5,826	5,872	5,232	5,007	1,048	1,018	757	814
14	Gurdáspur	4,345	3,946	2,406	2,552	574	573	529	482
15	Siálkot	4,844	4,279	3,545	3,344	692	567	412	383
LAHORE DIVISION.									
16	Lahore	4,774	4,325	3,585	3,324	763	654	656	671
17	Gujránwála	2,302	2,054	1,515	1,443	363	301	223	242
18	Ferozepore	2,531	2,568	1,938	1,705	414	367	311	340
RAWALPINDI DIVISION.									
19	Rawalpindi	2,613	2,088	1,184	1,022	473	415	443	388
20	Jhelum	1,841	1,653	1,026	1,062	326	261	255	211
21	Gujrat	2,078	1,817	1,346	1,257	290	283	208	207
22	Shahpur	1,577	1,245	748	614	192	185	99	134
MOOLTAN DIVISION.									
23	Mooltan	2,241	1,908	1,222	1,152	311	285	251	230
24	Jhang	1,072	1,064	483	426	159	132	98	82
25	Montgomery	1,573	1,425	1,048	1,008	257	177	149	148
26	Muzaffargarh	1,657	1,397	731	584	179	178	149	126
DERAJAT DIVISION.									
27	Dera Ismail Khan	1,177	942	908	845	331	251	231	136
28	Dera Gházi Khan	746	523	626	502	215	161	117	106
29	Bannu	846	638	686	562	225	159	116	107
PESHAWAR DIVISION.									
30	Pesháwar	1,015	664	1,461	1,287	400	315	292	326
31	Hazára	820	610	582	527	268	220	169	163
32	Kohát	268	177	297	227	93	91	92	49
Total for the Province ...		77,572	67,966	49,857	45,576	13,268	11,678	10,453	9,499
Ratio per 1,000 living ...		8.16	8.52	5.24	5.71	1.39	1.46	1.10	1.19

PUNJAB during the year 1881.

7		8		9		10		11		12
20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Number.
999	958	966	924	1,161	914	1,179	889	1,876	1,703	1
1,063	933	933	993	1,060	864	1,208	898	1,618	1,394	2
1,033	947	1,033	927	1,181	903	1,137	857	1,672	1,478	3
516	531	471	457	641	414	644	423	1,158	988	4
636	582	624	563	817	575	894	559	1,349	1,164	5
247	217	208	185	244	205	303	173	612	503	6
1,362	1,253	1,309	1,237	1,752	1,273	1,653	1,173	3,280	2,820	7
544	565	432	445	567	508	756	525	1,554	1,240	8
41	39	56	32	60	27	57	22	87	53	9
698	761	699	752	919	679	1,000	678	1,775	1,500	10
840	939	880	854	1,095	821	1,119	768	2,429	2,165	11
1,026	1,197	945	886	1,265	876	1,084	643	2,239	1,808	12
1,373	1,475	1,309	1,141	1,516	1,170	1,488	1,099	3,113	2,838	13
944	1,000	876	785	1,144	848	1,007	739	1,964	1,692	14
593	708	669	639	870	629	906	600	2,645	2,054	15
1,012	1,091	1,079	757	1,230	829	1,188	743	2,688	2,232	16
320	306	326	310	477	335	505	327	1,558	1,267	17
421	487	379	399	481	375	647	370	1,407	1,178	18
796	736	903	795	945	688	808	529	1,638	1,269	19
356	371	352	348	430	349	493	311	1,230	950	20
305	330	298	253	410	334	454	324	1,513	1,161	21
135	155	143	152	224	180	331	195	1,078	885	22
436	484	555	522	786	563	682	415	1,612	1,189	23
117	148	148	135	198	186	292	192	903	635	24
213	254	255	240	357	293	371	237	1,146	797	25
251	281	344	334	437	330	407	242	777	659	26
252	275	324	244	393	305	353	228	838	593	27
171	201	211	219	266	170	211	132	508	408	28
212	153	257	197	326	206	277	222	583	420	29
498	543	668	536	755	533	566	398	1,117	859	30
325	300	381	383	405	299	314	217	700	535	31
146	103	185	98	168	127	147	102	297	186	32
17,881	18,333	18,308	16,742	22,580	16,808	22,481	15,230	46,874	38,623	
1·88	2·30	1·92	2·10	2·37	2·11	2·36	1·91	4·93	4·84	

DEATHS REGISTERED according to CLASSES in the DISTRICTS of the PUNJAB during the year 1881.

1 Number.	2 DISTRICTS.	3 POPULATION ACCORDING TO CENSUS OF 1868.					4 NUMBER OF DEATHS REGISTERED.					5 RATIO OF DEATHS PER 1,000 OF POPULATION.				
		Muhammadans.	Hindus.	Native Christians.	Other castes.	Total.	Muhammadans.	Hindus.	Native Christians.	Other castes.	Total.	Muhammadans.	Hindus.	Native Christians.	Other castes.	Total.
DELHI DIVISION.																
1	Delhi					5,623	14,661	27	2,711	23,022						
2	Gurgaon					6,777	10,077	...	3,091	19,945						
3	Karnál					5,589	13,126	...	3,276	21,991						
HISSAR DIVISION.																
4	Hissar					2,393	8,915	1	1,587	12,896						
5	Rohtak					2,258	12,208	...	2,248	16,714						
6	Sirsa					2,052	3,114	...	816	5,982						
UMBALLA DIVISION.																
7	Umballa					9,690	18,927	1	5,650	34,268						
8	Ludhiána					6,586	9,004	...	2,125	17,715						
9	Simla					145	395	4	183	727						
JULLUNDUR DIVISION.																
10	Jullundur					10,635	9,324	3	3,481	23,443						
11	Hoshiárpur					9,933	15,007	...	3,886	28,826						
12	Kángra					1,511	17,716	...	2,441	21,668						
AMRITSAR DIVISION.																
13	Amritsar					21,735	17,105	1	3,255	42,096						
14	Gurdáspur					13,019	10,493	...	2,954	26,466						
15	Siálkot					18,202	7,573	4	2,600	28,379						
LAHORE DIVISION.																
16	Lahore					In formation not available	20,565	8,375	6	2,655	31,601					In formation not available
17	Gujránwála					available	9,764	3,448	...	962	14,174					available
18	Ferozepore						7,472	7,018	...	1,823	16,318					
RAWALPINDI DIVISION.																
19	Rawalpindi						15,740	1,927	1	65	17,733					
20	Jhelam						10,395	1,414	1	15	11,825					
21	Gujrat						11,249	1,573	...	46	12,868					
22	Shahpur						6,806	1,342	...	124	8,272					
MOOLTAN DIVISION.																
23	Mooltan						11,985	2,580	...	279	14,844					
24	Jhung						5,014	1,294	...	162	6,470					
25	Montgomery						7,131	2,335	...	482	9,948					
26	Muzaffargarh						7,708	1,258	...	97	9,063					
DERAJAT DIVISION.																
27	Dera Ismail Khan						7,551	1,024	...	51	8,626					
28	Dera Gházi Khan						4,690	771	...	32	5,493					
29	Bannu						5,514	636	1	41	6,192					
PESHAWAR DIVISION.																
30	Pesháwar						11,627	541	...	65	12,233					
31	Hazára						6,848	349	...	21	7,218					
32	Kohát						2,576	152	1	34	2,763					
	Total						268,783	203,682	51	47,263	519,779					

DETAILED ACCOUNT OF THE WORK OF THE DISTRICT

No.	1907		1908		1909		Total
	Jan.	Dec.	Jan.	Dec.	Jan.	Dec.	
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DEATHS REGISTERED from different CAUSES in the DISTRICTS

Number.	2	3	4	5	6	7	INJU	
							Suicide.	
							Males.	Females.
A. DISTRICTS.								
DELHI DIVISION.								
1	Delhi	434,660	87	11	10,677	449	2	5
2	Gurgaon	636,779	5	80	13,830	513	12	30
3	Karnál	546,613	10	294	13,708	348	1	2
HISSAR DIVISION.								
4	Hissar	425,089	...	11	8,421	184	1	...
5	Rohtak	509,509	...	45	11,851	242	3	4
6	Sirsa	197,988	1	76	4,178	208	...	2
UMBALLA DIVISION.								
7	Umballa	936,992	73	540	23,668	998	6	4
8	Ludhiána	526,539	11	58	10,672	317	9	3
9	Simla	16,154	...	...	163	79	...	...
JULLUNDUR DIVISION.								
10	Jullundur	708,129	216	45	14,051	312	4	6
11	Hoshiárpur	911,781	196	40	18,491	835	10	14
12	Kángra	740,896	36	1	13,949	12,12	10	16
AMRITSAR DIVISION.								
13	Amritsar	696,584	95	43	17,238	399	5	8
14	Gurdáspur	876,942	72	31	16,947	745	3	5
15	Siálkot	961,469	102	15	18,934	646	3	9
LAHORE DIVISION.								
16	Lahore	630,317	444	79	16,399	389	6	3
17	Gujránwála	514,868	54	36	8,986	316	4	3
18	Ferozepore	518,248	23	70	10,672	370	6	6
RAWALPINDI DIVISION.								
19	Rawalpindi	670,906	54	21	12,442	1,145	...	1
20	Jhelum	474,272	13	8	7,194	834	3	...
21	Gujrát	584,932	2	5	7,795	317	2	...
22	Shahpur	354,086	1	25	4,229	388	2	...
MOOLTAN DIVISION.								
23	Mooltan	408,887	...	249	9,873	192	...	3
24	Jhang	322,410	...	60	3,581	177	2	...
25	Montgomery	359,437	5	148	7,070	184	2	3
26	Muzaffargarh	295,547	...	244	6,727	120	2	1
DERAJAT DIVISION.								
27	Dera Ismail Khan	369,579	...	1,227	5,276	192	4	1
28	Dera Gházi Khan	286,770	...	496	3,876	52	1	1
29	Bannu	284,323	...	568	4,134	257	1	3
PESHAWAR DIVISION.								
30	Pesháwar	440,049	3	1,481	6,992	135	1	...
31	Hazára	364,324	3	23	5,800	157	...	...
32	Kohát	129,166	6	316	1,594	62	...	...
Total of Districts		16,134,245	1,512	6,340	319,418	12,774	105	133

NOTE.—A. Districts in this Statement do not include

and TOWNS of the PUNJAB during the year 1881.

8			9	10	11								12
RIES.			All other causes.	Total deaths from all causes.	RATIO OF DEATHS PER 1,000 OF POPULATION.								Number.
Wounding or accidents.	Snake bite or killed by wild beasts.	Total.			Cholera.	Small-pox.	Fever.	Bowel complaints.	Injuries.	All other causes.	From all causes.		
											For the year.	Mean of previous five years.	
108	14	129	4,121	15,474	0.20	0.02	24.56	1.03	0.30	9.48	36	37	1
183	17	242	3,083	17,753	0.01	0.12	21.72	0.80	0.38	4.84	28	40	2
132	27	162	5,094	19,616	0.02	0.54	25.08	0.64	0.30	9.32	36	36	3
65	37	103	2,175	10,894	...	0.02	19.81	0.43	0.24	5.12	26	20	4
136	25	168	3,700	16,006	...	0.09	23.26	0.47	0.33	7.26	31	33	5
41	15	58	1,189	5,710	0.005	0.38	21.10	1.05	0.29	6.00	29	24	6
157	35	202	6,154	31,635	0.08	0.58	25.26	1.06	0.21	6.57	34	28	7
98	11	121	4,443	15,622	0.02	0.11	20.27	0.60	0.23	8.44	30	28	8
10	5	15	216	473	...	...	10.09	4.89	0.93	13.37	29	24	9
131	6	147	5,523	20,294	0.30	0.06	19.84	0.44	0.21	7.80	29	41	10
238	46	308	7,824	27,694	0.21	0.04	20.28	0.91	0.34	8.58	30	34	11
257	59	342	5,999	21,539	0.05	...	18.83	1.63	0.46	8.10	29	27	12
176	25	214	7,123	25,112	0.14	0.06	24.75	0.57	0.31	10.22	36	32	13
183	36	227	7,046	25,068	0.08	0.03	19.32	0.85	0.26	8.03	28	30	14
148	51	211	7,082	26,990	0.11	0.01	19.69	0.67	0.22	7.36	28	25	15
147	120	276	6,579	24,166	0.70	0.12	26.02	0.62	0.44	10.44	38	35	16
142	108	257	3,140	12,783	0.10	0.06	17.45	0.61	0.50	6.10	25	32	17
103	33	148	4,247	15,530	0.04	0.13	20.59	0.71	0.28	8.20	30	25	18
222	54	277	2,680	16,619	0.08	0.03	18.54	1.71	0.41	3.99	25	34	19
133	47	183	2,921	11,153	0.03	0.02	15.17	1.76	0.38	6.16	23	27	20
113	31	146	3,719	11,984	0.003	0.01	13.33	0.54	0.25	6.36	20	25	21
107	48	157	3,009	7,809	0.002	0.07	11.94	1.09	0.44	8.50	22	27	22
142	48	193	2,486	12,993	...	0.61	24.15	0.47	0.47	6.08	32	24	23
81	42	125	1,938	5,881	...	0.19	11.11	0.55	0.39	6.01	18	13	24
85	58	148	2,393	9,948	0.01	0.41	19.67	0.51	0.41	6.66	28	23	25
86	49	138	1,834	9,063	...	0.82	22.76	0.41	0.47	6.20	31	26	26
92	38	135	1,270	8,100	...	3.32	14.27	0.52	0.36	3.44	22	22	27
51	26	79	484	4,987	...	1.73	13.52	0.18	0.27	1.69	17	14	28
38	13	55	1,102	6,116	...	2.00	14.54	0.90	0.19	3.87	21	21	29
108	9	118	1,000	9,729	0.006	3.36	15.89	0.31	0.27	2.27	22	13	30
100	8	108	1,083	7,174	0.008	0.06	15.92	0.43	0.30	2.97	20	19	31
34	6	40	334	2,352	0.05	2.45	12.34	0.48	0.31	2.58	18	12	32
3,847	1,147	5,232	110,991	456,267	0.09	0.39	19.80	0.79	0.32	6.88	28	29	

the population and deaths of the principal Towns, Cantonments and Hill Sanitaria.

DEATHS REGISTERED from different CAUSES in the

1 Number.	2 B. TOWNS.	3 Population accord- ing to Census of 1875 and 1876.	4 Cholera.	5 Small-pox.	6 Fevers.	7 Bowel complaints.	8 Suicide.		9 Insu.
							Males.	Femals.	
DELHI DISTRICT.									
1	Delhi	1,15,992	10	55	3,563	107	1	...	...
2	Do. Suburbs	44,561	68	5	1,214	45	1	...	...
3	Sonepat	13,637	2	1	280	10	...	...	...
GURGAON DISTRICT.									
4	Farakhnagar	10,594	...	...	208	39	1	...	...
5	Rewári	25,190	...	1	331	96	...	...	...
6	Firozpur	10,530	...	...	247	41	...	...	...
7	Palwal	13,553	...	...	233	127	...	...	...
KARNAL DISTRICT.									
8	Karnál	24,015	1	39	420	113	...	...	...
9	Kaithal	15,799	...	5	165	107	...	...	...
10	Panipat	24,500	114	...	406	92	...	...	...
HISSAR DISTRICT.									
11	Hissar	14,162	...	...	234	32	1	...	...
12	Hánsi	12,210	...	2	243	19	...	...	...
13	Bhiwáni	33,220	...	2	402	142	...	...	...
ROHTAK DISTRICT.									
14	Rohtak	14,994	1	...	191	32	...	...	...
15	Jhajjar	12,456	...	6	148	22	...	...	...
SIRSA DISTRICT.									
16	Sirsa	12,807	...	...	191	18	...	...	...
UMBALLA DISTRICT.									
17	Umballa	26,258	125	15	492	129	...	...	...
18	Jagádhrí	12,522	2	2	180	36	...	...	...
19	Shahabad	11,660	12	11	161	28	...	...	...
20	Sádhaúra	11,167	...	4	166	12	...	...	...
21	Rápar	10,261	...	5	103	18	1	...	...
LUDHIANA DISTRICT.									
22	Ludhiana	40,385	10	3	853	110	1	...	...
23	Jagraon	16,321	...	...	234	92	...	...	...
JULLUNDUR DISTRICT.									
24	Jullundur	35,222	421	...	652	78	...	...	...
25	Do. Suburbs	15,702	172	...	197	25	...	...	...
26	Kartárpur	11,033	45	...	232	15	...	...	...
27	Ráhon	12,914	11	5	351	55	...	...	...
HOSHIARPUR DISTRICT.									
28	Hoshiárpur	13,138	134	...	148	103	...	...	...
29	Urmar Tánda	13,971	1	...	284	58	...	...	...
AMRITSAR DISTRICT.									
30	Amritsar	1,36,166	612	2	11,724	958	2	4	...
GURDASPUR DISTRICT.									
31	Batála	26,929	260	3	775	89	...	...	...
SIALKOT DISTRICT.									
32	Sialkot	32,989	211	1	381	185	...	...	...
LAHORE DISTRICT.									
33	Lahore	92,035	772	8	3,614	87	...	...	...
34	Do. Suburbs	36,406	329	1	731	177	1	...	...
35	Kasur	16,793	98	...	314	30	...	...	...
GUJRANWALA DISTRICT.									
36	Gujránwála	20,562	153	...	391	65	2	...	...
37	Wazirabad	15,346	54	...	274	36	1	...	...
FEROZEPURE DISTRICT.									
38	Ferozepore	15,168	...	...	535	48	1	...	...
RAWALPINDI DISTRICT.									
39	Rawalpindi	20,802	35	...	449	133	...	1	...
JHELUM DISTRICT.									
40	Jhelum	11,319	7	...	146	19	...	...	...
41	Pind Dádan Khan	15,397	...	3	155	106	...	...	...
GUJRAT DISTRICT.									
42	Gujrát	17,401	5	...	159	46	...	...	...
43	Jalápur	14,014	28	...	185	57	...	...	...
SHAHPUR DISTRICT.									
44	Bhera	14,710	...	...	209	59	...	...	...
MOOLTAN DISTRICT.									
45	Mooltan	29,448	...	...	388	127	1	...	...
46	Do. Suburbs	21,430	...	1	426	66	...	1	...
JHANG DISTRICT.									
47	Maghána	13,618	...	...	115	27	...	...	...
48	Chiniot	11,999	...	...	100	23	...	...	...
DERA ISMAIL KHAN DIST.									
49	Dera Ismail Khan	19,954	...	22	234	40	1	...	...
DERA GHAZI KHAN DIST.									
50	Dera Gházi Khan	19,133	...	11	250	19	...	...	...
PESHAWAR DIST.									
51	Pesháwar	58,430	...	143	1,304	171	...	...	...
KOHAT DIST.									
52	Kohat	11,043	...	41	172	22	...	...	...
Total of the Towns		1,299,686	3,693	397	35,585	4,391	15	6	...
Total for the Province		17,487,125	5,207	6,749	355,279	17,281	123	140	...

DISTRICTS and TOWNS of the PUNJAB during the year 1881.

8			9		10		11							12	
RIES.			All other causes.	Total deaths from all causes.	RATIO OF DEATHS PER 1,000 OF POPULATION.							From all causes.		Number.	
Wounds or accidents.	Snake-bite or killed by wild beasts.	Total.			Cholera.	Small-pox.	Fevers.	Bowel complaints.	Injuries.	All other causes.	For the year.	Mean of previous five years.			
26	3	30	1,775	5,540	0.09	0.47	30.72	0.92	0.26	15.30	48	63	1		
2	...	3	323	1,658	1.52	0.11	27.24	1.01	0.07	7.25	37	42	2		
1	1	2	55	350	0.15	0.07	20.53	0.73	0.15	4.03	26	28	3		
4	...	5	197	449	...	...	19.63	3.68	0.47	18.59	42	73	4
7	...	7	283	718	...	0.04	13.14	3.81	0.28	11.23	28	49	5		
4	...	4	153	445	...	...	23.46	3.89	0.38	14.53	42	65	6
4	...	4	216	580	...	...	17.19	9.37	0.30	15.94	43	78	7
10	...	10	493	1,076	0.04	1.62	17.49	4.70	0.42	20.53	45	60	8		
5	2	7	64	348	...	0.32	10.44	6.77	0.44	4.05	22	30	9		
8	1	9	330	951	4.65	...	16.57	3.75	0.37	13.47	39	35	10		
1	3	5	249	520	...	...	16.52	2.26	0.35	17.58	37	44	11
3	...	3	103	370	...	0.16	19.90	1.56	0.24	8.43	30	38	12		
5	1	6	560	1,112	...	0.06	12.10	4.27	0.18	16.86	33	33	13		
...	...	...	162	386	0.07	...	12.74	2.13	...	10.80	26	37	14
5	1	6	140	322	...	0.48	11.88	1.77	0.48	11.24	26	42	15		
2	1	3	60	272	...	...	14.91	1.40	0.23	4.68	21	36	16
11	...	11	577	1,349	4.76	0.57	18.74	4.91	0.42	21.97	51	43	17		
3	...	3	227	450	0.16	0.16	14.37	2.87	0.24	18.13	36	35	18		
...	...	...	99	311	1.03	0.94	13.81	2.40	...	8.49	27	30	19
...	...	...	85	267	...	0.36	14.86	1.07	...	7.61	24	34	20
...	1	2	128	256	...	0.49	10.04	1.75	0.19	12.47	25	35	21		
9	1	11	527	1,494	0.25	0.07	20.63	2.72	0.27	13.05	37	57	22		
5	...	5	268	599	...	...	14.34	5.64	0.31	16.42	37	50	23
8	1	9	473	1,633	11.95	...	18.51	2.21	0.25	13.43	46	65	24		
1	...	1	165	560	10.95	...	12.55	1.59	0.06	10.51	36	60	25		
4	...	4	65	361	4.07	...	20.99	1.36	0.36	5.88	33	49	26		
2	1	3	170	595	0.85	0.39	27.18	4.26	0.23	13.16	46	37	27		
4	1	5	203	593	10.20	...	11.26	7.84	0.38	15.45	45	48	28		
4	...	4	192	539	0.07	...	20.33	4.15	0.29	13.74	38	45	29		
61	6	73	3,615	16,984	4.49	0.01	86.10	7.03	0.54	26.55	125	61	30		
9	2	11	227	1,365	9.65	0.11	28.78	3.30	0.41	8.43	51	26	31		
7	...	7	604	1,389	6.40	0.03	11.55	5.61	0.21	18.31	42	31	32		
29	6	35	677	5,193	8.39	0.09	39.27	0.94	0.38	7.35	56	45	33		
6	1	8	403	1,649	9.04	0.03	20.08	4.86	0.22	11.07	45	31	34		
2	...	2	149	593	5.83	...	18.70	1.79	0.12	8.87	35	29	35		
5	...	7	287	903	7.51	...	19.20	3.19	0.34	14.09	44	41	36		
...	...	1	123	488	3.52	...	17.85	2.34	0.06	8.01	32	36	37		
5	1	7	198	788	...	...	35.27	3.16	0.46	13.05	52	63	38
11	...	12	395	1,069	1.68	...	23.75	6.39	0.58	18.99	51	76	39		
3	...	3	60	235	0.62	...	12.90	1.68	0.26	5.30	21	41	40		
1	...	1	172	437	...	0.19	10.07	6.88	0.06	11.17	28	39	41		
6	...	6	209	425	0.29	...	9.14	2.64	0.34	12.01	24	31	42		
3	...	3	186	459	2.00	...	13.20	4.07	0.21	13.27	33	41	43		
7	2	9	186	463	...	...	14.21	4.01	0.61	12.64	31	37	44
17	3	21	484	1,020	...	...	13.17	4.31	0.71	16.43	35	35	45
9	1	11	327	831	...	0.04	19.85	3.08	0.51	15.26	38	42	46		
6	3	9	152	303	...	...	8.44	1.98	0.66	11.16	22	27	47
4	1	5	158	286	...	...	8.33	1.92	0.42	13.17	24	28	48
3	1	5	176	477	...	1.10	11.73	2.00	0.25	8.82	24	32	49		
5	...	5	168	453	...	0.57	13.07	0.99	0.26	8.78	24	39	50		
23	4	27	822	2,467	...	2.45	22.32	2.93	0.46	14.07	42	59	51		
6	1	7	78	320	...	3.71	15.57	1.99	0.63	7.06	29	24	52		
366	50	437	18,198	62,701	2.84	0.30	27.38	3.38	0.34	14.00	48	47			
4,231	1,201	5,695	129,568	519,779	0.30	0.38	20.32	0.99	0.32	7.41	30	30			

DEATHS REGISTERED in the FRONTIER CANTONMENTS and HILL SANITARIA during the year 1881

Number.	Frontier Cantonments and Hill Sanitaria.	Population.	Cholera.	Small-pox.	Fevers.	Bowel complaints.	INJURIES.					All other causes.	Total deaths from all causes	Ratio of deaths per 1,000 of population.	Total births registered during the year.	Ratio of births per 1,000 of population.
							Suicide.		Wounds or accidents.	Snake-bite or killed by wild beasts.	Total.					
							Males.	Females.								
<i>Frontier Cantonments.</i>																
1	Abbottabad ...	2,894	...	...	5	5	...	...	3	...	3	31	44	15	39	13
2	Mardan ...	1,964	...	1	9	...	1	...	...	1	2	25	37	19	41	21
3	Kohát ...	5,210	...	3	19	13	...	...	5	...	5	51	91	17	10	2
4	Edwardes-abad ...	3,224	...	4	13	16	...	...	2	1	3	40	76	23	27	8
5	Dera Ismail Khan ...	5,331	...	1	11	6	...	...	...	...	...	31	49	9	25	5
6	Dera Gházi Khan ...	2,937	...	3	19	4	...	...	...	...	...	14	40	14	21	7
7	Rájanpur ...	1,138	...	...	2	...	...	...	...	...	...	11	13	11	12	10
<i>Hill Sanitaria.</i>																
1	Simla ...	17,440	...	...	119	16	1	1	6	1	9	110	254	14	79	4
2	Dharamsála ...	2,862	1	...	39	46	1	...	1	1	3	40	129	45	89	31
3	Dalhousie ...	2,255	...	...	13	5	...	...	1	...	1	14	33	15	7	3
4	Murree ...	7,939	1	...	27	5	...	...	...	...	...	12	45	6	20	2
Total ...		53,194	2	12	276	116	3	1	18	4	26	379	811	15	370	7

DEATHS REGISTERED from CHOLERA in the DISTRICTS of the PUNJAB during each month of the year 1881.

1 Number.	2 DISTRICTS.	3 Circles of registration.		4 Villages.		5												6 Total.			7 Ratio of deaths per 1,000 of population.			8 Mean ratio per 1,000 of previous 5 years.	9 Number.			
		Number in each district.	Number from which deaths from Cholera were reported.	Number in each district.	Number from which deaths from Cholera were reported.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.					
DELHI DIVN.																												
1	Delhi	15	6	743	13	29	86	47	103	64	167	0.31	0.23	0.27	0.15	1		
2	Gurgaon	15	4	1,239	4	1	..	3	1	4	1	5	0.01	0.003	0.01	0.27	2		
2	Karnal	14	4	868	8	2	..	49	74	74	51	125	0.22	0.18	0.20	0.53	3		
HISSAR DIVN.																												
4	Hissar	13	..	715	1.52	4	
5	Rohtak	11	1	498	1	1	1	..	1	0.003	..	0.001	0.76	5		
6	Sirsa	13	1	626	1	1	1	..	1	0.01	..	0.004	1.36	6		
UMBALLA DIVISION.																												
7	Umballa	20	8	2,225	18	..	..	..	..	..	3	32	145	31	..	1	119	93	212	0.22	0.20	0.21	0.12	7
8	Ludhiana	10	3	851	6	..	..	..	..	1	1	7	12	..	..	..	8	13	21	0.02	0.05	0.04	0.90	8
9	Simla	4	..	238	0.65	9		
JULLUNDUR DIVISION.																												
10	Jullundur	9	8	1,233	29	..	..	..	..	..	..	..	596	246	23	..	484	381	865	1.13	1.08	1.10	0.22	10
11	Hoshiarpur	14	7	2,178	26	..	..	..	..	1	..	..	27	246	56	1	161	170	331	0.32	0.29	0.35	0.02	11
12	Kangra	15	4	704	17	..	..	1	..	..	24	10	..	1	1	..	24	13	37	0.06	0.04	0.05	0.55	12
AMRITSAR DIVISION.																												
13	Amritsar	10	7	1,078	22	..	..	1	2	1	3	4	49	407	232	8	433	274	707	0.93	0.74	0.85	0.22	13		
14	Gurdaspur	17	11	2,302	25	1	4	..	..	1	6	..	4	276	39	1	164	168	332	0.33	0.41	0.37	0.02	14		
15	Siakot	13	5	2,315	22	1	..	..	1	..	..	1	6	272	32	..	166	157	323	0.29	0.34	0.31	0.10	15
LAHORE DIVN.																												
16	Lahore	21	18	1,672	116	..	..	2	..	2	51	104	818	590	71	5	1,034	609	1,643	2.41	1.75	2.12	0.62	16		
17	Gujranwala	9	5	1,177	15	..	..	..	1	..	1	..	21	221	16	1	135	126	261	0.44	0.51	0.47	0.25	17	
18	Ferozepore	15	4	1,276	7	..	..	..	..	..	..	5	..	18	..	..	15	8	23	0.05	0.03	0.04	0.73	18
RAWALPINDI DIVISION.																												
19	Rawalpindi	18	8	1,724	18	..	..	..	..	..	1	10	25	32	22	..	73	17	90	0.19	0.05	0.13	1.02	19
20	Jhelum	13	4	1,042	7	..	..	..	..	..	..	6	1	3	10	..	14	6	20	0.05	0.02	0.04	0.91	20
21	Gujrat	9	2	1,416	4	..	..	..	..	..	..	..	22	13	..	..	19	16	35	0.06	0.06	0.06	0.31	21
22	Shahpur	15	1	632	1	..	..	..	..	..	..	..	1	..	..	..	1	..	1	0.005	..	0.002	0.37	22
MOOLTAN DIVISION.																												
23	Mooltan	14	..	1,233	0.02	23	
24	Jhang	13	..	976	0.14	24	
25	Montgomery	18	3	1,518	3	..	..	..	..	..	..	..	2	3	..	..	3	2	5	0.01	0.01	0.01	0.57	25
26	Muzaffargarh	13	..	534	0.001	26	
DERAJAT DIVISION.																												
27	Dera Ismail Khan	19	..	772	0.14	27
28	Dera Ghazi Khan	17	..	422	0.05	28
29	Bannu	13	..	553	0.61	29
PESHAWAR DIVISION.																												
30	Peshawar	19	2	730	3	..	..	..	..	..	1	..	..	1	1	..	2	1	3	0.007	0.004	0.005	0.72	30
31	Hazara	15	3	1,013	3	..	..	..	..	..	..	..	..	2	1	..	3	..	3	0.01	..	0.008	0.56	31
32	Kohat	12	2	469	2	..	..	..	..	3	..	..	3	..	..	..	5	1	6	0.06	0.01	0.04	0.91	32
Total for the Province		446	121	34,973	371	3	4	4	5	37	178	183	1,649	2,560	545	38	1	3,036	2,171	5,207	0.32	0.27	0.30	0.37				

DEATHS REGISTERED from SMALL-POX in the DISTRICTS of the

1 Number.	2 DISTRICTS.	3 Circles of registration.		4 Villages.		5					
		Number in each district.	Number from which deaths from Small-pox were reported.	Number in each district.	Number from which deaths from Small-pox were reported.	January.	February.	March.	April.	May.	June.
DELHI DIVISION.											
1	Delhi	15	4	743	11	...	1	6	13	30	17
2	Gurgaon	15	14	1,239	41	6	...	6	17	17	16
3	Karnal	14	14	868	141	23	12	23	42	42	41
HISSAR DIVISION.											
4	Hissar	13	8	715	13	1	2	1	5	2	1
5	Rohtak	11	3	498	6	2	5	13	11	5	2
6	Sirsa	13	4	626	17	1	4	35	11	11	3
UMBALLA DIVISION.											
7	Umballa	20	17	2,225	309	16	20	34	52	46	70
8	Ludhiana	10	7	851	29	4	9	12	6	10	6
9	Simla	4	...	238	...	...	...	...	...	...	...
JULLUNDUR DIVISION.											
10	Jullundur	9	8	1,233	26	4	7	4	8	9	12
11	Hoshiarpur	14	10	2,178	41	4	4	2	6	10	6
12	Kangra	15	1	704	1	...	...	1	...	...	...
AMRITSAR DIVISION.											
13	Amritsar	10	10	1,078	43	2	1	5	6	14	6
14	Gurdaspur	17	9	2,302	20	6	5	4	6	4	4
15	Sialkot	13	6	2,315	8	...	4	2	2	3	2
LAHORE DIVISION.											
16	Lahore	21	12	1,672	49	6	5	7	7	9	11
17	Gujranwala	9	7	1,177	25	5	6	4	2	3	2
18	Ferozepore	15	13	1,276	43	6	6	9	12	14	14
RAWALPINDI DIVISION.											
19	Rawalpindi	18	5	1,725	12	7	1	5	1	...	2
20	Jhelum	13	6	1,042	7	1	1	2	3	2	1
21	Gujrat	9	3	1,416	5	3	...	...	...	1	...
22	Shahpur	15	6	632	15	3	5	6	5	6	...
MOOLTAN DIVISION.											
23	Mooltan	14	11	1,233	101	15	32	26	29	39	39
24	Jhang	13	12	976	56	11	9	17	10	4	3
25	Montgomery	18	16	1,518	102	6	8	6	8	16	25
26	Muzaffargarh	13	11	534	92	48	78	70	18	14	10
DERAJAT DIVISION.											
27	Dera Ismail Khan	19	19	772	228	295	345	241	182	95	44
28	Dera Ghazi Khan	17	12	422	84	49	113	108	105	51	28
29	Bannu	13	12	553	148	156	140	111	75	42	22
PESHAWAR DIVISION.											
30	Peshawar	19	19	730	271	121	114	166	158	144	191
31	Hazara	15	3	1,013	11	4	4	5	1	4	2
32	Kohat	12	12	469	81	17	34	43	30	17	20
Total for the Province		446	294	34,973	2,036	822	975	974	831	664	600

PUNJAB during each month of the year 1881.

July.	August.	September.	October.	November.	December.	6			7		8			9	10	
						Total.			Number of these deaths among children.		Total ratio of deaths per 1,000 of population.					Mean ratio per 1,000 of previous 5 years.
						Males.	Females.	Total.	Under one year.	One and under twelve years.	Males.	Females.	Total.			
5	...	...	...	...	...	36	36	72	2	64	0.11	0.13	0.12	0.54	1
7	2	1	1	4	4	48	33	81	27	52	0.13	0.10	0.12	2.86	2	
49	17	26	36	8	19	185	153	338	103	200	0.56	0.55	0.55	2.76	3	
1	1	...	1	...	...	10	5	15	2	13	0.04	0.02	0.03	0.73	4
9	2	1	1	...	...	29	22	51	13	36	0.10	0.09	0.09	0.74	5
3	1	2	3	...	2	46	30	76	33	41	0.39	0.32	0.36	1.25	6	
52	42	93	63	45	44	332	245	577	286	274	0.60	0.53	0.57	1.75	7	
1	3	3	4	...	3	38	23	61	13	47	0.12	0.09	0.10	1.44	8	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.33	9
2	3	1	...	...	...	24	26	50	13	31	0.05	0.07	0.06	0.36	10
2	3	3	...	...	...	21	19	40	9	27	0.04	0.04	0.04	0.60	11
...	...	...	...	...	...	1	...	1	...	...	...	...	...	0.15	12
6	2	2	...	...	1	23	22	45	20	21	0.05	0.06	0.05	2.13	13
1	...	1	...	2	1	16	18	34	14	19	0.03	0.04	0.04	0.94	14	
1	...	...	...	2	...	8	8	16	7	9	0.01	0.02	0.02	0.80	15
8	11	5	10	7	2	34	54	88	26	53	0.08	0.15	0.11	2.34	16	
3	2	1	1	...	1	17	13	30	10	20	0.05	0.05	0.05	1.42	17	
1	5	...	2	...	1	32	38	70	17	48	0.11	0.16	0.13	1.42	18	
...	1	...	...	...	4	8	13	21	5	13	0.02	0.04	0.03	1.24	19
...	...	...	...	...	1	9	2	11	8	3	0.03	0.01	0.02	1.12	20
...	...	1	...	...	...	3	2	5	4	1	0.01	0.01	0.01	1.72	21
...	...	...	...	...	...	16	9	25	8	14	0.08	0.05	0.07	1.75	22
28	13	3	4	3	19	124	126	250	52	180	0.49	0.61	0.54	1.33	23	
3	...	1	...	2	...	35	25	60	17	38	0.18	0.16	0.17	0.95	24	
20	12	12	17	11	7	72	76	148	30	91	0.36	0.48	0.41	2.73	25	
4	1	...	1	...	...	130	114	244	75	141	0.80	0.85	0.82	2.14	26
29	2	4	1	2	10	670	580	1,250	323	810	3.15	3.18	3.16	2.36	27	
20	6	2	...	10	18	274	236	510	126	366	1.60	1.70	1.64	1.10	28	
12	1	5	4	3	1	316	256	572	122	405	2.05	1.92	1.99	2.96	29	
232	98	60	104	94	143	901	724	1,625	322	1,245	3.37	3.11	3.25	1.23	30	
1	1	1	...	...	...	10	13	23	2	19	0.05	0.07	0.06	0.85	31
21	9	18	32	44	75	203	157	360	58	276	2.56	2.37	2.47	1.11	32	
521	238	246	285	237	356	3,671	3,078	6,749	1,747	4,557	0.39	0.38	0.38	1.39		

DEATHS REGISTERED from FEVERS in the DISTRICTS of

1	2	3		4		5					
		Circles of registration.		Villages.		January.	February.	March.	April.	May.	
		Number in each district.	Number from which deaths from fevers were reported.	Number in each district.	Number from which deaths from fevers were reported.						
Number.	DISTRICTS.										
	DELHI DIVISION.										
1	Delhi	15	15	743	725	1,214	1,249	1,183	1,408	1,201	
2	Gurgaon	15	15	1,239	941	1,123	1,159	1,171	1,201	801	
3	Karnal	14	14	863	790	1,138	1,291	1,126	1,378	1,008	
	HISSAR DIVISION.										
4	Hissar	13	13	715	695	627	601	651	744	894	
5	Rohtak	11	11	498	479	908	909	831	982	854	
6	Sirsa	13	13	626	547	233	306	339	375	389	
	UMBALLA DIVISION.										
7	Umballa	20	20	2,225	1,894	1,828	1,871	1,652	1,819	1,200	
8	Ludhiána	10	10	851	690	778	687	525	582	707	
9	Siala	4	4	238	57	12	13	14	23	20	
	JULLUNDUR DIVISION.										
10	Jullundur	9	9	1,233	1,076	1,203	1,055	814	772	863	
11	Hoshiárpur	14	14	2,178	1,713	1,127	1,128	1,039	835	977	
12	Kángra	15	15	704	701	1,067	940	859	788	880	
	AMRITSAR DIVISION.										
13	Amritsar	10	10	1,078	908	1,160	833	821	702	1,037	
14	Gurdáspur	17	17	2,302	1,849	1,321	1,047	739	572	902	
15	Siddkot	13	13	2,315	2,150	1,357	929	766	669	1,118	
	LAHORE DIVISION.										
16	Lakore	21	21	1,672	1,048	1,571	1,231	936	856	1,015	
17	Gujránwála	9	9	1,177	1,122	977	849	603	501	688	
18	Ferozepore	15	15	1,276	874	730	654	537	571	693	
	RAWALPINDI DIVISION.										
19	Rawalpindi	18	18	1,725	1,398	1,632	1,313	1,199	830	860	
20	Jhelum	13	13	1,042	716	776	655	616	512	496	
21	Gujrat	9	9	1,416	1,288	925	585	434	518	515	
22	Shahpur	15	15	632	609	384	389	341	320	406	
	MOOLTAN DIVISION.										
23	Mooltan	14	14	1,233	792	1,105	889	703	827	689	
24	Jhang	13	13	976	770	368	371	342	262	352	
25	Montgomery	18	18	1,518	989	593	476	418	330	408	
26	Muzaffargarh	13	13	534	515	623	549	576	542	527	
	DERAJAT DIVISION.										
27	Dera Ismail Khan	19	19	772	435	704	529	457	490	515	
28	Dera Gházi Khan	17	17	422	289	384	307	315	298	260	
29	Bannu	13	13	553	366	448	425	310	316	382	
	PESHAWAR DIVISION.										
30	Pesháwar	19	19	730	614	794	928	755	767	695	
31	Hazára	15	14	1,013	577	659	596	549	433	385	
32	Kohát	12	12	469	329	221	188	180	160	12	
	Total for the Province	446	445	34,973	27,946	27,990	24,952	21,801	21,383	211,848	

the PUNJAB during each month of the year 1881.

June.	July.	August.	September.	October.	November.	December.	6			7			8	9
							Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous 5 years.	Number.
							Males.	Females.	Total.	Males.	Females.	Total.		
1,217	908	661	1,081	1,696	1,852	2,064	8,302	7,432	15,734	25.44	26.30	25.84	29.54	1
738	590	491	1,060	2,343	2,043	2,129	7,991	6,858	14,849	21.58	21.01	21.31	31.18	2
1,043	856	642	1,446	1,332	1,550	1,889	7,928	6,771	14,699	23.97	24.17	24.06	24.07	3
748	621	474	1,122	1,234	824	770	5,080	4,220	9,300	19.04	19.37	19.19	15.43	4
854	681	543	1,120	1,626	1,452	1,430	6,782	5,408	12,190	23.19	22.11	22.70	26.81	5
328	243	226	509	580	476	365	2,295	2,074	4,369	19.61	22.12	20.73	15.50	6
1,284	1,264	1,074	2,827	4,029	2,929	2,993	13,271	11,499	24,770	24.10	25.09	24.55	18.95	7
659	580	680	1,743	2,290	1,563	945	6,238	5,501	11,739	19.53	20.84	20.13	20.23	8
25	19	32	42	44	18	20	180	102	282	8.14	8.89	8.39	7.79	9
750	621	833	1,768	2,883	2,325	1,596	7,879	7,604	15,483	18.36	21.49	19.64	35.31	10
984	751	956	2,573	4,038	2,765	1,750	9,620	9,303	18,923	19.07	21.41	20.15	24.15	11
919	706	898	1,636	2,346	1,459	1,400	7,265	6,723	13,988	18.46	19.19	18.81	16.06	12
1,103	758	991	4,027	8,005	6,428	3,097	14,798	14,164	28,962	31.82	38.52	34.78	23.45	13
750	667	673	1,883	4,024	3,054	2,103	8,997	8,738	17,735	17.95	21.58	19.57	21.38	14
892	805	871	1,898	4,046	3,644	2,320	10,114	9,201	19,315	18.77	20.79	19.42	18.29	15
1,075	789	1,510	2,040	3,684	3,691	2,660	10,939	10,119	21,058	25.54	29.14	27.15	23.23	16
652	575	628	848	1,221	1,139	970	5,094	4,557	9,651	16.63	18.65	17.53	23.50	17
638	550	590	1,338	2,077	1,712	1,117	5,860	5,347	11,207	19.96	22.29	21.01	18.79	18
829	730	765	921	1,221	1,278	1,385	7,023	5,940	12,963	18.64	18.39	18.53	25.66	19
495	524	453	605	826	726	811	3,904	3,591	7,495	14.75	15.20	14.96	17.32	20
570	546	468	795	1,032	892	859	4,222	3,917	8,139	12.72	13.77	13.20	17.04	21
399	311	259	321	359	464	485	2,294	2,144	4,438	11.71	12.39	12.03	14.20	22
568	516	411	530	1,261	1,480	1,708	5,770	4,917	10,687	22.83	23.75	23.24	17.71	23
258	249	195	256	336	406	401	2,033	1,763	3,796	10.50	11.42	10.91	8.32	24
376	300	268	376	1,014	1,365	1,146	3,779	3,291	7,070	18.89	20.64	19.67	14.95	25
424	318	284	393	731	1,015	745	3,678	3,049	6,727	22.69	22.85	22.76	20.93	26
466	386	224	265	374	450	661	3,055	2,466	5,521	14.36	13.54	13.98	16.00	27
257	303	213	315	492	451	552	2,321	1,826	4,147	13.55	13.16	13.38	11.64	28
389	278	184	220	811	392	492	2,330	1,817	4,147	15.12	13.61	14.42	13.24	29
607	566	330	419	718	774	952	4,502	3,803	8,305	16.82	16.33	16.59	12.03	30
363	330	328	445	552	436	729	3,127	2,678	5,805	16.33	15.23	15.81	14.32	31
141	82	94	114	143	150	191	988	797	1,785	12.45	12.06	12.27	8.64	32
20,801	17,423	17,249	34,936	56,868	49,203	40,825	187,659	167,620	355,279	19.73	21.01	20.32	20.72	

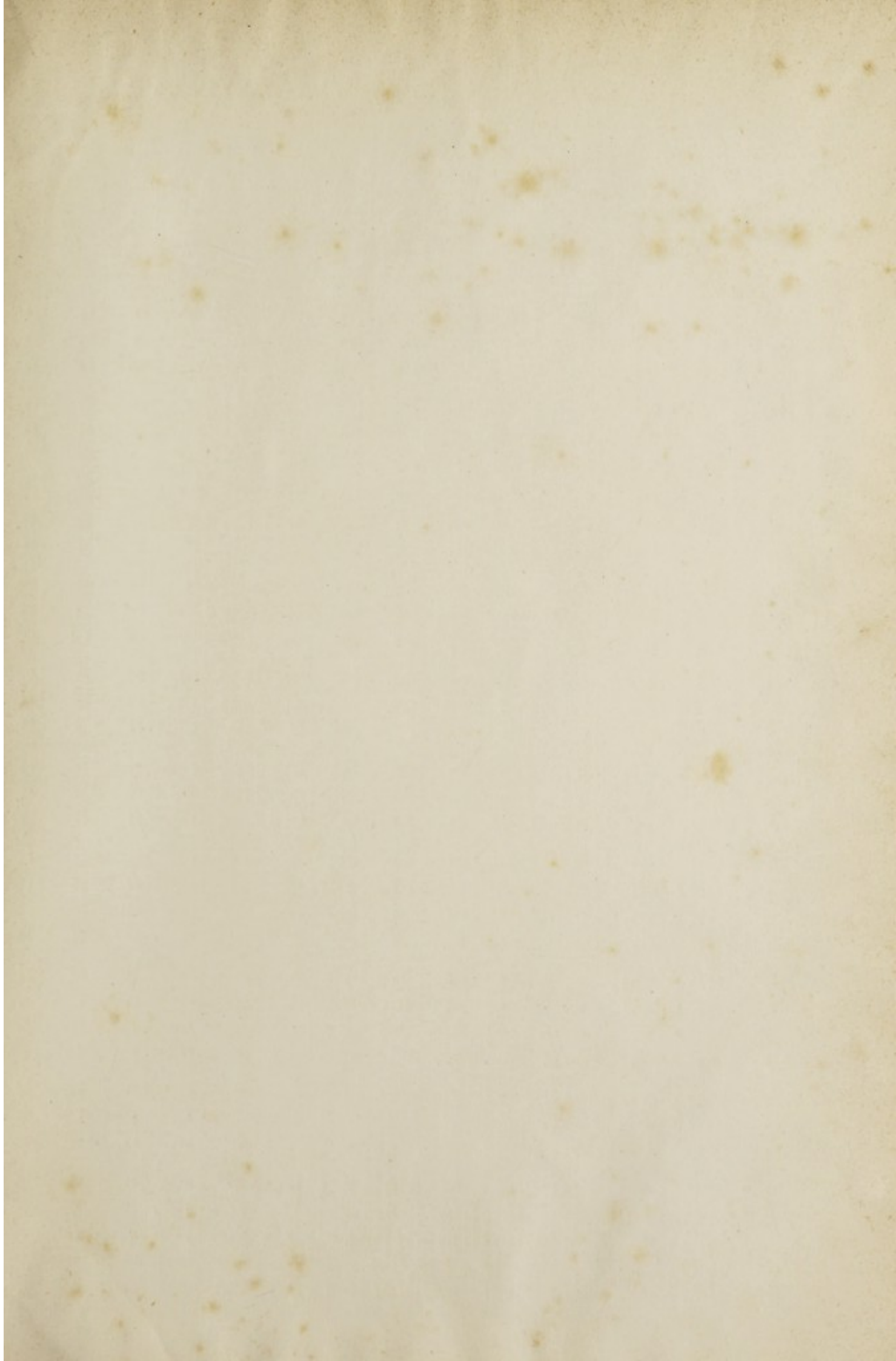
DEATHS REGISTERED from BOWEL COMPLAINTS in the

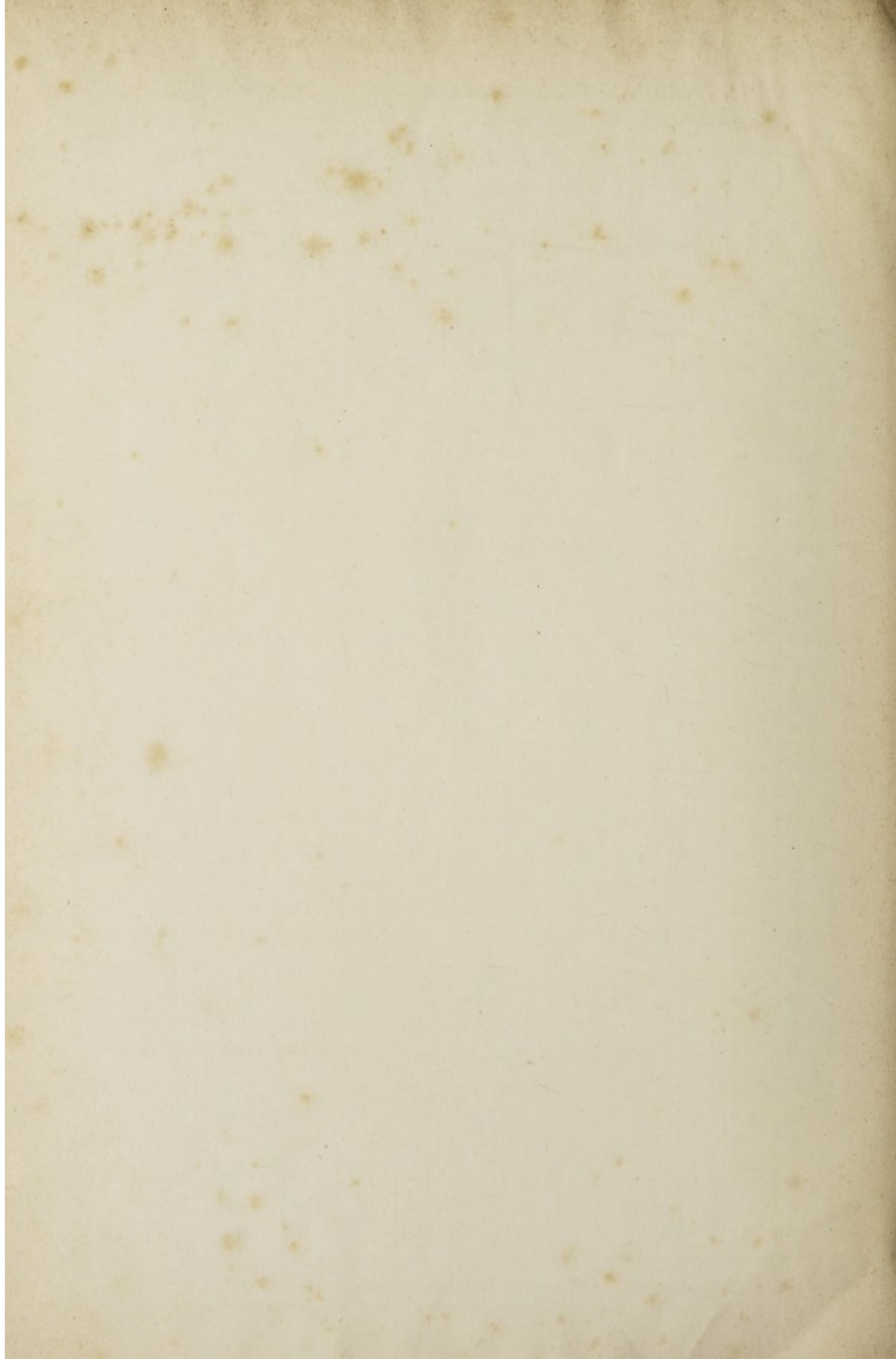
1 Number.	2 DISTRICTS.				3 Circles of Registration.		4 Villages.		5				
					Number in each district.	No. from which deaths from bowel complaints were reported.	Number in each district.	No. from which deaths from bowel complaints were reported.	January.	February.	March.	April.	May.
DELHI DIVISION.													
1	Delhi	...	...	...	15	15	743	230	31	33	38	36	52
2	Gurgaon	...	...	...	15	14	1,239	207	41	48	51	50	43
3	Karnál	...	...	...	14	14	868	138	54	54	53	47	41
HISSAR DIVISION.													
4	Hissar	...	...	...	13	12	715	138	25	12	13	28	26
5	Rohtak	...	...	...	11	9	498	50	20	16	16	28	22
6	Sirsa	...	...	...	13	11	626	102	17	11	23	19	25
UMBALLA DIVISION.													
7	Umballa	...	...	...	20	20	2,225	496	83	70	73	74	86
8	Ludhiána	...	...	...	10	10	851	244	33	25	26	42	55
9	Simla	...	...	...	4	4	238	62	8	7	5	11	4
JULLUNDUR DIVISION.													
10	Jullundur	...	...	...	9	9	1,233	116	33	17	16	16	37
11	Hoshiárpur	...	...	...	14	14	2,178	615	52	39	61	63	89
12	Kángra	...	...	...	15	15	704	351	123	113	98	82	131
AMRITSAR DIVISION.													
13	Amritsar	...	...	...	10	10	1,078	209	49	37	41	42	53
14	Gurdáspur	...	...	...	17	17	2,302	480	60	33	33	45	57
15	Síálkot	...	...	...	13	13	2,315	324	49	34	18	35	68
LAHORE DIVISION.													
16	Lahore	...	...	...	21	20	1,672	259	68	33	45	38	34
17	Gujránwála	...	...	...	9	9	1,177	225	36	23	17	31	40
18	Ferozepore	...	...	...	15	14	1,276	56	24	22	25	30	24
RAWALPINDI DIVISION.													
19	Rawalpindi	...	...	...	18	18	1,725	372	154	113	104	77	75
20	Jhelum	...	...	...	13	13	1,042	284	83	64	61	70	62
21	Gujrat	...	...	...	9	9	1,416	161	26	22	26	39	29
22	Shahpur	...	...	...	15	15	632	154	37	47	34	28	38
MOOLTAN DIVISION.													
23	Mooltan	...	...	...	14	13	1,233	96	31	23	30	36	20
24	Jhang	...	...	...	13	13	976	164	14	9	16	24	34
25	Montgomery	...	...	...	18	17	1,518	140	18	10	8	18	18
26	Muzaffargarh	...	...	...	13	12	534	54	14	6	10	12	6
DERAJAT DIVISION.													
27	Dera Ismail Khan	...	...	...	19	17	772	62	18	18	14	29	19
28	Dera Gházi Khan	...	...	...	17	12	422	23	5	4	7	5	5
29	Bannu	...	...	...	13	13	553	105	25	19	28	13	21
PESHAWAR DIVISION.													
30	Pesháwar	...	...	...	19	19	730	80	33	26	21	29	17
31	Hazára	...	...	...	15	11	1,013	57	11	18	12	14	27
32	Kohát	...	...	...	12	11	469	45	22	9	10	8	2
Total for the Province					446	423	34,973	6,099	1,297	1,015	1,033	1,119	1,260

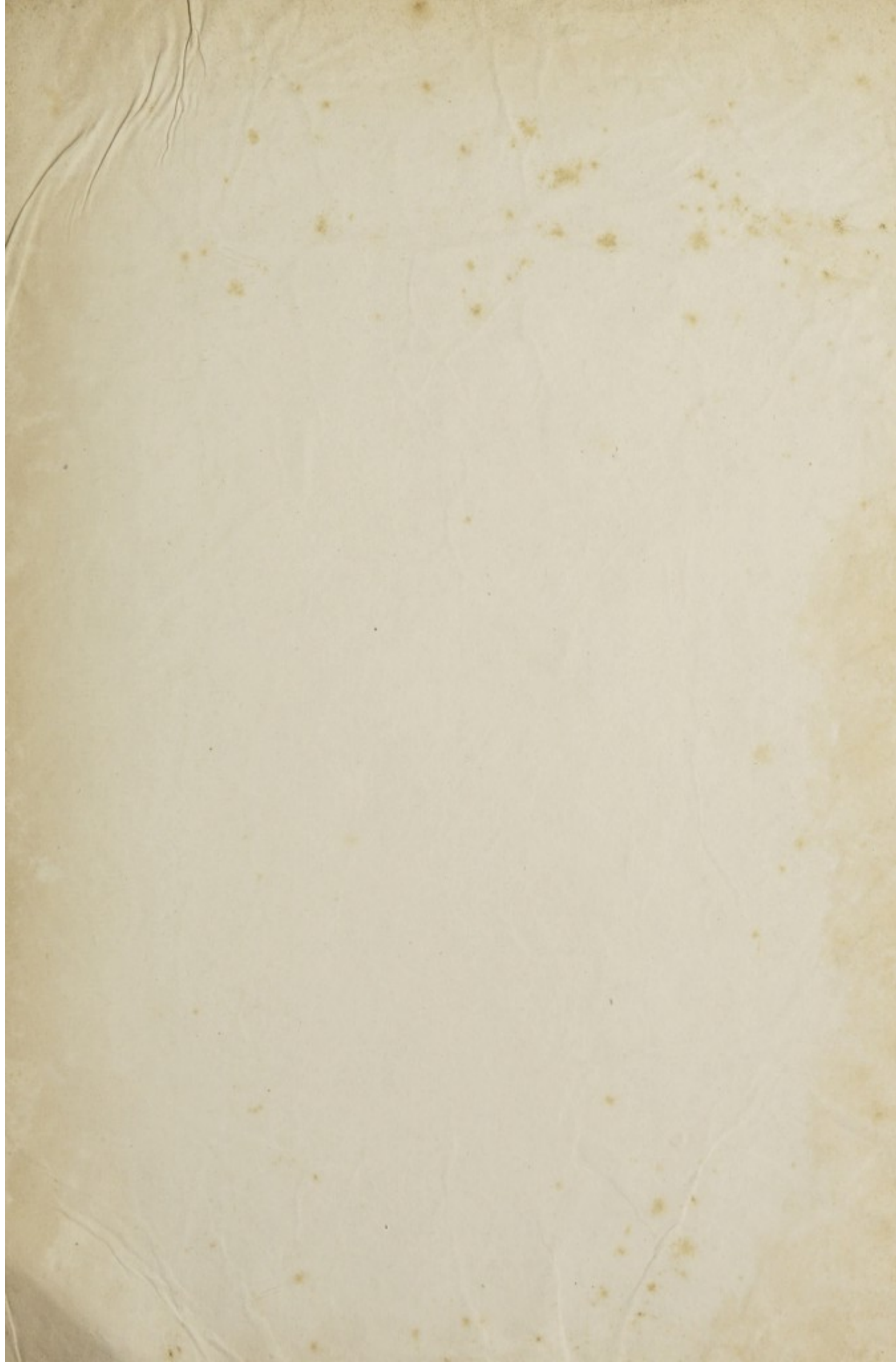
DISTRICTS of the PUNJAB during each month of the year 1881.

June.	July.	August.	September.	October.	November.	December.	6			7			8	9
							Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous 5 years.	Number.
							Males.	Females.	Total.	Males.	Females.	Total.		
41	49	45	59	87	69	71	358	253	611	1.10	0.89	1.00	2.43	1
43	54	63	158	93	99	73	441	375	816	1.19	1.15	1.17	3.04	2
57	55	52	64	52	63	68	374	286	660	1.13	1.02	1.08	1.86	3
30	27	51	60	50	37	18	220	157	377	0.82	0.72	0.78	0.96	4
19	18	23	42	40	27	25	167	129	296	0.57	0.53	0.55	1.04	5
17	23	28	18	20	9	16	131	95	226	1.12	1.01	1.07	1.25	6
92	91	89	127	150	143	143	758	463	1,221	1.38	1.01	1.21	2.18	7
25	29	48	69	77	54	36	307	212	519	0.96	0.80	0.89	1.53	8
12	15	9	5	9	8	2	59	36	95	2.67	3.14	2.83	3.36	9
20	28	47	77	64	87	43	261	224	485	0.61	0.63	0.62	1.02	10
59	56	74	135	196	108	64	551	445	996	1.09	1.02	1.06	2.85	11
149	100	69	93	112	98	90	709	549	1,258	1.80	1.57	1.69	2.74	12
59	46	79	162	313	294	182	834	523	1,357	1.79	1.42	1.63	1.65	13
33	40	49	103	182	120	84	475	364	839	0.95	0.90	0.92	1.57	14
30	41	80	196	118	81	81	499	332	831	0.93	0.73	0.83	1.02	15
54	48	73	74	66	71	79	480	203	683	1.12	0.58	0.88	1.01	16
47	21	41	57	39	32	33	263	154	417	0.86	0.63	0.76	0.90	17
39	68	34	49	39	40	24	266	152	418	0.91	0.63	0.78	0.78	18
74	93	88	128	143	103	131	790	493	1,283	2.10	1.53	1.83	1.32	19
50	95	73	90	138	78	95	561	398	959	2.12	1.68	1.91	1.61	20
24	24	39	53	65	39	34	282	138	420	0.85	0.48	0.68	0.85	21
35	37	49	36	27	42	37	265	182	447	1.35	1.05	1.21	1.47	22
18	23	32	40	49	41	42	233	152	385	0.92	0.73	0.84	0.95	23
22	9	16	22	20	20	21	133	94	227	0.69	0.61	0.65	0.50	24
24	14	9	11	11	19	24	118	66	184	0.59	0.41	0.51	0.47	25
9	2	6	11	11	24	9	84	36	120	0.52	0.27	0.41	0.29	26
18	23	14	20	23	23	19	150	88	238	0.70	0.48	0.60	0.61	27
11	3	4	5	11	9	6	43	32	75	0.25	0.23	0.24	0.60	28
22	26	24	26	25	22	22	157	116	273	1.02	0.87	0.95	1.20	29
25	24	13	25	24	37	32	216	90	306	0.81	0.39	0.61	0.91	30
21	17	13	5	8	5	11	113	49	162	0.59	0.28	0.44	0.94	31
7	9	5	5	3	12	5	71	26	97	0.89	0.39	0.67	0.64	32
1,186	1,208	1,339	2,025	2,265	1,914	1,620	10,369	6,912	17,281	1.09	0.87	0.99	1.45	

No.	Name	Age	Sex	Religion	Caste	Profession	Income		Total	Remarks
							Land	Other		
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REPORT

ON THE

SANITARY ADMINISTRATION

OF THE

PUNJAB

FOR THE YEAR 1881



Lahore:

PRINTED AT THE ALBERT PRESS,

1882.