

MEMORANDUM
ON THE
HOSPITAL ACCOMMODATION
FOR
INFECTIOUS DISEASES
IN GLASGOW.

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WITH NOTE BY MASTER OF WORKS.

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MEMORANDUM
ON THE
HOSPITAL ACCOMMODATION
FOR
INFECTIOUS DISEASES IN GLASGOW.

BY THE MEDICAL OFFICER OF HEALTH.
December, 1882.

1. *What ought to be the aggregate extent of Hospital Accommodation for Infectious Diseases in Glasgow?*

We naturally turn to the experience of Glasgow in the past for guidance as to the provision of hospital accommodation which is likely to be necessary in the future. Absolutely the largest number of beds ever provided for infectious disease in Glasgow was 1254, in 1847, when Typhus prevailed to an extent which is without parallel in the history of the city. These were equipped by the Royal Infirmary and Parochial Boards. In that year 11,425 cases of Typhus were treated in those hospitals, and the death-rate per 1000 of the population was $14\frac{1}{2}$ from Fever alone. This experience is now, however, useful more as a warning than a guide. It was necessitated by two circumstances—(1) That the hospital accommodation was hurriedly created in the midst of the epidemic, and was never in advance of it; (2) that no public sanitary organization existed, and the local conditions of filth and overcrowding, upon which the epidemic fed, were neglected. The following Table, showing the nature and extent of the accommodation which has been from time to time required since 1865, when the Local Authority began the treatment of infectious diseases in hospitals of their own, and contemporaneously developed their general Sanitary operations, is more to the purpose. It is extended and corrected as to population from a Table submitted to the Committee of Health in October, 1878 :—

TABLE SHOWING HOSPITAL BED ACCOMMODATION.

Year.	Parish.			Glasgow Royal Infirmary.	Local Authority.			Total Beds.	Population in 1000's.	Beds per 1000.
	City.	Barony.	Govan.		Parly. Road.	Belvidere Fever.	Belvidere Small-pox.			
1865	100	120	54	200	136	...	...	610	424	1·4
1867	...	120	54	200	136	...	...	510	441	1·1
1869	...	120	54	*235	136	...	...	545	459	1·2
1870	...	120	54	200	250	250	...	874	468	1·9
1872	...	120	...	200	250	250	...	820	499	1·6
1875	200	250	250	...	700	522	1·3
1876	250	250	...	500	523	1·0
1878	+120	250	150	520	524	1·0
1880	120	250	150	520	510	1·0
1881	120	370	150	640	512	1·2
1882	120	220	150	490	531	0·9

Average No. of beds, 612; average population in 1000's, 492; average beds per 1000, 1·2.

In the Memorandum accompanying this Table (see Printed Minutes, 1878, p. 1361) I stated that it was intended to prove “that, while the Local Authority have from time to time added “to their hospital accommodation, there has been a corresponding “withdrawal from the resources of the community of the accom- “modation formerly provided by the Parochial Boards and by “the Royal Infirmary.” This was necessary, as there was a risk of regarding our hospitals as additions to the resources of the city, whereas they were merely endeavours to provide from the city assessments what had hitherto been provided from the parochial assessments and by charity. As this Table showed, we had in 1878 lost 604 beds, and replaced them with 520—the population having meanwhile increased, so that the proportion of beds per 1000 had fallen from a maximum of 1·9 to 1. In order to show

* Washing-house buildings at Glasgow Royal Infirmary fitted up by Police Board at cost of £370, with 35 beds. Patients were sent there by Board at charge of £2 each.

Closed since March, 1878.

the nature and range of the demands upon our accommodation, I have prepared the following statement of the highest and lowest number under treatment at one time in our hospitals:—

TABLE SHOWING HIGHEST AND LOWEST NUMBER UNDER
TREATMENT AT ONE TIME.

BELVIDERE FEVER HOSPITAL—OPENED 25TH DEC., 1870.				
Hospital Year, 1st May to 30th April.	HIGHEST.		LOWEST.	
	Month.	Number.	Month.	Number.
1870-1.	March, . .	366	...	...
1871-2.	October, . .	312	March, . .	74
1872-3.	„ . .	93	„ . . .	43
1873-4.	March, . .	147	July, . . .	23
1874-5.	September, .	325	„ . . .	74
1875-6.	January, .	173	„ . . .	64
1876-7.	December, .	171	„ . . .	43
1877-8.	May, . . .	160	„ . . .	87
1878-9.	November, .	258	„ . . .	76
1879-80.	April, . .	272	„ . . .	111
1880-1.	October, . .	520	March, . .	179
1881-2.	November, .	310	April, . .	127

CITY OF GLASGOW FEVER HOSPITAL, KENNEDY STREET— OPENED 26TH APRIL, 1865—CLOSED 6TH MARCH, 1878.				
1865-6.	December, .	89	...	...
1866-7.	March, . .	57	September, .	Empty.
1867-8.	January, .	108	July, . . .	9
1868-9.	April, . .	140	August, . .	18
1869-70.	September, .	149	July, . . .	92
1870-1.	November, .	327	June, . . .	76
1871-2.	May, . . .	150	September, .	13
1872-3.	March, . .	100	August, . .	13
1873-4.	„ . . .	258	September, .	13
1874-5.	May, . . .	160	„ . . .	4
1875-6.	October, . .	100	July, . . .	15
1876-7.	June, . . .	51	October, . .	Empty.
1877-8.	„ . . .	41	„ . . .	„

On comparing these two Tables we observe some things which require explanation. We find that while we had only 250 beds in Parliamentary Road in November, 1870, we had 327 patients under treatment there; and while we had only 250 beds in Belvidere, we had in March, 1871, 366 patients there. The explanation is, that a bed in all our temporary pavilions, both at Parliamentary Road and Belvidere, represents 1,500 cubic feet of space, which was the old allowance for Fever and Smallpox. In our new pavilions, as in all modern hospitals for infectious disease, a bed represents 2,000 cubic feet. In 1870-1 we had to deal with Relapsing Fever, and, partly under pressure of necessity, partly because that form of Fever does not require so much cubic space, we reduced our scale to 1,000 cubic feet. We thus provided 330 beds at Parliamentary Road, and 358 at Belvidere (12 wards with 24 beds each, or 288 for Relapsing Fever; and 4 wards with 15 beds, and 2 small annexes with 5 beds each, or 70 beds for Typhus)—in all, 688 beds. In the winter of 1870-1, therefore, the necessities of an epidemic of Relapsing Fever, with a proportion of Typhus and Smallpox, required, including the other hospitals, no less than 1,062 beds, every one of which was filled, and, besides, for a time many cases were treated at home for lack of accommodation; and in 1871 the Board had to make arrangements with the Barony Parochial Board to treat their cases of Smallpox until, by the subsidence of the epidemic, Parliamentary Road Hospital was ready for the reception of that disease. In 1870-1, then, we found 2·2 beds per 1,000 of the population insufficient.

In March, 1878, we ceased to treat Smallpox at Parliamentary Road, having completed a special Smallpox Hospital of 150 beds at Belvidere. The number of beds in Parliamentary Road Hospital was cut down to 120, but that Hospital has never been used by us since. Yet, in October, 1880, we find that 520 fever patients were under treatment at Belvidere, while 250 beds still was the extent of Fever accommodation there. The circumstances we had to face were these, and they are instructive as showing the sudden vicissitudes which may arise in the health of a city such as Glasgow. In April, 1880, a milk epidemic of Enteric Fever exploded. In the autumn, before the lingering products of this outburst had left the wards, Scarlet Fever became epidemic.

On 19th April we had 175 patients, a fortnight thereafter 277, a month thereafter 334. On 29th October following we had 520 patients—a bound in six months of 345! To accommodate those 520 patients—of whom 291 had Scarlet Fever, 165 Enteric Fever, 47 Typhus, and 17 Measles, each class requiring isolation from the other—we had only 250 beds properly assigned for them. But, happily, the Smallpox Hospital was adjacent, and all but empty. We, therefore, cut off by a wooden barricade 9 of the Smallpox wards, containing 135 beds, leaving 1 ward with 15 beds for that disease. This gave us 385 beds in all. Into these 135 beds, designed for Smallpox, with 2,000 cubic feet, we put 270 patients, thus reducing the space to 1,000 cubic feet. In the 16 old wards, containing 250 beds, with 1,500 cubic feet, we put 250 patients, including the Enteric and Typhus cases. How does this allowance of space agree with the standards laid down by authorities as requisite for the proper accommodation of infectious disease? The Local Government Board of England prescribes 2,000 cubic feet; and as to the question of reducing this amount in the case of children, Dr. Thorne, in his recent Report to that Board “On the Use and Influence of Hospitals for Infectious Diseases,” says:—“I am of opinion that if any reduction in ward space is made in the case of children, the reduction should be but small, and that in no case should the space for a child in an infectious hospital be less than three-fourths of that which is deemed necessary for an adult” (p. 15). It follows, therefore, that 1,500 is the minimum cubic space for children, and, therefore, that a ward designed for 15 patients at 2,000 cubic feet would hold 20 at 1,500. Applying these data to those 520 patients, how many beds on the scale of 2,000 feet adopted in our new pavilions would have been required to accommodate them properly? In our Police Bill we have enacted that persons aged 8 years and upwards shall be regarded as adults in calculating the necessary cubic space for healthy people in dwelling-houses. I find that, of these 291 Scarlet Fever patients, 158 were under 8 years, and 133 aged 8 years and upwards. Giving the former the allowance of 1,500 cubic feet necessary for children sick of infectious disease, the latter 2,000 required by adults, and the Measles cases 1,500 cubic feet, and expressing the requirements of all the patients in wards such as we are now erecting, our

Fever Hospital accommodation in October, 1880, ought to have been this:—

165 Enteric Cases,	... ..	= 11 Wards	× 15 Beds,	or 165 Beds.
47 Typhus ,,	... ..	= 3 ,,	× 15 ,,	or 45 ,,
158 Scarlet ,,	under 8 years,	= 8 ,,	× 15 ,,	or 120 ,,
133 ,,	{ aged 8 years and upwards, }	= 9 ,,	× 15 ,,	or 135 ,,
17 Measles ,,	under 8 years,	= 1 ,,	× 15 ,,	or 15 ,,
<hr/>		<hr/>		<hr/>
520 Cases.	Total,	32 Wards.	480 Beds.	

We have thus obtained two indications from recent experience of the extent of accommodation which may be required for infectious disease in Glasgow—one in 1870-1, and one in 1880-1. The emergency arose in the former case from Relapsing Fever. We may set aside that experience as phenomenal for two reasons—(1) Because Relapsing Fever has only visited this country at intervals of from 12 to 15 years; (2) because, undoubtedly, the excessive demands of 1870-1 arose from the Fever outrunning our accommodation, which it could never do if we were provided with the permanent hospitals with sites for temporary extension, which are indicated by the more recent and normal experience of 1880-1.

Let us therefore confine our attention to 1880-1. For a reason to be subsequently stated, I take no account of the 150 beds in the Smallpox Hospital, of which 135 were taken over for Fever in 1880. Barely to accommodate the fever patients then under our care, we ought to have had 16 pavilions such as are now being built at Belvidere, containing 32 wards and 480 permanent beds—*i.e.*, five pavilions additional to the 11, the erection of which is already determined upon and partly carried out.

Here the all-important questions arise, and must be discussed—Is our experience an adequate and safe guide for the future? Will the relation of the Local Authority to infectious disease be the same in the future as in the past? Is there a reasonable probability that the same amount of disease will require to be provided for in hospital, or a greater? There is positive evidence that the proportion of the infectious disease of the city, treated in our hospitals, is growing from year to year; and it may be anticipated

that under a system of compulsory notification, a still greater impetus will be given to this tendency.

(1.) *Evidence that Hospital Treatment is growing in favour with the population of Glasgow.*—I shall take the statistics of two diseases—Enteric Fever and Scarlet Fever. Typhus and Smallpox fall almost entirely into our hands—the former from the poverty and dependence of the majority of its victims, the latter from the alarm attaching to it, and the stringency which its extreme contagiousness justifies us in compelling removal. As to Measles and Hooping-cough, while hospital treatment must be applied in special circumstances, we must look to exclusion from schools as the main defence against their spread. But without going into any special inquiry, I may state that the lodger class of the population, and the poor generally, are more and more looking to us for shelter and treatment for their children, in all forms of infectious disease—even the minor, such as Chicken-pox. The eruption of Chicken-pox, and the cough of Hooping-cough, lead to the exclusion from lodgings of those who have no home of their own, and the majority of the cases of those diseases treated, either apply in person under those circumstances, or are recommended by medical men for removal. In these cases we are legally bound to receive any disease which is infectious, including Erysipelas, Diphtheria, and Puerperal Fever. Enteric Fever affects a better class of people, and an increase in the proportion of total cases treated by us would be a strong proof of the growing popularity of hospital treatment. At present we have certain knowledge only of fatal cases of infectious disease. Under compulsory notification we would know of all cases, and could state absolutely what proportion of the whole were removed to hospital. The proportion of the total deaths from any one infectious disease which occurs in hospital is the only approximate estimate we can make of the proportion of the total cases treated there. The tendency of this method is to over-estimate the proportion of cases treated in hospital, because the same causes which make the general death-rate of the poorer classes higher than that of the well-to-do, produce more deaths out of the same number of cases of special disease among the former than among the latter. But the error is a uniform one, and any comparison from year to year is logically sound. I shall take the statistics from 1872 onwards, because in that year the Parochial

Boards gave up treating infectious disease,* and add the deaths in the two Infirmeries. I shall then contrast the percentage of the total deaths registered in each year by the Registrar-General which took place in hospital.

PROPORTION OF DEATHS FROM ENTERIC FEVER WHICH
OCCURRED IN HOSPITAL.

	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881
Total Deaths,	198	249	211	284	210	184	208	134	279	175
In Hospital,	47	49	45	81	50	40	61	32	109	66
Percentage,	23·7	19·7	21·3	28·5	23·8	21·7	29·3	23·9	39·0	37·7

The growing proportion of the total cases treated in hospital is obvious from those figures. It becomes plainer if we divide those ten years into two periods of five years. In the first five there were 272 out of 1,152 deaths, or $23\frac{1}{2}$ per cent. in hospital; in the second five there were 308 out of 980, or $31\frac{1}{2}$ per cent. in hospital.

Let us deal with Scarlet Fever in the same way. This is a disease for which hospital treatment was popularly unknown ten years ago. It is now recognised by sanitarians as one to which isolation must be applied, and for which hospital accommodation must in the future be provided and its use enforced. The following are the statistics of this disease in Glasgow during the same period:—

PROPORTION OF DEATHS FROM SCARLET FEVER WHICH
OCCURRED IN HOSPITAL.

	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881
Total Deaths,	362	577	1673	732	313	137	190	249	462	255
In Hospital,	6	26	165	81	30	20	31	52	109	58
Percentage,	1·6	4·5	9·8	11·0	9·6	14·5	16·3	20·9	23·6	22·7

* These Tables are compiled from the Registrars' books, so that they accurately show in each year the number who died in hospital of the total deaths registered from each disease. The Royal Infirmary still treats a few enteric patients, and also the Western Infirmary, in the general wards. Any deaths among these patients are included.

The growing proportion is much more marked in the case of Scarlet Fever than of Enteric Fever. Again, contrasting the two periods, we find that in the first five years there were 308 out of 3,657 deaths, or $8\frac{1}{2}$ per cent., in hospital; in the second five years there were 270 out of 1,293, or 21 per cent., in hospital.

(2) *What will be the effect of compulsory notification upon the proportion of cases treated in Hospital?*—The question might be answered on general principles, but the conclusion arrived at by Dr. Thorne from his investigation in England, taking “Scarlet Fever as the type of the infectious Fevers calling for isolation provision,” is this:—“Those districts where the largest proportion of attacks was isolated, in so far as attacks can be judged of by total mortality, were those in which some early information was procurable as to the occurrence of the several attacks.”*

There can be no doubt, therefore, that a larger *proportion* of the total infectious disease in the city will come into the hands of the Local Authority for hospital treatment. But in estimating the extent of accommodation required we have to provide, *not for proportion but for absolute number*. Prevention is the aim and the *raison d'être* of hospitals and sanitary organisation; and the evidence of the success of prevention, in so far as isolation is concerned, is and may be formulated as an increasing proportion isolated of a diminishing total quantity of infectious disease existing. The acme of this success will be the largest proportion isolated of the smallest quantity of disease existing. It is very gratifying to find that, even without compulsory notification, simply from the consistent and continuous pressure of hospital treatment, supplemented by the general home operations of the department, there is in the above statistics of Enteric Fever and Scarlet Fever ample evidence of the progress of this preventive success. In the case of Enteric Fever the total deaths in the second period are 15 per cent. less than those in the first, so that the larger proportion of the smaller aggregate gives 308 deaths in hospital in place of 362 if the aggregate had not been diminished. In the case of Scarlet Fever the total deaths in the second period are $64\frac{1}{2}$ per cent. less than those in the first, so that the larger

* Report, p. 24.

proportion of the smaller aggregate gives only 270 deaths in hospital in place of 764 if the aggregate had not been diminished.

These figures are very instructive. They prove as regards the question in hand—(1) That the first effect of compulsory notification will be to increase the absolute amount of hospital accommodation required; (2) that ultimately the increment of hospital cases from the growing proportion will be balanced by the decrement in the total cases, and the accommodation required diminish. The experience of the last ten years seems to show that Scarlet Fever has already entered upon the latter stage; but I would point out that it is the great epidemic outburst of 1874 which turns the scale in favour of the last five years, and as this disease tends notably to such outbursts as successive generations of unprotected children spring up, it would be rash to infer that we have yet permanently turned the scale. It is satisfactory to have positive evidence of progress in that direction in the case of two grave diseases of the infectious class.

In the case of Typhus and Smallpox, the following Tables show that we have already reached the point when the increasing proportion of cases treated in hospital produces a smaller number, owing to the decrease in the total amount of existing disease:—

PROPORTION OF DEATHS FROM TYPHUS FEVER WHICH
OCCURRED IN HOSPITAL.

	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881
Total Deaths,	182	68	113	96	92	70	39	58	43	50
In Hospital,	90	35	59	51	61	52	33	45	28	37
Percentage,	49·5	51·5	52·2	53·1	66·3	74·3	84·6	77·6	65·1	74·0

In the first period of five years there were 296 deaths in hospital out of 551, or 53·7 per cent.; in the second period of five years 195 deaths in hospital out of 260, or 75 per cent. In the second period the total deaths in the city was 53 per cent. less than in the first period, so that in place of 413 deaths in hospital—which there would have been had the total amount of the disease not been so much reduced—there were only 190.

In the following Table of Deaths from Smallpox I have included 12 years, beginning with 1870, when the epidemic commenced:—

PROPORTION OF DEATHS FROM SMALLPOX WHICH
OCCURRED IN HOSPITAL.

	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881
Total Deaths,	18	205	137	223	221	2	7	11	2	...	2	2
In Hospital,	4	89	92	170	163	...	6	10	...	...	2	1
Percentage,	22·2	43·4	67·2	76·2	73·8	0·0	85·7	90·9	0·0	0·0	100	50·0

In the first period of six years there were 518 deaths in hospital out of 806, or 64 per cent.; in the second period of six years 19 deaths in hospital out of 24, or 79 per cent. In the second period the total deaths in the city was 97 per cent. less than in the first period, so that in place of 639 deaths in hospital—which there would have been had the total amount of the disease not been so much reduced—there were only 19.

(3) *The element of a growing population must be taken into account.*—The mean population in the five years 1872-6, was 514,784; in the five years 1877-81, 517,652. This increase of 3,000 makes the statistics given above still more encouraging. I think it may be anticipated that if, in an urban community such as Glasgow, with compulsory notification, the Local Authority set out with adequate permanent hospital provision on sites well chosen and ample enough for temporary extension in emergencies such as may arise, and an active general sanitary organization co-operating in the homes of the people, the progress which may be legitimately looked for in the prevention of disease will compensate the necessities arising from a growing population, and keep their hospital requirements at a permanent level, if it does not even cause them to diminish.

Let us now, in the light of these facts, endeavour to grapple with the question of the aggregate hospital accommodation necessary for Glasgow, with its population of 531,200 in the year 1882. I have excluded any allusion to the requirements of

Smallpox, and hitherto dealt with the Fevers separately—and for this reason. From the results of the Royal Commission “appointed to inquire respecting Smallpox and Fever Hospitals” in the Metropolitan Asylums District, it is evident that hospitals for Smallpox must be dealt with entirely apart from those for Fever. The former must be distributed and used in a way which renders them unavailable for Fever, or, at least in the presence of Smallpox, not available for Fever. I refer to the Report for the evidence of this conclusion. It is too intricate and voluminous for quotation here. It is more instructive to state what are the recommendations of the Commission as to the necessities of the population of 3,814,571 within the Metropolitan District, as determined on this evidence. They recommend for Smallpox 2,100 beds, on several sites (with space for temporary extension to 2,700). For Fever 3,000 beds. As to the distribution of these beds their recommendations are of the greatest importance, but I shall consider at present only how far this aggregate of 2,100 beds for Smallpox, and 3,000 for Fever, affords a standard applicable to Glasgow. London is not comparable with Glasgow in the social and sanitary character of its population. I should have preferred to look for guidance to large commercial and manufacturing populations, such as those of Liverpool and Manchester, but the authorities there have not yet learned the true policy for dealing with infectious disease. They trust to parochial boards and general hospitals, and are satisfied with very inadequate arrangements. Out of London nothing is known of large hospitals for infectious disease. London is itself at present distracted with division of sanitary jurisdiction, but the scheme of the Royal Commission is based upon the constitution of one central sanitary authority—distinct from the parochial organisations—one of whose functions shall be to treat infectious diseases within the area of the rates, whether in the persons of paupers or not. This is precisely the Glasgow policy. What, then, is the proportion of beds to the population of London, represented by the recommendations of the Royal Commission? The following Table shows the proportion, and gives the number of beds on the same scale for Glasgow at its present population:—

Smallpox,	2,100 Beds,	·55 per 1,000,	=	Glasgow, 292 Beds.
Do.,	2,700 „	·707 „	=	„ 376 „
Fever,	3,000 „	·78 „	=	„ 414 „

We have seen that, in 1880, to accommodate the 520 patients then under our care, with no Hooping-cough, Diphtheria, or other miscellaneous diseases to isolate, we would have required 480 Fever beds. This is .94 per 1,000 of the population at that date, and means, therefore, 500 beds for the present population.

In order to show the extent and variety of the work done by our hospitals in the past, I have prepared and appended a Table which shows the total number of cases treated in each hospital in each year, distinguishing the diseases and showing the mortality from each disease. I have also constructed a Table from this statement exhibiting the percentage of the various diseases to the total treated in each year, exclusive of Smallpox, in order to show how, from the variety of the diseases to be treated, each requiring separate accommodation, we cannot fit in, so to speak, our cases to our beds, so that *all* our beds shall be occupied. Therefore, we must allow a surplus over those 500 beds for such diseases as Hooping-cough, Diphtheria, Erysipelas, and doubtful cases, or cases of mistaken diagnosis.

I am quite conscious of the difficulty of estimating for these and other future uncertainties, such as the results of compulsory notification and growing popularity of hospital treatment; but, in view of our local experience, of the opinion of the Royal Commission as to the requirements of the healthy population of London, and of the future of Glasgow, my opinion is that the minimum aggregate Fever requirements of Glasgow cannot be estimated at less than 550 to 600 beds. As to Smallpox, we have a hospital with 150 beds, and we must trust that in the future, by attention to the enforcement of the Vaccination Act and stringent application of isolation, with the enlarged opportunities of compulsory notification, we may be as moderate in our necessities as regards this disease, in comparison with London, as we have hitherto been. But I shall subsequently point out the additional facilities for meeting emergencies which the policy of distribution of our fever beds in more than one site will give. Meanwhile, it may be noted that the aggregate hospital accommodation recommended by the Royal Commission for London equals 1.33 per 1,000 of the population, with space to extend to 1.48, and the aggregate which I recommend for Glasgow is 1.31 to 1.41.

II. *Ought all the epidemic bed accommodation of Glasgow to be concentrated in one place, or ought there to be more than one hospital?*

Before considering the general question, it is necessary to deal with the allegation frequently made, that the estate of Belvidere was purchased with the intention of making it the site of the sole epidemic hospital of Glasgow. If so, then the general question was settled in 1870, and it would be necessary to show wherein circumstances had so altered that it must be reconsidered. When it became apparent that the site in Kennedy Street (off Parliamentary Road) was insufficient, a sub-committee was appointed to look out for another. Several sites were pointed out as eligible—at Oatlands, on the northern slope of Mount Florida, in Garscube Road, &c. It was thought desirable to ask the President of the Faculty of Physicians and Surgeons (Dr. J. G. Fleming) to choose two Fellows, to form, with the official medical advisers of the Board (Drs. Gairdner, Dunlop, and Russell) a Medical Committee to visit and report upon these sites. The Fellows selected were Dr. Jas. D. MacLaren and Dr. Moses Thomas, Superintendent of the Royal Infirmary. In their Report they said:—"We consider it our duty to suggest to the Health Committee of the Police Board that they should keep in view the necessity which in all probability will ultimately arise of making provision for more than one permanent Fever hospital for a city of such large and increasing population as Glasgow." None of the sites before this committee were chosen. The exhaustion of all available accommodation by the then prevalent epidemic of Relapsing Fever forced the Board to further exertions, and the purchase of Belvidere was agreed to at an extraordinary meeting, held 11th Nov., 1870. At that meeting the following Report was read:—

"Sanitary Chambers, 1 Montrose Street.
"10th November, 1870.

"The undersigned have this day visited the estate of Belvidere, situate on the north bank of the Clyde entering from London Road, and are of opinion that the southern part of the property is suitable for the site of a permanent Fever hospital, but its distance from an extensive portion of the city would render it

“ necessary that the present hospital in Parliamentary Road, or
 “ some other adapted in point of situation for the reception of
 “ patients from the northern and north-western districts, shall
 “ continue to be available in future.

“ J. G. FLEMING, M.D., Pres. Fac. Phys. and Surgeons.

“ JAS. B. RUSSELL, M.D.

“ JAMES DUNLOP, M.D.

“ W. T. GAIRDNER, M.D.”

In his speech proposing the purchase of Belvidere at this meeting, Lord Provost Arthur argued in favour of this as a site for the southern part of the city, because “in the north part of
 “ the city they had the Infirmary, the Barony Poorhouse, and
 “ our own Fever Hospital;” and he said that, in view of the ample provision for the north, the hospital in Kennedy Street might ultimately be withdrawn and “substitute a new hospital in
 “ the west or south-west.” It is evident, therefore, that so far from Belvidere being, in 1870, destined either by the Board or their advisers as the sole hospital for Glasgow, it formed part of a scheme of several hospitals, partly municipal, partly parochial, and in connection with the Royal-Infirmary.

On 17th July, 1871, we find from the Minutes of the Board of Police that—“On the motion of Mr. Collins, the Board remitted
 “ to the Committee on Health ‘to consider whether the time has
 “ ‘now arrived when the Fever Hospital in Parliamentary Road
 “ ‘could with propriety and advantage be discontinued, and all
 “ ‘cases treated at Belvidere, and to report.’” At next meeting the Committee reported the result of their deliberations on this motion as follows :—“On remit by the Board, the Committee had
 “ under consideration the propriety of discontinuing the Hospital
 “ at Parliamentary Road, and report that, for some time past,
 “ they have had in view the desirability of treating all patients
 “ at the Belvidere Hospital, and disposing of the ground at
 “ Parliamentary Road, for which the large feu-duty of £802 per
 “ annum is payable, but that they had delayed making any
 “ recommendation on the subject on account of Smallpox—all
 “ patients suffering from that disease being treated there. The
 “ committee, however, hope to be able to report before Whit-
 “ sunday next as to the discontinuance of the hospital and the
 “ sale of ground.”

In 1872 the Board had become convinced that it would be necessary to abandon the use of the hospital in Kennedy Street for the treatment of Smallpox, and to consider the question of erecting a Smallpox hospital on the lands of Belvidere. This proposal was remitted to Dr. Gairdner, Mr. Carrick, and myself, for consideration, and a Report was made and printed—"as to site for Smallpox Hospital at Belvidere, with addendum on proposed sale of the site of Parliamentary Road Hospital," dated 22nd July, 1872. The latter part of this Report bears so directly upon the question of the sale of this site, which is again before the Board, that I quote it *in extenso* :—

* * * * *

"The terms of the remit on which we have reported above seem to imply a resolution on the part of the Board both to abolish Parliamentary Road Hospital and to dispose of its site. This we think a procedure so serious, and so much open to objection, that, although it is beyond the scope of the remit, we must put our opinion on the matter before the Board.

"The site of the Hospital at Parliamentary Road is more central in situation and more easy of access from all parts of the city than any site which could now possibly be obtained; in fact, if this site is abandoned, then on no future occasion, however urgent the circumstances, can hospital accommodation be provided within (probably) two miles of the Cross. The lands of Belvidere are two miles from the Cross, and three to four miles from other parts of the city to the west, south, and north.

"Such urgent circumstances have been experienced at a comparatively recent period; and the undersigned have a vivid recollection of the difficulties encountered in 1866, even with Parliamentary Road as the active centre of administration—a part which could never be played by the organization of Belvidere—in obtaining sites for district cholera hospitals near the main masses of the people. It may be noted in reference to cholera, that this disease is now diffusing itself over Russia, and is already causing some anxiety on account of this country. But we do not wish to make strong use of this argument of present danger; we urge the importance of retaining at least a part of the site off Parliamentary Road on much broader grounds of expediency. The annual cost of such a site ought to be regarded in the same light as a premium of insurance. No one will grudge the expenditure when the necessity arises for its use, and in that event present economy would be found to be costly. The dimensions of epidemics, and the consequent expense, are just in proportion to the activity and thoroughness of the

“preventive measures adopted at their outset, and of these the most important is prompt isolation.

“In this connection we would also remind the Board that in a report on hospital sites, made to them shortly before the purchase of Belvidere, by a committee of medical men appointed by the Board for that purpose, these gentlemen say:—‘We consider it our duty to suggest to the Health Committee of the Police Board that they should keep in view the necessity which in all probability will ultimately arise of making provision for more than one permanent Fever Hospital for a city of such large and increasing population as Glasgow.’

“We are of opinion, for these reasons, that the site off Parliamentary Road ought not to be wholly abandoned. If the northern half of the site could be disposed of to advantage, we think the object we have in view would be sufficiently attained by retaining the southern half, or the hospital as it was originally designed, containing 130 beds.

“There are matters of detail in regard to which we might have suggestions to make, but which need not be entered upon in this report.

“W. T. GAIRDNER, M.D., *Medical Officer.*

“JOHN CARRICK, *Master of Works.*

“JAS. B. RUSSELL, M.D., *Physician-Superintendent of Hospitals.*”

After hearing this report, the Health Committee divided upon a motion for the erection of a Smallpox Hospital at Belvidere, and “that thereafter the northern portion of the ground at Parliamentary Road should be sold, and the southern portion with the erections thereon retained to meet any emergency that might arise,” and an amendment “that in the meantime no portion of the ground on which the hospital is erected at Parliamentary Road should be sold,” and that the same reporters should be asked to advise as between treating Smallpox in Parliamentary Road or in a new hospital at Belvidere. The amendment was carried by nine to five votes. On 30th September, a report in favour of the new hospital at Belvidere was read, and the Board resolved accordingly. Plans were ordered to be prepared, but the subsidence of Smallpox to a vanishing point each autumn led to delay. In November, 1873, the Board sent a deputation to England to get information about such hospitals. The ground was not broken until November, 1874, and the hospital was opened 4th December, 1877. Parliamentary Road Hospital was closed 6th March, 1878.

This hospital has not since been used for the treatment of infectious disease. It has been kept, in spite of local opposition—to which I shall more fully allude—as a reserve, and on two occasions the Board actually resolved to reoccupy it in emergencies which, however, were tided over without carrying out this resolution. In October, 1878, when I submitted the memorandum referred to at the beginning of this report, the Committee of Health made the following minute:—

“The Committee having considered above Memorandum, and
 “fully deliberated on the whole subject, agreed to recommend,
 “*in the event of an emergency arising during the ensuing*
 “*winter or spring months for increased accommodation, the*
 “*Hospital at Parliamentary Road should be used for the treatment*
 “*of Fever cases,* and in such an event occurring that the Medical
 “Officer and the Master of Works be authorised to make all
 “necessary arrangements.” It was also resolved to proceed with
 the erection of four new permanent pavilions at Belvidere; and a
 sub-committee was appointed “to look out for ground in the
 “northern district for the erection of a District Hospital.” This
 sub-committee has been reappointed from time to time, and has
 recently reported that a convenient site cannot be got within our
 boundary, and that to obtain one outside we must either combine
 with a rural Local Authority or obtain Parliamentary powers to
 go outside.

In the autumn of 1880, in the circumstances also already
 described, during my absence in America on sick-leave, an extra-
 ordinary meeting of the Committee of Health was held, at which
 Dr. Allan submitted a Statement showing that his Fever Wards
 were full, while the new pavilions were not yet ready for
 occupation. It was then resolved to occupy nine of the Small-
 pox wards for Scarlet Fever and “to get the unoccupied portion of
 “the Hospital at Parliamentary Road repaired and put in order,
 “so that it may be available for patients if required. The
 “Committee also appointed a sub-committee, consisting of Bailie
 “Mowat and Councillors Lamberton and Richmond, along with
 “Dr. Allan (Councillor Lamberton, convener), to co-operate with
 “the Master of Works in carrying out their directions, with
 “powers.” I have shown how, by overcrowding the wards at
 Belvidere, the occupation of Parliamentary Road Hospital was
 avoided.

Meanwhile, and traversing all those endeavours of the Board and its officials to treat the question on the grounds of public policy, a persistent agitation has been maintained in the ward within which Parliamentary Road Hospital stands to get rid of it entirely. The financial argument has been urged in the Council in favour of this movement; but the central motive of the agitation outside the Council has been the purely selfish desire to remove an object of popular annoyance and alarm—an hospital for the treatment of infectious disease in proximity to dwelling-houses. The most recent resolution of the Fifth Ward Municipal Committee shows this clearly. It is to this effect:—"That this Committee, observing with deep regret that, notwithstanding the frequent protests of the inhabitants of the north quarter, and the oft-repeated promises of the Town Council to remove the Parliamentary Road Fever Hospital, the greater portion of the buildings still remain, hereby again strongly condemn the policy of the Council in taking no decisive action in the matter, and knowing the increasingly strong feeling which exists in the ward on the question, *and which they fear may exhibit itself in an undesirable manner* [the italics are mine], earnestly hopes that immediate steps may be taken for its entire removal."

There is no attempt to reason as to the "policy of the Council," which, inasmuch as it is based upon no desire to annoy the locality, but simply to do what is best for the community at large, merits some such consideration. It is not that the site has become insalubrious through increase of public works, nor that, recognising the justness of the "policy" of having a northern hospital for their use as inhabitants of the northern district, and remembering that the Fever Wards of the City Parish, and the Fever House of the Royal Infirmary, which formerly existed in this district, have now been abandoned, they would urge the immediate purchase of a site which, while convenient to their district, would be better suited for sick people. No such reasonable course is adopted, but without the slightest indication that the Local Authority has a serious responsibility laid upon them by law, and that the existence of this hospital has hitherto been regarded as necessary to enable them to discharge themselves of this responsibility, the mere presence of these empty pavilions is offensive, because, while they stand they may be used, and if they were swept away the local mind would be at ease on

that score, whoever might suffer. But it may be said this local agitation against the treatment of infectious disease in Parliamentary Road Hospital is founded on no mere sentiment, but upon positive experience of injury. I admit that when and so long as this hospital was used for the treatment of Smallpox there were facts which warranted uneasiness as to the influence of the hospital upon the local health; but the Board gave effect to their suspicions by erecting a Smallpox Hospital at Belvidere and resolving to abandon the use of Parliamentary Road Hospital for that disease. In so far, therefore, as the alarms of the Fifth Ward were reasonable they have been respected. Is there a single fact to warrant even a suspicion that this hospital has been a local centre of infection for any other disease than Smallpox? Not one. We have treated every other infectious disease there, from Cholera to Measles, Typhus Fever in thousands, Relapsing Fever, Enteric Fever, and Scarlet Fever in hundreds, and these diseases have not spread in the vicinity. In point of fact the whole district has been singularly free from them. The experience of other towns has been exactly the same. In an elaborate Report upon the "Use and Influence of Hospitals for Infectious Diseases," issued by the Local Government Board of England a few weeks ago, the Medical Officer stated that, after inspecting some seventy such hospitals "of every variety of locality, size, and construction," and used for all sorts of infectious diseases—some for many years, some with obvious defects of situation, and even of management—there is no experience of local injury excepting from Smallpox. The history of the London Fever Hospital is specially remarkable, as that of the oldest infectious hospital in the country. It was opened in 1802, transferred to its present site in 1849, in both begirt with dwelling-houses. In these circumstances many thousands of every variety of fever have been treated. The hospital is still in use, and, on the basis of special investigation, it is stated that no injury has been inflicted upon the neighbourhood.

I have thus fully dealt with the merits of the agitation of the Fifth Ward against the existence of Parliamentary Road Hospital, because I am desirous to strip it of any claim for respect on the ground of a genuine local grievance. There is none. Therefore the Board may calmly consider the utility of this hospital as a part of the standing defence of the community, and deal with it on that ground and no other. In this respect my position is that

which it has always been, and cannot be better expressed than in the words of the following letter, dated 6th September last, and addressed to D. Fortune, Esq., Secretary, Fifth Municipal Ward Committee:—

“My Dear Sir,—I am in receipt of yours of yesterday’s date, conveying copy of resolution of Fifth Municipal Ward Committee, relative to the continuance of Parliamentary Road Fever Hospital. I, of course, can only advise in this matter, but I recognise the courtesy of the committee in thus informing me of their opinion.

“It may be well to explain meanwhile the position I take with reference to the question. I think, in view of the requirements of such a large community, we ought to have at our disposal an epidemic hospital in the north quarter of the city. I should be pleased to see it situated in the northern outskirts, but I cannot advise the total abandonment of the old site until a new is secured. The hospital has, however, been reduced to half its former dimensions.

“I can assure your committee that, so far as I have influence, Parliamentary Road Fever Hospital will never be used for the treatment of infectious diseases except in circumstances of extreme pressure, when the inhabitants of the north quarter would be most benefited by its use.

“I may also say that the matter of securing a new site engages the attention of the Health Committee, and the success of their efforts means the final fulfilment of your wishes.—I am, dear Sir, yours truly, (Sgd.) JAS. B. RUSSELL.”

I retain the position taken by the Medical Committee, who advised the Board in the purchase of Belvidere, and which has been held by all the official advisers of the Board since. Is there any change in the circumstances of the city which warrants a change in the scheme of 1870? In the earlier part of this Report I have specified various important changes, but they all tend to confirm the wisdom of that scheme, by furnishing new and cogent reasons for adhering to it. Several local hospitals have been abandoned. We bear alone a responsibility which used to be shared by the Royal Infirmary and the Parochial Boards. By our own action in pushing hospital treatment against forms of infectious disease, for which hospital treatment was never thought of some years ago, we have increased that responsibility to an extent which we have not yet experience enough to estimate. We are on the eve of applying for compulsory notification of infectious disease, the possible results of which, in adding to the demand for

beds, we cannot foresee. In the course of a few years we may find that by the success of these measures we may so stamp out epidemics as to diminish the average requirements of hospital accommodation, but we cannot hope for such a result unless we have at the outset a provision in excess of past experience of our necessity. In any case the future is so uncertain that to divest ourselves of Parliamentary Road site, except by substitution of another, would be, to say the least of it, a dangerous experiment.

But we are anticipating. We have got thus far towards a decision on the alternative—distribution or concentration of the accommodation for the infectious disease of Glasgow—that hitherto the northern site has been an integral part of our provision, and that so recently as 1880, it was resolved to occupy Parliamentary Road, and it is evident that we ought to have done so. It may be said, and it is said—it was resolved to use the northern hospital, but simply because the hospital at Belvidere was insufficient. We have 30 acres of ground there; increase the size of the hospital, and make it sufficiently large to meet all requirements.

In a Hospital Report published in 1873 I said of this Belvidere estate—"I believe there never has been such a noble provision "made by any community for its fever-stricken poor." I have, since this was written, seen nearly all the chief fever hospitals in the kingdom, and am of the same opinion still. I doubt if we could find in or near Glasgow another site so well adapted by position, and which is so unlikely to be much deteriorated in suitability for infectious hospital purposes; but we must have a care to use it wisely. The question is—To what extent can this or any other single site be made the sole hospital for Glasgow? Have any general principles been established, as regards the nature of the disease, the proportion of beds per acre, which is safe, or the limitation of size consistent with efficient management?

(1) *As to the requirements of the various epidemic or infectious diseases.*

Cholera is a disease to which hospital treatment is inapplicable, unless the hospital is beside the patient. It would be fatal to a Cholera patient to remove him or her to a distance. Therefore, unless every part of a community is within a radius of half a mile of the hospital, one would not suffice. What this means in the case of Glasgow, covering an area of over nine square miles, cannot be

better exhibited than by quoting from my Hospital Report for 1866-7, an account of the arrangements made in 1866, when we handed over our Fever cases to the Parochial Boards and Royal Infirmary, and took the entire responsibility for anticipated Cholera:—"As the result of a minute inspection of London and " Liverpool, especially the former, while Cholera was at its height " there, Dr. Gairdner and Mr. Carrick were impressed with the " necessity of making this provision immediately, and of making " it by means of *district* hospitals, so placed as to reduce the evils " of removal to a minimum. They found that six points could be " chosen within the municipal boundary, so situated relatively to " each other that a circular area round each, with a radius of half " a mile, would include every part of the more densely populated " city. A hospital being erected at each of those points, the " practical result would be to place every inhabitant of those " portions within half a mile of a bed, and appliances suitable for " treatment in case of illness. The proposed sites were Landressy " Street, Bridgeton; corner of Ardgowan Street and Watt Street, " South Side; Greendyke Street; Cranstonhill, Anderston; the " Round Toll, and this hospital, Parliamentary Road, for the " northern quarters. Of these, the hospital at Greendyke alone " was completed, that at Cranstonhill was commenced, and the " scheme proceeded no further." In so far as this scheme was developed, Parliamentary Road Hospital was the working centre, where the nurses lived, where the stores were kept, and whence they were distributed, from which the ambulances were sent out. If we should ever have the misfortune to find ourselves face to face with Cholera again this is the sort of provision we should have to make for Glasgow. Parliamentary Road is the only hospital we have at present which would be of essential use in such a scheme. Belvidere would meet the necessities of Parkhead; and where we could now plant small district pavilions, especially if the common good was jeopardised by local sentiments, such as those of the Fifth Ward, it would be hard to say. We may dismiss the subject with the hope that our good water supply may prevent the occasion for practically solving the problem from ever arising.

Smallpox is another infectious disease which, for another reason, cannot be concentrated in one hospital, if it prevails in a large community. When I come to quote the recommendations of the Royal Commission for London, the practical results of this con-

elusion will be sufficiently apparent. Into the reasons for this conclusion it would scarcely be prudent to enter here in detail. They will be found in the report and evidence of this Commission, to which I refer. Somehow or other concentration of Smallpox patients, beyond a very limited number, begets a condition of danger to proximate inhabitants, whether of the general community or, *of the sick in adjacent hospitals*. An isolating zone of clear space, which is not required in the case of any other disease, must therefore be maintained around every Smallpox hospital. The practical bearing of this fact upon the utilization of Belvidere for Fever purposes is this. We have there our Smallpox hospital with 150 beds. This we shall see is in excess of the number of cases which, according to present evidence and under present methods of construction and ventilation, may be aggregated without begetting the condition of danger to the neighbourhood. Therefore we must not surround this hospital closely with Fever pavilions, or with administrative buildings. *We must also consider whether anything can be done to prevent the approximation of tenement houses to our western boundary.*

As to the other infectious diseases, nothing has yet been observed in their nature and habits, when aggregated under good general hygienic conditions and efficient general management, to warrant even a suspicion that aggregation *per se* is a source of danger to a populous neighbourhood.

(2) *Beds per acre*.—Has any general principle been established from experience of existing infectious hospitals (excluding those for Smallpox) on the basis of beds per acre of their site, which might be applied to the determination of the size of hospital proper for any given site? Dr. Thorne has made an approach to a rough generalization from his observations on the 67 English provincial hospitals which he inspected. This is his statement:—

“Amongst the hospitals visited and where these several necessary conditions have been fulfilled, I would name those in the Bradford, Cheltenham, Tonbridge and Warrington urban districts, in the Berkhamstead and Solihull rural districts, and that belonging to the Weymouth port authority. In none of these instances does the number of patients per acre exceed 20. As typical of the reverse conditions, the wooden pavilions at Birmingham which are deemed to suffice for the purposes of some 70 patients

“per acre, and the three-storied buildings at Salford, where some 65 patients per acre are accommodated, may be specially noted.”

The value of these rates per acre as applicable to large hospitals is entirely dissipated when we discover that the hospitals from which these rates are derived range in their total bed accommodation from 8, the smallest, to 68, the largest! To reason from an average based upon such examples to a site of 30 acres would be to fall into the same fallacy which lurks in the attempt to justify from the Peabody buildings, inhabited by from 235 to 1600 to the acre, a like density of population to the acre in Glasgow. The capacity of a site must be determined by other considerations such as those enumerated by Dr. Thorne:—“It became increasingly apparent as the inquiry progressed that in determining the size of a site special regard should be had to—1st, the reasonable seclusion of the hospital buildings; 2nd, the provision of ample space both as regards the buildings and the number of patients to be received into them; and 3rd, the need for future permanent extension of the hospital buildings, in case of an increase in the population, or of the erection of temporary means of isolation in the event of any epidemic prevalence which may result from inability or failure to isolate first cases of disease.”

If we endeavour to reduce these generalities to precise measurements, we find that (speaking only of *Fever* hospitals) the breadth of the isolating zone between the buildings and the public cannot be more definitely stated than in the words “reasonable seclusion,” with, “as a rule, a substantial wall or close fence at least 6 ft. 6 in. high.” As to “ample space as regards the buildings,” this is obtained by securing “that the distance between the several pavilions, and between them and the administrative block, should, if possible, be equal to one and a half times their height when the buildings are of equal height, and, if otherwise, at least equal to the full height of the higher of the two adjacent buildings.” The pavilions should be one-storied, and there should be 2000 cubic feet of air space and 144 square feet of floor space to each patient. In short, the practical result of the whole matter when determined on this basis is, as regards *Fever* hospitals, that which was so well expressed by Miss Nightingale twenty years ago as regards general hospitals:—“The next point is to determine what ought to be the size of a hospital; in other words, how many beds it can contain with safety. But from

“ what has been said, it will be observed that this question resolves
 “ itself into the previous one, viz., what should be the size of each
 “ hospital pavilion? because, if a pavilion of healthy construction
 “ is obtained, it is evident that *the only limit to the size of the*
 “ *hospital will be an administrative one.* A hospital may be
 “ constructed for any number of sick, until a point is arrived at
 “ when some portion of the administrative arrangements, material
 “ or personal, has to be provided in duplicate. Any further
 “ extension beyond this ceases to be economical.” *

(3) *Administrative Limit.*—This quotation from Miss Nightingale puts us on the right track in considering the size and distribution of the aggregate beds required for Fever in a large city. It must be remembered that she wrote of *general* hospitals for ordinary medical and surgical cases. In respect of their mental condition and physical helplessness, Fever patients in the acute stage of their illness resemble lunatics in their dependence upon the fidelity and conscientiousness of the attendance which they require. Most of the patients in a general hospital have their perceptive faculties unimpaired, and are observant critics of all that is done to themselves or to others. Even adult Fever patients are not so. Infants again, and children of tender years, who constitute 54 per cent. of all Scarlet Fever patients, and a still larger proportion of Measles and Hooping-cough, are in all stages of their illness dependent. The convalescents, on the other hand, are during the latter part of their residence vigorous, and apt to get into mischief. In Smallpox, probably half the patients are interned not for treatment but simply for safe keeping, being persons who, after the initial sickness preceding the eruption of the few pustules which characterise their attack, are in perfect physical health, able to escape or to climb the hospital walls and otherwise hold intercourse with their friends, so that they require police supervision more than nursing. These are all circumstances which make the discipline of Fever and Smallpox hospitals break down, and efficiency of treatment and control become impossible, when numbers are aggregated, which in general hospitals working at a steady level of organisation are quite manageable. Lunatic asylums and children's hospitals always have closer supervision by a larger

* “Notes on Hospitals,” by Florence Nightingale. 3rd edition, 1863, p. 64.

staff in proportion to size than general hospitals, and Fever hospitals resemble them in this.

It must also be remembered that Miss Nightingale wrote of general hospitals on the pavilion principle, in which the wards are superimposed one upon another, while we are dealing with one-storied hospitals, in which the principle is also applied to the various administrative buildings—the residences of the officials, the kitchen and stores, the washing-house, the *morgue*, the stables, &c.,—which are all built in isolated blocks, and all are one, or at most, two-storied. Therefore, in so far as distribution over superficial area is an obstacle to efficient administration beyond a certain limit, the limit within which efficiency and economy lie will be much sooner passed in a fever hospital than in a general hospital. A hospital in which the wards are superimposed, and the administrative buildings in structural connection, is easily worked. If there is in the basement a continuous passage running below all parts of the building, with lifts here and there, rising vertically at certain points, then patients, whether alive or dead, food, fuel, *debris*, can be expeditiously distributed or collected and conveyed whenever and wherever required. All parts of the institution, and every person employed about it, are more under the eye of the responsible officials, and supervision involves little physical exertion. In a purely pavilion Fever hospital, the structural parts are scattered over acres of ground. No such facilities exist for the speedy and easy distribution of material, or proper inspection and supervision. The number of servants must be greater in proportion to the number of beds, and their service more difficult to organise and oversee. The proportionate expense must consequently be greater. This will be made apparent subsequently, in discussing some points of detail in the service and management of Belvidere. Meanwhile, I may say that, if the number of pavilions is raised to 14, by planting new pavilions on the garden plot, so as to accommodate 420 patients, then from the north end of the northern pavilions to the south end of the southern the distance is 310 yards, and, if the superintendent or matron start from their residence and make one circuit of inspection daily, over the wards and various departments, traversing each ward from end to end internally, and everywhere taking the shortest route, they will have travelled 2 miles on the flat, besides ascending and descending flights of stairs at the wards and elsewhere. No comment is

required to show the bearing of this one fact of space upon efficiency and economy of management. Nor is it necessary to do more than suggest the bearing of the same fact upon the effective distribution of heat by steam, both for heating the wards and supplying the baths with hot water. I cannot answer the question as to the part of the material arrangements, but I may ask those who can, to consider where in such a hospital, in the words of Miss Nightingale, "a point is arrived at, when some portion of the administrative arrangements, material or personal, has to be provided in duplicate; a point," any further extension beyond which "ceases to be economical"? When does the proportion of heat lost in traversing the distance from the central boilers to the extremities of such an area become such that it "ceases to be economical" to have one centre? When does the distribution in space of the points to be supervised become so great, that matrons and superintendents, and their subordinates must be "provided in duplicate," in order to secure efficiency? When those points are passed, where is the economy of concentration on one site as compared with distribution over several, especially if the advantages of distribution, which I shall shortly mention, are thrown into the scale in its favour?

Another characteristic of infectious hospitals which restricts the size, consistent with efficiency of administration within narrower limits as compared with general hospitals, is the *great fluctuations at short intervals in the number of beds occupied* in the former, while the work of the latter is steady and equable. If reference is made to the Table on p. 3, showing the "Highest and Lowest Number under treatment at one time in Belvidere, and Parliamentary Road Hospital," this peculiarity will be made apparent. If we compare the annual maximum and minimum in Belvidere, we find that the former is from two to six times the number of the latter, while, during the years when Smallpox was treated at Parliamentary Road (from 1871) the annual maximum number was from 6 to 20, and even 40 times the minimum number. This consists with the London experience, as pointed out by the Royal Commission—the Small-pox demands are of the nature of epidemic outbursts, while the Fever demands are more equable. It is with the latter we have at present to deal. Each year the requirements for fever expand and contract, so that while extreme pressure prevails at one period, at another only a half or even a sixth of the beds are occupied. This is a most important fact in

the organisation, management, and general economics of Fever hospitals. It implies a constant preparation for a rapid demand upon beds, and a consequent maintenance of the material and personal equipment, even when patients are few, against the invasion of the wards by increasing numbers. It implies, also, in spite of this preparation, a periodic engagement of new hands, a proportion of whom prove inefficient or vicious, and after injuring the reputation of the hospital are dismissed; while those who turn out well are only getting acquainted with their work when the pressure is over and retrenchment becomes the *mot d'ordre*. In this way the organisation of a Fever hospital never consolidates into that steady routine which characterises a general hospital, and which brings so much ease and satisfaction to the head officers. The matron of a Fever hospital especially is subject to a constant worry in her ward arrangements which is unknown to the matron of a general hospital. She is never done opening new wards, closing wards for one disease, preparing and opening them for another, engaging new nurses, working her old nurses at high pressure until new ones are got, and, after all, she sees every summer the whole fabric of her organisation crumbling away. The same is true of the medical superintendent. His position involves peculiar worry from the instability of the institution. The experience of general hospitals is very different. If we compare the annual maxima and minima of patients in the Royal Infirmary for the last six years, we find that the former was only from 25 to 50 per cent. higher than the latter. The wards which are open and equipped in January are so in June, with from a quarter to a half fewer patients. A surgical ward is always a surgical, and a medical always a medical. There is all the difference between the trouble and anxiety of managing a general hospital and a Fever hospital that there would be between attending and keeping at work an eight-day clock and a clock which required to be wound up every day.

From all these considerations it is obvious that the size of infectious hospitals must be kept within reasonably manageable limits, and the experience of general hospitals affords no criterion for the determination of the size proper for Fever hospitals. I believe that much of the difficulty experienced at times in getting parents to trust their children in hospital arises from temporary deterioration in the ward service in times of pressure, and that no small propor-

tion of the mischief worked by Smallpox hospitals on their environs had its origin in epidemic expansions beyond the efficient control of the chief officials. From this point of view, therefore, we are again led to the conclusion that there must be at least two Fever hospitals for Glasgow. When the total provision to be made for a community is fixed at 600 beds, we have on grounds of efficiency of administration determined the question of one or two sites. It is impossible to fix an absolute and invariable limit, and say, on one side efficiency of control is possible, on the other, impossible; but having 600 beds to provide, why not do so in two hospitals of 300 beds each? There would be no serious objection, however, to 350 and 250, or reasons might be found for 400 and 200. But the general principle is all-important. In the evidence before the Royal Commission this is dwelt upon emphatically by Dr. J. H. Bridges, Medical Adviser to the Metropolitan Asylums Board, and attached to the Local Government Board for such service. Reference may be made to his answers to queries 798, 803, 838, 839, 840. I took the liberty of putting the special case for Glasgow before him as between one hospital of 600 beds or two of 300, and am permitted to quote his reply as follows:—

“ Our London system for dealing with infectious disease has grown up in an anomalous way, as the Report of the Commission will have shown you.

“ These anomalies have had, perhaps, a certain experimental value, as throwing light on the question—What is the best plan for the future?

“ If I am asked—Is there any danger in aggregating so large a number as 600 infectious patients on one site, on the understanding that the site was thirty or forty acres, and that the pavilions were entirely dissociated, my opinion would be entirely in the negative in so far as related to the concentration of contagion. No evidence that I have seen appears to me to justify the conclusion that 200 patients nearly distributed over ten acres are more dangerous to themselves or others than 20 patients on one acre.

“ But my objection to the infectious hospital for 600 would, nevertheless, be extremely strong. It would rest entirely on the extreme difficulty of exercising the right degree of supervision and control over (1) the convalescents and (2) the subordinate officers whom such an institution must necessarily contain. Whatever may be said of hospitals in general, the government of an infectious hospital, like that of a lunatic asylum, should, I consider, be a rigid monocracy. And to

“overstrain the medical dictator by giving him more supervising work than he can possibly perform, is to ensure the breakdown, sooner or later, of the whole system.

“In the epidemic of Smallpox of 1871-2 we had 600 patients on one site. I do not enter into the disputed question as to the difference of infective radiation between Smallpox and Typhus, or Scarlet Fever. Quite apart from that, the difficulties arising from the administration of an enormous staff, and from the control of convalescents, were such as to bring about very serious scandal. Much of this might, perhaps, have been prevented by greater wisdom in the superintendent, and much was due to the extreme suddenness with which that epidemic burst upon us, so that many of the arrangements had to be extemporised in the middle of the emergency. But I am persuaded that any repetition of so large an aggregation would be a mistake, however well and wisely precautions might be taken.

“A hospital of 600 patients would have, probably, a staff of officers and servants, which, when all was told, would not be far short of 150. The regulation of the outgoings and incomings of all these people involves necessarily enormous difficulty and danger. Similarly, the control of 200 convalescents, whether children or adults, is a responsibility of serious weight.

“As to economy, I am convinced from my experience of public institutions generally (and my experience of these is considerable, as I inspect infirmaries, asylums, and schools, containing some 24,000 inmates), that when you pass a certain limit of magnitude, economy is no longer subserved. This limit differs for different kinds of institutions; but, in speaking of Fever hospitals, I may say that I think 300 the extreme limit at which economy can be made to consist with adequate control and supervision, and I should prefer to see a rather smaller number. And in saying this, I have in my mind no less the difficulty of conveyance of food and of heated water, than the difficulty of supervising a very large area by the machinery of assistant officers.” (Letter, dated 4th Nov., 1882.)

In inquiring after some general principle to guide us in the utilisation of Belvidere, I have set out from the fact that we already possess that large and eligible site, and have thus perforce begun at the wrong end of the question. I have shown that this estate was not acquired with the intention of making it the sole site. Very probably, though I can discover no clear evidence of the fact, there was some idea of feuing some portion for building purposes; but, if so, we have, by the position in which we have planted our hospitals and general washing-house, made such a

procedure quite impossible. We must, therefore, in considering the advantages of having more than one site for Glasgow, place ourselves at the right end of the question, which was that at which the advisers of the Board stood before Belvidere was purchased. Supposing we had no Fever hospitals, and were asked to advise upon a scheme suited for this population of over half-a-million living upon an area of nine square miles, what are the main conditions we should seek to compass in selecting a site or sites?

(4) The chief condition would undoubtedly be *proximity to the population for whose use the hospitals were intended*. There are two considerations which make this important:—(1) *The safety of the patient*.—On this point something has been learned by the extension of hospital treatment to other diseases than Smallpox and Typhus Fever, on experience of which the opinions previously held as to the transference of patients to a distance were based. Notably Dr. Murchison's opinions and my own were derived from observations of Typhus, which certainly bears removal without special risks from reasonable distances, provided a proper ambulance is employed. But the conclusion of the recent Royal Commission as to other Fevers is very different. They say—
 “The witnesses who have been concerned during the last few
 “years with the treatment of Smallpox on a large scale concur
 “on the whole in the opinion that, while in some cases the
 “movement of the patient is impossible, and in others only safe
 “for very short distances, yet that with such precautions as those
 “adopted by the Asylums Board this movement is practicable in
 “a greater number of cases and over a greater distance than has
 “been usually taken for granted. But this experience does not
 “apply to Fever, whether Scarlet or Typhoid. In these diseases
 “there is a considerable period during which long removals must
 “not be risked, even in cases that are not very severe. And
 “hence the country hospitals will not, as in the case of Smallpox,
 “be available for mild cases, but only for the convalescents, and
 “therefore for a far smaller proportion of the whole. It is
 “therefore extremely fortunate that all evidence goes to show
 “that well-conducted Fever hospitals involve no appreciable risk
 “to the neighbourhood.” (2) *The natural sentiments of the patients and their relatives and friends* also require that proximity

should be considered. My experience entirely coincides with the conclusion arrived at by Dr. Thorne, that "By far the greatest difficulty in the matter of distance has been found, as a rule, to be with the relatives and friends of the patients, who assent much more readily to removal to hospital if it be within such a distance as to enable them, without much trouble and without material interference with their business and other vocations, to make frequent inquiries as to the patients' welfare." Distance is not merely a sentimental difficulty, especially to the working classes. To the bread-winners it means loss of time, which is money; to the mothers, it means desertion of their children, and interference with the preparation of meals and other domestic work. Proximity of the hospital, therefore, promotes the voluntary and cheerful acceptance of its advantages, especially in the case of children. In a large and closely-built city, in the practical endeavour to give effect to these considerations and to secure proximity, it is obvious that all that can be done is to minimise distance as far as circumstances will permit. Other things must control our choice of sites, and in view of all the conditions imposed the best possible selection must be made. Glasgow measures from east to west 5 miles, and from north to south fully 3; therefore one site will not suffice. Two is the smallest reasonable concession to the requirements of proximity.

(5) *Convenience of having more than one hospital for concurrent epidemics.*—If we refer to Buchan and Mitchell's paper* on the mortality from different diseases at different periods of the year, based upon the statistics of London for thirty years, we shall see in what months the various infectious diseases most prevail, as shown by the rising of their mortality above the average for the year. Smallpox, Typhus, Enteric Fever, and Scarlet Fever are the four to which hospital treatment is most applicable. The following Table gives the months when each of these diseases is fatal above the average:—

Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
S'pox.	S'pox.	S'pox.	S'pox.	<u>S'pox.</u>	S'pox.	...	...	...	...	...	...
...	...	...	...	...	...	...	...	Sct.	<u>Sct.</u>	Sct.	Sct.
<u>Ts.</u>	Ts.	Ts.	Ts.	Ts.	...	...	...	...	...	...	...
...	...	...	...	...	...	...	E.	E.	E.	<u>E.</u>	E.

* See "Journal of the Scottish Meteorological Society," vol. iv. pp. 187-265.

July is the only month when none of these diseases are fatal above the average; and, on referring to the months when the patients in our hospitals were at their lowest ebb, we find that it was most frequently in July. If we take the six months, October, November, December, January, February, March, we find that these embrace about all the maxima of patients. In short, the greater part of the hospital work is compressed into those six months; while the remaining six months are comparatively light in their demands. The months of absolute maximum prevalence are marked by underlining. Smallpox and Typhus are diseases especially of the opening months of the year, while Enteric and Scarlet Fever coincide in a tendency to autumnal and early winter prevalence. This has been our experience. All our emergencies in hospital accommodation have arisen from the concurrence of epidemics of Smallpox and Typhus, or of Scarlet Fever and Enteric Fever. In 1871 we had a triple concurrence through the addition of Relapsing Fever to the former. In the autumn of 1880 we had the two latter combining to produce the maximum of 520 patients, with results which have already been fully described. From the much longer average residence of Scarlet and Enteric Fever patients, this means that we must be prepared in the winter months to treat three concurrent epidemics through these overlapping the Typhus prevalence of the opening months of the year. Our experience has shown that Scarlet Fever must not only have separate wards, but that these must be allotted to one section of the hospital, with a separate exercising ground railed off from the hospital area. The pavilion system is well adapted for this isolation of one section of the pavilions from another. In ordinary years this can readily be done in a large pavilion hospital, but in the event of a great epidemic of Scarlet Fever such as that of 1874, the advantage of having a distinct hospital for Scarlet Fever in a large city would be great. It would leave the other hospital wholly for Enteric Fever and Typhus, with ward space for Hooping-cough, Measles, and the other infectious ailments which are minor as regards hospital requirements, although they confiscate beds in excess of their actual numbers by the necessities of mutual isolation. Even more important would be the facility in the treatment of epidemic Smallpox, which cannot with safety be aggregated, arising from the resources of two Fever hospitals. As I have already said, our

present Smallpox Hospital is above the maximum size consistent with safety. Yet the special feature of Smallpox is its tendency to sudden epidemic outbursts. In March, 1874, we had 258 Smallpox patients in Parliamentary Road, while in the preceding September we had only 13! This was a number which, compared with the experience of other Scotch towns, not to speak of London and other English towns, was but small. Yet supposing such an outbreak to occur again, we could not deal with it in our present hospital, nor could we add to our accommodation there. In fact, unless we provide ourselves with *another hospital* we shall be utterly unable to cope with future epidemics of Smallpox. With another hospital we could not only do so, but, in the absence of Smallpox, we should have those facilities of dealing with concurrent Fever epidemics which I have described.

In the foregoing pages I have, at what must I fear be thought rather tedious length, applied to our own case all the general considerations which are involved in the important subject of this Report—the extent and distribution of the hospital accommodation for infectious disease necessary for a large city. I shall now prepare the way for the practical application to Glasgow, in the way of definite proposals arising from those preliminary discussions, by quoting at length the “practical recommendations” of the Royal Commission which has recently followed the same line of inquiry with reference to the necessities of London. There only can we look for information. The authorities of no large city have actually grappled with the management of infectious disease as the authorities of Glasgow have done. The scheme evolved in the following quotation is only in the stage of recommendation. From it we see that Glasgow has actually already worked out for herself the chief features of this scheme. The details as regards hospitals are the only part which we require to study for our information and guidance. Nevertheless, I quote the whole passage, as it may help to confirm us in the wisdom of our past policy, as well as afford the Board of Police some legitimate gratification. The whole Report of this Commission is a singularly clear and cogent example of the evolution from experience of a complete system of organisation for the largest urban population in the country, which has hitherto floundered amidst disconcerting subdivisions of interest and municipal government in sanitary matters.

“ We are of opinion that the provision of hospital accommodation
 “ for persons suffering from infectious disease in the Metropolitan
 “ districts should be entirely disconnected from the administration
 “ of the poor-law, and treated as part of the sanitary arrangements
 “ of the Metropolis.

“ We think that the conduct of the hospitals cannot be better
 “ placed than under the management of the Metropolitan Asylums
 “ Board, with such changes in their mode of election as shall give
 “ the sanitary authorities of London—that is to say, the vestries,
 “ district boards, and commissioners of sewers—at least an equal
 “ influence with the guardians of the poor in the choice of the
 “ elective members of the board.

“ We think that every person suffering from an infectious disease,
 “ or those in charge of him, or, if these neglect their duty, the
 “ occupier of the house in which the sick person is residing, or if
 “ he is a pauper, his medical attendant, should be required by law
 “ to notify the nature of the disease to the Medical Officer of
 “ Health so soon as they or any of them are aware of it, and that,
 “ in the case of non-paupers, the medical attendant should, if it is
 “ inexpedient to impose any further obligations on him, be similarly
 “ required by law to furnish the sick person, or those in charge of
 “ him, with a certificate of the nature of the disease, in the form
 “ which we have already suggested, to be by them communicated
 “ to the Medical Officer of Health. On every certificate so com-
 “ municated a small fee should be paid to the medical man who
 “ signed it.

“ If the Medical Officer, after receiving such a certificate, is
 “ satisfied that the patient can and will be properly isolated, and
 “ requisite means of disinfection adopted, the matter will proceed
 “ no further.

“ If he is not so satisfied, and if the sick person is not too ill to
 “ be removed, he will notify the case to the Metropolitan Asylums
 “ Board, who will thereupon be at once and entirely charged with
 “ the patient till his complete recovery, and, in particular, will be
 “ empowered to remove him at once to one of their hospitals. So
 “ far no distinction should be made between paupers and non-
 “ paupers who cannot be isolated. But within the hospital those
 “ who are desirous of being placed in separate wards should be
 “ allowed such accommodation on paying for it. In case of
 “ ordinary accommodation, it appears to us a question whether
 “ payment should be claimed even from those who can make pay-
 “ ment without difficulty.

“ If the sick person cannot be removed or isolated by those
 “ about him, the Medical Officer will be bound to take all necessary
 “ steps for his isolation, and generally for the protection of the
 “ neighbourhood, with power to clear the house of its inmates. In

“all-cases he will be bound to disinfect the house, and in the case
 “of houses invaded by Smallpox, should be empowered to require
 “the revaccination of all occupants who are not otherwise
 “protected.

“We are led by the concurrent evidence of several experienced
 “witnesses to hope that the immediate and complete isolation
 “which ought to be secured by these means will greatly diminish
 “the amount of Smallpox, Searlet Fever, and Typhus in London.
 “With regard to these, and also to Typhoid, still further diminu-
 “tion may be anticipated, if the attention of the proper authorities
 “is directed to the removal of all local causes of disease, and to
 “the constant employment of means of disinfection. And we
 “feel bound to repeat our conviction that Smallpox would be
 “still further reduced if vaccination could be made more effectual
 “and revaccination more frequent. But in what follows we
 “take little or no account of these reductions. How far our
 “recommendations will, from this cause, be in excess of what is
 “eventually found necessary is a mere matter of conjecture.
 “We hope they may prove considerably so. Meantime, this
 “uncertainty is a reason for proceeding somewhat tentatively.

“Subject, therefore, to what may be expected from the above
 “or other preventive measures, we think it would be advisable
 “that there should be sites and buildings which could without
 “difficulty be made capable of receiving 3,000 fever patients, and
 “2,100—or by special exertion 2,700—Smallpox patients.

“Of the 3,000 Fever cases, those in the earlier stage—
 “probably about half—should be provided for in the near neigh-
 “bourhood of London; the other half—the convalescents—in
 “two or three country hospitals.

“The existing hospitals of the Metropolitan Asylums Board,
 “which, in our judgment, can no longer be used to anything like
 “their present extent for cases of Smallpox, should, we think,
 “become in the main Fever hospitals. And we think it probable
 “that with the aid of another hospital, which appears to be
 “almost indispensable for the east of London, they would fully
 “accommodate all the cases requiring London treatment.

“By these arrangements cases of Fever would be adequately
 “provided for.

“Of the 2,100 Smallpox cases the mild, and with them the
 “convalescent cases, being probably more than three-quarters of
 “the whole, should be provided for in two or three more country
 “hospitals.

“The remainder, being the severe cases during their acute
 “stage, must be provided for in or within easy reach of London.

“For these 400 or 500 persons who, being too ill to take a

" long land journey to the country hospitals, but at the same time
 " not too ill to be removed from their immediate neighbourhood,
 " cannot or will not be properly isolated by those in charge of
 " them, we think, in the first place, that administrative blocks,
 " with a few small wards attached to them, might be maintained
 " within the precincts of the Fever hospitals, sufficient, in each
 " hospital, for 30 or 40 Smallpox patients; that the hospital
 " authorities should divide the Metropolis into hospital districts
 " assigning one to each hospital; and that no hospital should
 " receive Smallpox patients except from the district in which it
 " is situated.

" This qualification is required not only because the patients
 " will always be such as must be sent to the nearest hospital, but
 " also to obviate, as far as the nature of the case admits of it, the
 " great and natural complaint of those who are in the neighbour-
 " hood of large Small-pox hospitals that the infection of the rest
 " of London is poured in upon them.

" It is evidently of paramount importance that the areas of
 " the Smallpox wards as well as their administration should be
 " rigorously separated from those of the Fever hospitals, and
 " further, that their construction should be such as to reduce
 " within the smallest limits the chance of spreading infection.
 " We fully believe that contrivances for this purpose might be
 " devised, and we again call special attention to the evidence on
 " this head which has been furnished to us by Dr. Burdon
 " Sanderson.

" This will provide for those cases which cannot be sent down
 " the Thames. But we concur with Sir W. Jenner and Sir E.
 " Currie in thinking that others—and in years of severe epidemic
 " a larger number—might be sent down the river to hospitals in
 " isolated situations on its banks, or, if this is found impracticable,
 " to floating hospitals on the river itself. For this opinion we
 " have already given our reasons.

" It is plain that, under these circumstances, Smallpox or Fever
 " hospitals supported by parishes or unions, like those at Finchley
 " and Plaistow, will become superfluous, and they will probably
 " be disused, unless either of them should prove available as
 " hospitals of the Asylums Board. Concerning hospitals supported
 " wholly or in part by charity it was not within our duty to
 " inquire, except in so far as facts observed in them might help
 " to elucidate the questions put before us. It seems only right
 " to record that we received evidence of excellent management
 " both in the Smallpox Hospital at Highgate and in the London
 " Fever Hospital at Islington. We do not doubt that both these
 " institutions have done excellent service to the public by their
 " care of the sick, and in diminishing the risks of infection by

“taking many from houses in which they could not be duly isolated. But we think it very doubtful whether the establishment of other hospitals of the same kind, either as charitable institutions or as places of reception for those who can pay, should be allowed, unless they are to be subject to the general but effective supervision of the Sanitary Authority.

“The foregoing suggestions are calculated to meet in some degree the intermittent character of Smallpox visitations. If the hospital authorities had only to do with Smallpox, they would have to collect a staff on occasion of each epidemic, and, if they did not wish to retain it in idleness, to break it up when the epidemic was past, just as it had effectually learnt its work. The experienced officers being thus in a great measure lost, a fresh, and, from the nature of the case, a less perfect machinery would have to be created when the next emergency occurred. The comparatively permanent Fever establishments, however, will supply something in the nature of a *cadre*, which it will be comparatively easy to expand by the temporary engagement of fresh officers when the Smallpox visitation arrives, and to reduce when it is past.

“With regard to matters of detail, we have already recommended that the hospital authorities should have the entire control of the ambulances, by which all other modes of conveyance should be, as far as possible, superseded; that the regulations intended to prevent the communication of infection by visitors should be strictly enforced; that the entrance appropriated to the sick should be entirely separate from that of the tradesmen, contractors, and others; that letters should be carefully disinfected; that the nurses and attendants should not be permitted to leave the hospital except at longer intervals, and for proportionately longer periods; that great care should be taken respecting the exposure of infected clothes or bedding; and that the greatest attention should be paid to the state of the drains in and around the hospital. To all these recommendations, mainly for the protection of the neighbourhood, we attach the highest importance, and in the general interest we express a hope that means may be taken to secure that the unprecedented mass of information which has already accumulated, and is constantly increasing, in the hands of the Asylums Authorities, may be so studied and methodized as to become available for the advancement of medical science.”

It is with the hospital accommodation here recommended for a population which numbered 3,814,570 at the census of 1881 we have at present to do. It is a gigantic scheme, and as it is based upon the present provision of the Metropolitan Asylums Board,

we must first state what that is. The following Table is quoted from page 6 of the Report :—

WHEN OPENED.	No. of Patients sanctioned by Local Government Board.			ACREAGE.		
	Smallpox or Fever.	Smallpox	Fever.			
Hampstead, 25th Jan., 1870,	300	...	...	A. 8	R. 0	P. 25
Homerton, 1st Feb., 1871, -	...	102	200	8	0	0
Stockwell, 21st Jan., 1871, -	...	102	198	7	2	0
Fulham, 10th March, 1877, -	240	...	...	6	1	14
Deptford, 17th March. 1877,	310	...	...	9	2	0
	850	204	398			

This is an aggregate of 1,452 beds, distributed over 5 sites in 7 distinct hospitals, those sites representing a combined area of $39\frac{1}{2}$ acres, in the proportion of $36\frac{3}{4}$ beds to each acre. To these hospitals it is proposed to add another for the east of London, and to devote them to Fever, adding to each “administrative blocks, “ with a few small wards attached, . . . sufficient in each “ hospital for 30 or 40 Smallpox patients.” There would thus be within London 8 large Fever hospitals, and 8 small but perfectly distinct Smallpox Hospitals “within their precincts” for acute cases of Smallpox. Besides, for convalescent Fever patients draughted from those Fever hospitals, there are to be provided “two or three country hospitals,” and for “the mild, and with “them the convalescent cases” of Smallpox, “two or three more “country hospitals.” This is an aggregate of 10 or 11 Fever, and 10 or 11 Smallpox hospitals, or 20 to 22 in all. The Commissioners recommend that “the hospital authorities should “divide the Metropolis into *hospital districts*, assigning one to “each hospital, and that no hospital should receive Smallpox “patients except from the district in which it is situated.” This is recommended to avoid transport for great distances, and to obviate complaints from importing Smallpox from one locality to

another, to the danger of the latter. Eight sites would give a Fever and Smallpox hospital to every 476,820 of the population, with 4 to 6 auxiliary country hospitals for the whole. As formerly stated, the entire bed accommodation thus provided amounts to 1.33—with space for extension to 1.48—beds per 1,000 of the population.

In applying these recommendations to the case of Glasgow there is one unfortunate restriction. *We are precluded from considering a scheme for Glasgow as a community.* The Metropolitan Asylums Board, even as presently constituted, provides hospital accommodation for the entire community of London; but it does so for paupers only. The Commission proposes to dissociate the board from the poor-law organisation, and to make it a purely sanitary board, *quo ad* hospitals for infectious disease, for the entire community. The *community* of Glasgow, on the other hand, embraces what must now be a population of 700,000 (681,222 at the census of 1881); but we must confine ourselves to the wants of some 530,000. The remaining 170,000 is under numerous independent authorities, some of whom have hospitals, while others have not; but none of whom work their hospitals to the same effective purpose as Glasgow proper. To extract the maximum of usefulness from such hospitals there must be an efficient outdoor sanitary staff hunting up and urging into their wards all cases which cannot be isolated at home, and this irrespective of social distinction. This fractional treatment of the necessities of a community, in many ways unsatisfactory, is in sanitary matters especially so, and in reference to infectious disease most of all. In the event of Smallpox appearing amongst us, the suburban authorities will be in difficulties. Their hospitals are small, and could only be used for Smallpox, to the exclusion of all other infectious diseases.

In considering the distribution of our 600 Fever beds, we are no doubt hampered somewhat by the circumstance that we are already in possession of 30 acres of ground at Belvidere. Undoubtedly there is room for a large proportion of the total beds on this area, and it is desirable to turn to account as much of this area as possible. But for the fact that we own such an area—and consequently cannot get rid of this element in the comparative economy of having one hospital or two—I believe that two hospitals of 300 beds each could be managed as economically as one of 600, if fully occupied, and on the ground of efficiency and facility of classifica-

tion and proximity to the sections of the population already demonstrated, the advantages of two sites over one are unquestionable.

There are special local circumstances which limit the utilization of these 30 acres to the extent which, without a knowledge of those circumstances, one might advocate. There is first the appropriation of the north-west corner of the area for Smallpox. We have seen that a sufficient zone of isolating space must be preserved around this area. At present this space measures from the eastern Smallpox pavilion to the Fever lodge 41 yards, from the western pavilion to the west boundary of the estate 34 yards, from the southern end of the pavilions to the mansion-house, where the chief Fever officials live, 50 yards, and from the northern end to the London Road, 126 yards. It is apparent, therefore, in view of the established risk of aggregation of Smallpox, that we could not extend the Smallpox Hospital northwards. The fact that the intervening space in that direction is bounded by the public road, that therefore convalescents are separated only by a wall from the passers by, and that dwelling-houses will in course of time extend along the opposite side of this road, is sufficient, along with the circumstance that already we have 150 beds there, to preclude any extension. As to the western boundary, it would be well to acquire ground sufficient to prevent the possibility of tenements being built up to it. Probably the formation of a public street would best secure this, as well as provide a useful access to the Clyde, which at present cannot be reached but by a long *detour* by Springfield Road.

On the other hand, the presence of a Smallpox hospital, the cottages for officials next London Road already existing, and which may be built, and the adaptation of the intervening space for a Scarlet Fever airing-ground seem sufficient to make unadvisable any extension of the Fever hospital northwards. When we look southwards, the conformation of the ground is the other local circumstance which limits the possibility of extension. It is traversed by an eastern, a western, and an intermediate ravine or natural valley, so that the site is divided into two plateaus—the one on the south of the Fever hospital presently used as a garden, the other forming the lawn in front of the mansion-house. These valleys are useful as airing-grounds, though unavailable for building purposes. The lawn might be serviceable for temporary

creations in a time of epidemic pressure, but it ought to be preserved as a clear space appropriated for the recreation of the officials, and as a path for the prevailing south-west wind leading right into the centre of the hospital pavilions.

We are, therefore, limited to the southern portion of the eastern plateau in considering the capacity of Belvidere for Fever purposes. It has already been determined to erect seven new permanent pavilions on this space, which will bring up our accommodation to 330 beds. It has been suggested that three more pavilions should be placed upon the site of the garden, which would make 420 beds in all. The abolition of this garden, as being a source of unremunerative expense, has been spoken of as one advantage of this fresh extension. I cannot set myself up as an authority upon such a question in hospital economics; but I know that wherever in other institutions—for example, in connection with the City Poorhouse and Western Infirmary—a spare piece of ground can be had on which to cultivate vegetables, it has been found profitable to do so. Why ground at Belvidere cannot be profitably used for the same purpose I am unable to see. This, however, is a mere side issue. The real question is—Can a hospital of this size be efficiently managed? I fear that on the whole it is a somewhat doubtful experiment, for so it must be called, as there is at present no infectious hospital with 420 permanent beds in this country. It must also be remembered that, having the Smallpox hospital so convenient to the Fever hospital, we shall be tempted, in the absence of Smallpox, to appropriate, under pressure, as we have done for three years, 120 of its beds. It is impossible to regard 540 Fever beds under one administration with equanimity, in view of the special circumstances of difficulty peculiar to infectious hospitals. Still further, if Scarlet Fever formed a large proportion of our patients—and that is the most likely disease to assume epidemic proportions, we might have 600 to 700 patients at one time. Of course this is a temptation which might be virtuously resisted—but, as the Income-tax is a facile, though admittedly an objectionable resource for a needy Chancellor of the Exchequer, so the easy solution of temporary difficulties held out by empty pavilions is a temptation to which we would be less likely to yield if those pavilions did not exist.

III. *Suggestions as to the Structure and Administration of Belvidere Fever Hospital.*

Private Beds.—While I am opposed to the extension of our ordinary ward accommodation beyond 330 beds, I would approve of the addition of private beds, arranged in rooms for the treatment of patients of the better class who desire isolation but object to public wards. Hitherto I have always suppressed any such proposal, being in favour of ignoring social grades in rate-supported hospitals. But I confess that this was a mistake. Such a theory is, indeed, inconsistent with the principle we have adopted of dealing with infectious disease as such. While the practical aim of the adoption of this principle was to get rid of the division of interests arising from leaving paupers suffering from infectious disease to be treated by the Parochial Authorities, to whom in ordinary sickness they must have recourse, if we ignore the wealthy and independent classes when suffering from infectious disease, we create another division of interest. We exclude from the benefits of isolation many cases which it would not only be a private convenience, but a public advantage to have isolated. We are also unjust, inasmuch as we deny to a class of ratepayers participation in the benefit of the rates, by refusing to comply with the only conditions on which they can reasonably be expected to do so. We must also remember that in the Royal Infirmary, until we absorbed the functions of general hospitals in reference to infectious disease, those people had accommodation under those conditions. This desire for special accommodation is not based upon mere sentiment, though even that cannot be ignored. Parents, for example, justly hesitate to expose their children, during convalescence especially, to the miscellaneous society of other children, whose manners and language may not be to their advantage. Yet there may be circumstances in the family life of the higher ranks which render the removal of a case of infectious disease imperative. Such, for example, is the occurrence of Scarlet Fever on the eve of a confinement; the puerperal woman is so sensitive to the slightest taint of Scarlet Fever, that its presence within the four walls even of the largest house is dangerous. Governesses, pupils in boarding-schools, persons such as young men in offices, or in business, or studying at the University, and generally those living in lodgings, but of the

better class, are all illustrations of the sort of people who would be ready to retire to hospital when seized with infectious disease provided they could obtain accommodation in private apartments, or in association with persons of their own class. A charge must be made to cover the additional expenditure caused by the provision of special nurses, whose services would be absorbed by each case. There are, it must be admitted, special difficulties in the way of isolating individuals suffering from infectious disease. In America we find, in spite of Republican notions of the constitution of society tending to the abolition of class distinctions, the most extensive, complete, and intelligent illustrations of private hospital accommodation.* But it is for surgical and general medical cases, for which rooms may be readily clustered together. It would be impossible to treat cases of Typhus, Enteric Fever, and Scarlet Fever in adjacent rooms in one building at the same time, without risk of communication, or even in the same room in succession, without much trouble and danger. There are only two ways of providing rooms for this class of patients, either as adjuncts to the public wards appropriated to each disease, or in separate subdivided blocks, allotting one such block to each disease. It is impossible to adopt the former method to our existing pavilions without disfiguring their architectural conformation, and interfering with the circulation of the air unduly. The only possible way is by adopting the other alternative. There are only two diseases for which private accommodation is likely to be so much in demand as to require separate buildings—viz., Enteric Fever and Scarlet Fever. I propose, therefore, that two one-storied blocks should be erected containing 16 beds each, 8 for each sex; or it might be 20 beds, 10 for each sex—according as the Master of Works might find most suitable to his plans. One would be called the Enteric Fever, the other the Scarlet Fever block. As the patients in the latter would be children chiefly, for whom absolute privacy in each case is not required, four or six beds might be placed in one apartment, and the balance of the beds singly in rooms. For Enteric Fever, each bed must be placed singly in an apartment. In each block a common sitting-room and dining-room would be necessary, with bath-rooms and W.Cs. for each

* I have put into the hands of the Master of Works plans of some of these private hospitals.

sex, and sculleries in common. The subdivisions for the sexes, while capable of being shut off from one another, should have communication by doors, so as to give facilities for use in case of the predominance of one sex above the accommodation specially provided. Each block would require to be isolated from the other in a separate airing-ground—not surrounded by a wall, but simply marked off by a railing, with a strip of grass with shrubs and flowers.

Belvidere will always be the chief infectious hospital of Glasgow as to beauty of site and surroundings, and protection by unique local circumstances from the future invasion of its seclusion and amenities. The private hospitals placed there would be for the whole city; and we have in the southern end of the eastern plateau, at present used as the garden, an unrivalled site for the proposed blocks. Taking the walk which divides the garden from north to south as the centre of this space, we have on either hand an ample area for each block, with sufficient airing-ground for each.

As I suggest, therefore, Belvidere Fever Hospital would consist of 11 pavilions, containing 22 public wards and 330 beds; and of two private blocks containing each 16 or 20 beds—one for Enteric Fever, the other for Scarlet Fever—so that the hospital when thus completed would provide accommodation for 362 or 370 patients, with 2,000 cubic feet of space for each. There might be 400 patients, when children with Scarlet Fever formed a large proportion of the inmates, or even more according to their number.

The Wards in the general plan and internal arrangements still follow the original admirable design of Mr. Carrick in the old Parliamentary Road Hospital. I put into Mr. Whyte's hands a memorandum of several minor but important suggestions for the seven pavilions now being erected. These are being adopted, but may be mentioned here with one or two additions—(1) To omit the porches at the entrance to the acute and convalescent wards. These were intended to provide double doors—the inner with glass panels, the outer without, and self-closing, so as to prevent draughts. In usage, however, those outer doors are always open and fixed. The roof of the porch projects a flat surface into the ward, and so presents the only place where dust can lodge. This is very objectionable, and is a deviation

from a principle which, with this exception, has been rigidly followed. (2) The sinks in the nurses' sitting-rooms, off the acute wards, are not necessary, and afford a facility for disposing of slops which had better be removed. (3) All plumber work, and the wash-basins, baths, and sinks ought to be left open. The wood-work about the baths, &c., should be omitted and every pipe left visible. This is done in all recent hospitals. The plumber work will be better finished when it is known that it is to be visible. The boxing-in of the space beneath sinks, wash-basins, &c., only provides hiding places for dirt. Fillets of wood covering gas and water pipes are unnecessary, and for the same reason objectionable. In the Hôpital Tenon, in Paris, the service-cisterns for the W.Cs., are hung like clocks against the wall. In the Hertfort Hospital, Paris, I observed that every pipe at the water cisterns was distinctly labelled, so that a workman had no difficulty in tracing them so as to make out their use. (4) In the scullery, the presses, dressers, plate-racks, and all such furnishings ought to be movable. So with the linen presses, &c., in the nurses' sitting-rooms off the acute wards—the shell of these apartments ought to be perfectly finished and then all furnishings placed therein so that they can be carried out as readily as chairs or tables, preparatory to a general washing and cleaning when necessary.* (5) The wood-work about the trough W.Cs. ought to be made of hard wood, and varnished instead of painted. It ought also to be more open—*i.e.*, less of it. (6) The heating pipes in the wards ought to be further from the wall and floor so as to admit of the free use of a brush for the removal of dust. At present dust may always be found there, and it is impossible to sweep it away, at any rate, without more pains than can always be ensured. If the junction of the wall and floor were rounded in place of being at right angles, cleaning would be facilitated. (7). The excellent heating stoves used in the old pavilions ought to be utilized in the new. They supply hot fresh air, and could be connected by a pipe with the ward chimneys, standing out a little from the wall.

The painting, or otherwise rendering the surface of the main walls impermeable and smooth, ought to be considered at once, and

* I observe in the new Sick Children's Hospital that all these presses, &c., are placed on rollers, like American trunks, so that they can be readily drawn out for dusting and cleaning about them.

brought to a practical issue. There are various ways in which this may be effected so as equally well to fulfil all theoretical requirements. Experience has everywhere exploded the idea which formerly existed, that any cement surface is impervious. In the Hôpital Tenon, in Paris, the stucco is painted and varnished. Silicate enamel has been applied in some English hospitals, and in the new Glasgow Sick Children's Hospital. In the new Typhus block of Stockwell Fever Hospital there are tiles for six feet and Parian above. The Western Infirmary is an example of varnished paper which seems to suit admirably. The determination of the method is left to the committee to consider on a financial basis. It is a mistake to occupy wards before the walls have been treated after one or other of these methods, provided they can be left empty until sufficiently dry. The cement, however smooth and apparently impermeable, is porous, and receives permanent stains as well as catches dust freely. The walls are thus disfigured and contaminated. The new wards ought to be completed in this respect before being occupied. The air space provided in the main walls ensures their speedy drying.

One of the most urgent requirements of the hospital is a new suite of *Nurses' Dormitories*. The scrubbers, and other under female servants are amply provided for in the kitchen range of buildings. These sleep at night, and consequently are not inconvenienced by the noise and bustle which prevail through the day in the vicinity of the wards and kitchen. The night-nurses sleep through the day, and must, therefore, be withdrawn to a quiet region. They must also be under the eye of the matron, who ought to live with them. At present they are scattered—some in the mansion-house, some in the dormitories within the Smallpox hospital. The former ought to be reserved for the medical staff and matron. The latter are, of course, only used on sufferance, so long as Smallpox is absent. The matron being in the mansion-house, the new Fever nurses' dormitories ought to be *structurally connected therewith*. The old kitchen, stores, greenhouse, and recently-erected dormitories ought to be removed, which would admit of the erection at the east end of the mansion of commodious new dormitories. As to the extent of the accommodation, there are 22 wards, each of which ought to have two nurses and a probationer, so that 66 persons must be provided for. If we take

into account the suggested blocks for private patients, and allow a margin for emergencies, we may say that apartments for 75-80 nurses ought to be erected. Each ought to have a private room. There is a general agreement now that to secure the services of women of character their comfort must be well considered, and that a private bedroom is necessary. Among the adjuncts of this nurses' home ought to be a common sitting-room, with library, and a common dining-hall, with adequate bath-room and W.C. accommodation. The night-inspector of nurses (*a new official much required and now recommended*) should have special apartments in this building.

We thus relieve those portions of the present mansion-house presently occupied by the nurses. A very small and insufficient *dispensary* exists in the ground-floor. The question arises, where is a new and commodious dispensary—with store for drugs in bulk, linseed-meal, large jars, etc., and for wine, spirits, and ales—to be provided? The present position, close to the medical officer's apartments, was appropriate and necessary when the institution was small, and a junior medical assistant was dispenser. There must now, however, when the hospital has so grown in dimensions, always be a dispenser; and it is of importance to have this department in a more central position. If it were in or near the kitchen range, the nurses would be saved much walking and absence from their wards. When a nurse is on duty she requires to leave her ward for three purposes—(1) to get rations, fetch the patients' food and exchange her soiled ward linen, etc., for clean; (2) to get drugs and stimulants; (3) to answer inquiries of patients' friends. If the dispensary were removed to the position indicated, then for all these objects she would only require to go to points closely placed within a short distance of her ward.

The mansion-house being thus left entirely free, how is it to be utilized? It ought to be devoted to the *Matron and Medical Officers*. The superintendent has always been a bachelor, and probably may always be expected to be so. If provision had to be made for a married man, then accommodation for a distinct household would be necessary, with a separate household arrangement for the junior medicals and matron. Considering the dangers of a hospital for infectious diseases, from which even a separate house

within the hospital grounds would scarcely shield a family, the idea of providing for a married superintendent may be dismissed. For comfort and economy, therefore, the structure of the mansion-house must be such that the matron may continue to be the head of the joint household as at present, and also in close relation with the nurses. I shall state the accommodation which seems to be necessary, leaving the architect to provide and arrange it with this condition in view.

The *Medical Department* has not sufficient house-room at present. The superintendent should have a bedroom, a private parlour, and a business-room. Bedrooms for three assistants, a spare bedroom, a common dining-room, a common sitting and smoking-room, a private parlour for the chaplain, and a large board-room for meetings of the managing committee, should all be provided in the medical department.

The *Matron*, the store-keeper, and an assistant matron, with housemaid, tablemaid, cook, and any other needful domestic servants, must all be provided with adequate accommodation in the matron's department. The matron's present apartments are good; but she requires a business-room as well as a private parlour. Besides bedrooms, the two principal female subordinates require a common sitting-room and dining-room. The joint kitchen for the mansion-house should be upon the matron's flat, which would improve the salubrity of the ground flat, remove the servants entirely from that flat and place them more under the eye of the matron. If there is any difficulty in providing all this accommodation in the first floor and garrets, then the store-keeper (at present a female) and assistant matron may have apartments with the nurses. To procure all the space required for the medical department, it may be necessary to take possession of portion of the western end of the first floor as well as the whole of the ground flat. This would necessitate some internal alteration of the stair connection.

The *Washing-house* is the next department in connection with which important changes are required. The present building is halved between the hospital and the outdoor washing and disinfecting department. The latter will soon be more amply provided for in the large new building which is approaching completion in the north-east corner of Belvidere grounds. This

will remove from our midst a department which is outside the government of the hospital—which is an administrative improvement—and it will also place at our disposal much-required space, which may be utilized thus—(1) A private washing-house and laundry for the doctors', matron's, nurses', and other servants' washings. It is obviously improper to mix this up with the washing of the wards as at present; (2) a store for the patients' own clothing, where they may be duly sorted, and retained on racks after washing and disinfection until required when dismissed; (3) an ironing-room and mangle driven by steam for the hospital napery; (4) a steam disinfector, through which all infected clothing may be passed before going into the hands of the washer-women; (5) mechanical appliances for washing so as to save hand labour, and make our entire arrangements more modern than they presently are.

Workshops are necessary for an institution of such magnitude—viz., a smithy for the engineer and a shop for the joiner.

Councillor Jackson has on two occasions directed attention to the absence of any central standard indicator of time for the whole hospital. Each ward has its own cheap clock, but he recommends also a *clock and bell tower*. It is certainly desirable to have in some elevated central position a good clock, which should strike at least the hours so as to be audible throughout the hospital, and thus secure that accurate time shall everywhere be kept. A good bell, so hung as to reach the whole area over which the pavilions extend, to be rung when the food is ready for distribution from the kitchen, would be very useful. Both would require to be placed at a good elevation.

A *Water-tank* has been repeatedly urged upon the attention of the committee by Mr Gale, as a reserve in case of the water being cut off for any purpose. Without it such an occurrence means disuse of the boilers and consequent stoppage of cooking, bath-water, and heating. This, even for a day, would produce serious general inconvenience and injury to the patients.

Organisation of the service of the Hospital.—As has already been stated, the service of a purely pavilion hospital such as Belvidere, with the wards and administrative buildings scattered over several acres of ground, is a most difficult matter to carry

out efficiently, and also economically. No thorough attempt has yet been made to overcome this difficulty, and in fact it is only now possible to endeavour to do so. The hospital has hitherto been in a constant state of change, but in prospect of the buildings being completed, the method by which the service can best be arranged demands careful consideration. No system can be devised which does not involve more expenditure—first, in the form of some structural provision, and second, in the form of current outlay for hands to work it. For the sake of its hygienic advantages the pavilion arrangement is necessary and admirable, but it has inherent disadvantages in expensive working as compared with the old-fashioned plan of flats, which must be remembered in comparing the cost of maintenance of hospitals built on these different plans.

Coals and Ashes.—The present method of supplying coals and collecting ashes is both wasteful and unseemly. The coals are shot down here and there over the ground, in the place most convenient for the supply of each ward or department. Then each one takes what is desired. Naturally each appropriates at once as many lumps as can be secured, and the small coal is left to the last comer, the result being that wherever the waggons are emptied a pile of small coal and dross accumulates, and is removed from time to time to the furnaces. There can be no doubt that much saving would be effected if the coal could be distributed from one or more central points, equally dividing both small and large. The nurses, cleaners, and patients ought not to be allowed to help themselves. How is this to be accomplished? At the Deptford Smallpox pavilion hospital the coal is conveyed to the wards in bags, at the Stockwell Fever Hospital in scuttles—in both cases a light hand-carriage being employed to convey the bags or scuttles, a man being detailed for this work. In the Hôpital Tenon, Paris, a tramway traverses the basement, upon which these light carriages or trucks are pushed to the lifts. In the Western and Royal Infirmary the basement passages are used without a tramway. By whatever means the coals are distributed, the ashes and debris can be collected, the former being brought from, the latter taken to some central depot or depots. At Belvidere the present system of disposing of ashes is as unsightly as the coal distribution—ash-buckets and barrows stand openly about, and are removed and emptied at a central ashpit by a man. This service must be

organised so as to be entirely under the control of men appointed for the purpose. If cleaners, patients, or nurses are allowed to help themselves to coals, the present wastefulness will continue.

Corpses are at present conveyed upon stretching boards, wrapped up in ward sheets only. I was pleased to observe that in the Royal Infirmary black mortcloths are provided. At the Deptford Smallpox Hospital a neat bier is used, with side-flaps like the side-seats of an Irish jaunting car, with lateral hinges, so as to fold up and cover in the body. Our newest stretching-boards have a rail at each end which can be raised, and, if a black mortcloth were provided, the removal of corpses would look more decent and less ghastly.

Telephone or other electric communication between the superintendent's rooms and the various wards and departments would also tend to overcome the difficulty of communication between the various parts of the institution, and save much physical labour on the part of doctors, matron, and nurses. This arrangement would facilitate the obtaining of information, the giving of orders, and the summoning of medical or other aid in emergencies.

Internal administration.—Structure and administration must be arranged with reference to one another. The pavilion system demands more hands to work it than the flatted system. Each pavilion is, in fact, a hospital within a hospital, and the more independent each pavilion is in the completeness of its parts, and the *personnel* of its administration, the better will the idea of the pavilion be carried out. The distribution of coal, the collection of refuse, the emptying and cleansing of the trough W.Cs., all necessitate ample provision of male servants. I have alluded to the need of a new female official for the supervision of the nurses on duty at night. By day the matron and assistants, the superintendent and junior medical staff, are all afoot and moving about the wards, but at night there is no such security for the fulfilment of duty by the nurses. Yet by night is strict attention to duty most required, and the circumstances tending to carelessness are most present. Most of the complaints with which we have had to deal have originated in the night. I therefore strongly recommend the appointment of a female Inspector of Nurses for night duty. There is such an official in the Royal and Western Infirmaries. She must be a person acquainted practically with the duties of

a nurse, and thoroughly trustworthy. Her duty would be to move about from ward to ward, to be advised of cases requiring special attention, to prevent sleeping while on duty, and to summon the medical officer in charge when necessary.

House-Steward.—The appointment of a House-Steward has frequently been talked of recently, and recommended. It has been now generally recognised that the supreme command in a hospital ought to be in the hands of a qualified medical man. No layman can possess that knowledge of medical affairs, and that professional sympathy which must actuate all the arrangements of an institution, the *raison d'être* of which is to provide comfort and efficiency about the sick-bed. But there are two ways in which the duties of the medical superintendent may be arranged. Under one system, which is that followed in the general hospitals of Glasgow and the larger Scotch towns, the medical man has no medical duties to perform. He does not take medical charge of wards. His whole attention is devoted to the internal administration. He must, therefore, first of all possess good business capacity. He need not possess, and certainly does not exercise, professional skill. The reputation and good management of the institution depend solely upon his business capacity. Under the other system—which is that followed in our Hospital and in the Hospitals of the Metropolitan Asylums Board, and generally in all hospitals for infectious disease—the Medical Superintendent must first of all possess and exercise medical skill in the actual treatment of infectious disease. The credit of the hospital depends primarily upon his standing and reputation in the profession. Our patients repair to our wards under a certain amount of compulsion or, at least, necessity, arising from the fact that we have assumed the entire management of infectious disease. The duty is imposed upon us by law, and the acceptance of our services is also a matter of law. The majority of our patients would, if suffering from a non-infectious ailment, be treated at home by their own doctor. The harmony and facility of our operations depend largely upon the opinion the private practitioner has of the professional ability of our medical staff, and especially of the permanent medical head of that staff. The fact that the Medical Officer of Health is also consulting physician gives some security that special experience is at the service of the patients; but every medical man knows that the resident head, who is always upon the spot, determines the

practical skill available, not merely on emergency, but in the daily routine treatment. The business capacity is, therefore, not merely subordinated to the medical skill of the superintendent, but he ought, as far as possible, to be relieved of the business details of the hospital. We must look to London for a guide to the accomplishment of this. There the numerous epidemic hospitals managed by the Asylums Board all have medical superintendents, who have medical charge of the patients, with junior assistants, as at Belvidere ; but each has a "House-Superintendent" under him for the business management of the hospital. Even in the Royal and Western Infirmaries, where the Superintendents have no medical responsibility, they have "House-Stewards" under them ; but the office of "House-Superintendent" embraces a wider range of duty. Without entering upon the nature and extent of these duties, reference is made to the Memorandum of the Local Government Board of date, December, 1870, for a full specification. The uniform salary of this official is £150, and he must not be under 25 years of age.

Master Tradesman.—In an institution of such size as this hospital, with so many buildings and extensive working apparatus requiring careful attention to preserve in repair, some practically skilled resident person is necessary. We have an engineer and a carpenter. I cannot decide as to the competence of the present engineer, but it is to the development of this office I would look for the performance of the duties assigned in the Western Infirmary to the "Master Tradesman," which are described as follows in the Rules, and are exactly what we require to be attended to at Belvidere :—

" 1. *The Master Tradesman* shall devote his whole time to
 " the affairs of the institution, under the superintendent of the
 " Infirmary, whose instructions he is to be guided by, and take
 " the care and oversight of the whole building and premises, with
 " their fittings, inside and outside, particularly of the boilers,
 " machinery, and the firing of the boilers, the hoist, washing and
 " drying apparatus, the gas and water pipes, apparatus for
 " extinguishing fire, and drainage ; and generally to make himself
 " useful for the benefit of the institution at all times, and when
 " necessary, during night as well as during the day, to put his
 " hand to anything that requires attention or repair, and see that
 " the work for which other tradesmen are employed is efficiently
 " done.

" 2. He shall keep a book in which he will daily enter how he is employed, and whatever he finds defective in the premises, or requiring to be provided. This book to be submitted to the House Committee at their weekly meetings."

The wage of this servant in the Western Infirmary is 35s. per week, with house, coal, and gas. The house is the back lodge.

IV. *The Clinical Study and Scientific Investigation of Infectious Disease.*

It is a trite observation that every good has its associated evil; every advantage in human affairs, some attendant disadvantage. The severance of the treatment of infectious disease from the general hospitals of a community, and the acceptance in its entirety of the hospital treatment as part of the preventive management of this class of disease by the local authority is no exception to this observation. The criticism which has been brought to bear upon the whole procedure of authorities in reference to infectious disease by the medical profession, through the proposal to impose upon it the duty of compulsory notification, will be productive of good in many respects. Some of it is mistaken and erroneous, or, at least, injudicious, much more of it is indiscriminating and unfair; but some of it also is correct, and generally applicable, or applicable to certain local authorities, though inapplicable to others. As an illustration of this last set of criticisms, what could be more ridiculous than the case of an authority applying for compulsory notification within its district, when it has no means of making use of the information although it had it? What avails the knowledge of all the cases of infectious disease within its jurisdiction if the authority has not previously equipped itself with hospitals for isolation, washing and disinfecting establishments, and an ample staff to observe and regulate and enforce the law as to isolation and disinfection? Such a procedure can result only in most reasonable irritation of the profession, and seems like an attempt to divert public attention from administrative laxity and incompetence by the imposition of practically useless duties upon the community, and especially upon medical men. If compulsory notification is asked for by any authority by private bill, the proposal ought not to be entertained by Parliament until that authority has proved that it has itself

complied with the law in every particular of provision of the means for dealing with infectious disease. If, on the other hand, any national measure is passed, which is the only mode of obtaining the advantages of compulsory notification in a perfect manner, the provision of these means ought also to be made compulsory. Permissive legislation as regards the duties of authorities, and compulsory legislation as to the duties of medical men or householders are thoroughly unjust and incompatible. It is, however, equally true that to endeavour to argue against the utility of notification, from its obvious uselessness in the hands of incompetent or inactive authorities, is unfair. No discussion of the general utility of a knowledge of the existence of infectious disease is to the point, in any particular case, unless it is accompanied by a full exposition of the use which has in that case been made of the knowledge by the application of all the recognised modes of controlling or checking the disease, the existence of which is thus ascertained. Wherever practical measures follow up compulsory notification the results must be beneficial. If this is not so, then the less the authorities know the better, or at least it is a matter of sheer indifference for the prevention of these diseases whether they are met with preventive measures or not—that is to say, the whole system of preventive legislation is a mistake; which is a *reductio ad absurdum* of the argument against the utility of compulsory notification as it has recently been urged in Glasgow, Liverpool, and elsewhere.

Such a line of argument carries its own refutation with it; but this good will come of it: The day of permissive legislation as regards the duties of local authorities will come to an end with compulsory legislation as applied to the medical profession and householders, or both. I trust the criticism of the procedure of sanitary authorities and their officials will be continued by the medical profession. It is absurd to exact information of which no good use can be made owing to neglect of duty by authorities and officials. As local authorities are at present constituted and officered in Scotland, outside of the large towns, no general measure of notification can be justified. Take any rural parish, and with what grace can we expect the profession to accept of the duty of reporting their cases of infectious sickness to an authority whose staff consists of a sanitary inspector who gets £5 per annum for his work, and to a medical officer who is a *riva* in practice,

and subject to all the jealousies and petty motives of a small community. The criticism of the profession ought, therefore, to push on the sanitary reform of Scotland.

All this is somewhat outside the scope of this Report, but one criticism of the sanitary procedures against infectious disease, which has been called forth by the discussion on compulsory notification, falls naturally under our notice. It is this, and we quote the words used by a friendly critic in our own case:—
 “In the new Police Bill, special powers as to the compulsory notification of infectious diseases are asked, in accordance with which the medical practitioner will be required, under pains and penalties, to notify to the Local Authority the existence of such disease as may occur in his practice; *but, by its own act, the local authority is rendering the clinical study of and the means of diagnosing the more important of these diseases practically impossible.*”* Dr. Christie means that Glasgow is an important medical school; that whereas in the Fever wards of the Royal Infirmary students had the opportunity of studying the diagnosis and treatment of the more important infectious diseases, now that these diseases have passed into our hands, and are treated in special hospitals on the outskirts of the town, they no longer have this opportunity. From the thoroughness of our action in Glasgow this criticism applies with more force here than anywhere else. But in the Report and Evidence of the Royal Commission on the Fever and Smallpox Hospitals of London, the importance of providing for the clinical instruction of students in these hospitals, and of in general making their experience available for the advancement of medical science, is forcibly urged.† It is quite obvious that this is an aspect of the duty of sanitary authorities in reference to infectious disease which will not be lost sight of by the medical profession and by those who regulate medical education, but which will become more urgent and important in proportion as the authorities in University towns and towns where there are medical schools follow the policy laid down by law.

* Dr. Christie's paper “On the Importance of the Study of Infectious Diseases,” in *Sanitary Journal*, January, 1883.

† Report, pp. xiii. and xxxiii.

The position of the local authority is this—It is commissioned to adopt measures for the prevention of infectious disease by any method, direct or indirect. To this end nothing can contribute so much as a full and precise knowledge of the disease itself—including the character of its contagium, the mode of propagation and dissemination of this contagium, its predisposing causes; in short, the vast area of facts covered by the phrase—its natural history—as well the symptoms and pathological phenomena and conditions observed during life and after death. While these diseases were treated in general hospitals, or in special hospitals supported by charity, they were studied in all these aspects and with the best results. The distinction between Enteric Fever and Typhus was worked out in the Royal Infirmary Fever Wards. The facts for the classical work of Murchison on Continued Fever were accumulated in the wards of the London Fever Hospital. The managers of these institutions provided facilities for these studies in *post-mortem* rooms and pathological museums, and apparatus, such as microscopes, etc. They did so as part of their work in the public interest. Now that those diseases have passed into the hands of local authorities who represent the public interest more directly, it seems obvious that their duty does not merely consist in treating patients with economy and success, but in also taking means to turn their sickness to general profit by making it contribute to science and education.

The authorities of Glasgow have always given every facility for the admission of students with their teachers to their hospitals. While Superintendent in Parliamentary Road, I had occasionally a number of Professor Gairdner's students in attendance during my visits to the wards. At Belvidere, Professors Gairdner, McCall Anderson, Gemmell, and Drs. J. W. Anderson, Finlayson, and Christie have all made repeated visits. These, however, were chiefly for the purpose of demonstrating the characteristic eruptions and other diagnostic points, and could not much advance the students' knowledge of treatment. Students to the number of 40 or 50 at a time have accompanied these gentlemen. The distance of the hospital from the centre of the city, and especially from the University, is a complete barrier to visitation except upon Saturday, which is the day usually chosen. On the other hand, both professors and students have now at Belvidere what they never had before, collected like plants in a botanic garden

specimens of all kinds of infectious disease ; so that it is possible to pass from one to another and compare their eruptions and the general physical aspect of those who suffer from them. There are usually to be seen more or less of Enteric Fever, Typhus, Scarlet Fever, Measles, Hooping-cough, Erysipelas, Diphtheria, and occasionally Smallpox, Puerperal Fever, and Chicken-pox. In former days students might have seen Typhus and Enteric Fever (this latter not in anything like such numbers), but very rarely Scarlet Fever or those other diseases of children. Thus while the distance is an inconvenience, the variety and completeness of the specimens of disease open to inspection are advantages not previously enjoyed. There is little chance of Fever ever again being treated in proximity to the Medical Schools of Glasgow. The Western Infirmary, like other recent hospitals, would never have obtained its site except under condition of exclusion of infectious diseases. The Royal Infirmary requires all its space for general disease. The directors and subscribers have learned that they only relieve the assessments, at the cost of charity, by treating infectious cases. Much also has been learned as to the impossibility of accommodating various infectious diseases in flats ; and this both prevents the use of old-fashioned Fever houses and makes it impossible to find the area necessary for pavilions excepting in the suburbs. Smallpox is now known to be an ' irreconcilable,' requiring separate hospitals far removed. Free access to their wards is about all that the local authority can give to the education of students.

As to the scientific study of the natural history and pathology of infectious disease something more might be done. There is a good *post-mortem* room attached to the new dead-house at Belvidere, but a *pathological laboratory* is required, fitted up with apparatus for examination and analysis of urine and other products, supplied with microscopes and lenses of the highest power, and means for cultivating, staining, and examining infecting organisms. The assistants appointed to Belvidere generally come direct from the Western Infirmary, where they have been educated in the use of all those facilities, and are capable of applying them to the promotion of investigation. The present dead-house is so large that a new *post-mortem* room might be with little expense divided off from its north end. The present *post-mortem* room might then be made into a pathological

laboratory. It would require to be floored and made quite comfortable in all weather.

By thus affording facilities for investigation, and keeping that before us as a part of the business of the local authority and their officers, it might be expected that from Belvidere would from time to time come substantial contributions to the sum of knowledge concerning the diseases for the repression of which it exists.

CASES TREATED IN CITY OF GLASGOW

OPENED 26TH

YEAR ENDING 30TH APRIL.	TYPHUS.		ENTERIC FEVER.		RELAPSING FEVER.		SMALLPOX.		SCARLET FEVER.		MEASLES.		HOOPING- COUGH.	
	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
1865-66	1,154	128	64	8	—	—	7	—	5	—	—	—	—	—
1866-7	384	48	17	4	—	—	34	3	21	4	1	—	—	—
"	Treated in Parliamentary Road while reserved for Cholera only.													
"	Treated in Greendyke Cholera Hospital.													
1867-8	795	72	55	9	—	—	14	1	35	8	3	—	—	—
1868-9	1,023	142	91	9	—	—	2	—	34	7	4	1	—	—
1869-70	2,023	278	77	5	19	1	1	—	12	2	2	—	—	—
1870-1	495	56	38	2	1,863	31	369	46	—	—	7	—	—	—
1871-2	7	—	2	—	42	1	614	105	31	6	22	1	—	—
1872-3	—	—	1	—	—	—	578	97	—	—	10	—	—	—
1873-4	—	—	—	—	—	—	1,475	262	7	—	16	—	—	—
1874-5	—	—	—	—	—	—	191	25	442	65	48	2	—	—
1875-6	—	—	—	—	—	—	16	2	419	49	130	2	—	—
1876-7	—	—	—	—	—	—	40	7	65	5	29	1	—	—
1877-8	—	—	—	—	—	—	80	9	—	—	2	—	—	—
Closed 6th March, 1878.	5,881	724	345	37	1,924	33	3,421	557	1,071	146	274	7	—	—

CASES TREATED IN BELVIDERE

OPENED 25TH

1870-1	207	26	3	1	1,199	32	10	—	1	—	—	—	—	—
1871-2	504	55	83	13	1,702	36	—	—	12	1	6	—	—	—
1872-3	297	33	181	20	76	1	—	—	53	6	15	—	—	—
1873-4	228	33	275	26	—	—	—	—	313	36	45	1	—	—
1874-5	457	51	342	24	—	—	3	—	721	125	39	—	—	—
1875-6	530	58	527	66	—	—	—	—	22	—	3	—	—	—
1876-7	350	50	299	36	—	—	—	—	146	16	52	4	—	—
1877-8	275	37	287	44	—	—	—	—	127	21	105	10	10	2
1878-9	238	44	375	51	—	—	—	—	353	40	250	8	66	11
1879-80	239	34	407	55	—	—	—	—	536	64	115	3	98	11
1880-1	251	41	802	102	—	—	—	—	880	100	244	21	53	5
1881-2	227	33	391	57	—	—	—	—	634	54	279	14	54	5
	3,803	495	3,972	495	2,977	69	13	—	3,798	463	1,153	61	281	34

CASES TREATED IN NEW SMALL-

1878-9	—	—	—	—	—	—	13	—	—	—	—	—	—	—
1879-80	—	—	—	—	—	—	1	—	—	—	—	—	—	—
1880-1	—	—	—	—	—	—	11	3	—	—	—	—	—	—
1881-2	—	—	—	—	—	—	6	—	—	—	—	—	—	—
	—	—	—	—	—	—	31	3	—	—	—	—	—	—
TOTAL,	9,684	1,219	4,317	532	4,901	102	3,465	560	4,869	609	1,427	68	281	34

FEVER HOSPITAL, KENNEDY STREET.

APRIL, 1865.

FEBRICULA.		DIPHTHERIA.		ERYSIPELAS.		CHOLERA.		DIARRHOEA.		CHICKEN-POX.		OTHER DISEASES.		TOTAL.	
T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
24	—	—	—	—	—	—	—	—	—	—	—	64	6	1,318	142
13	—	—	—	—	—	—	—	—	—	—	—	37	6	507	65
.	.	.	.	.	.	12	9	18	4	.	.	10	—	40	13
.	.	.	.	.	.	7	4	6	—	.	.	—	—	13	4
22	1	—	—	—	—	—	—	—	—	—	—	45	9	969	100
24	—	—	—	—	—	—	—	—	—	—	—	62	12	1,240	171
19	—	—	—	—	—	—	—	—	—	—	—	77	15	2,230	301
17	—	—	—	—	—	—	—	—	—	—	—	87	39	2,876	174
—	—	—	—	—	—	—	—	—	—	—	—	24	2	742	115
1	—	—	—	1	—	—	—	—	—	—	—	24	—	615	97
—	—	—	—	—	—	—	—	—	—	1	—	70	—	1,569	262
—	—	—	—	—	—	—	—	—	—	4	—	63	2	748	94
—	—	—	—	—	—	—	—	—	—	2	—	67	—	634	53
—	—	—	—	—	—	—	—	—	—	2	—	19	—	155	13
—	—	—	—	—	—	—	—	—	—	9	—	8	1	99	10
120	1	—	—	1	—	19	13	24	4	18	—	657	92	13,755	1,614

FEVER HOSPITAL, LONDON ROAD.

DECEMBER, 1870.

6	—	3	2	—	—	—	—	—	—	—	—	20	10	1,449	71
54	—	—	—	1	—	—	—	—	—	—	—	188	42	2,550	147
45	—	—	—	—	—	—	—	—	—	—	—	65	21	732	81
40	—	—	—	3	—	—	—	—	—	—	—	103	24	1,007	120
25	—	—	—	2	—	—	—	—	—	—	—	221	40	1,810	240
31	—	—	—	2	—	—	—	—	—	—	—	88	18	1,203	142
53	1	2	—	5	—	—	—	—	—	—	—	123	11	1,030	118
30	—	2	2	3	1	—	—	—	—	—	—	125	23	964	140
35	—	3	2	6	2	—	—	—	—	—	—	184	23	1,510	181
37	—	2	—	10	1	—	—	—	—	—	—	152	20	1,596	188
58	—	7	—	15	2	—	—	—	—	—	—	267	23	2,577	294
64	3	11	7	18	—	—	—	—	—	—	—	254	34	1,932	207
478	4	30	13	65	6	—	—	—	—	—	—	1,790	289	18,360	1,929

POX HOSPITAL, BELVIDERE.

—	—	—	—	—	—	—	—	—	—	3	—	4	—	20	—
—	—	—	—	—	—	—	—	—	—	9	—	1	—	11	—
—	—	—	—	—	—	—	—	—	—	11	—	6	—	28	3
—	—	—	—	—	—	—	—	—	—	8	—	4	—	18	—
—	—	—	—	—	—	—	—	—	—	31	—	15	—	77	3
598	5	30	13	66	6	19	13	24	4	49	—	2,462	381	32,192	3,546

TABLE SHOWING PERCENTAGE OF CERTAIN DISEASES TO THE TOTAL NUMBER TREATED YEARLY (EXCLUDING SMALLPOX).

[illegible]

MEMORANDUM BY THE MASTER OF WORKS ON
THE HOSPITAL ACCOMMODATION REFERRED
TO IN DR. RUSSELL'S REPORT, OF DATE
DECEMBER, 1882.

(WITH SKETCH PLAN).

As desired by the Health Committee, I have considered the various points referred to in Dr. Russell's Memorandum, so far as these relate to the application of the lands of Belvidere for future hospital accommodation, and as to the best means of extending and completing the same on the lines suggested by the Medical Officer.

With reference to the extent to which the lands of Belvidere may be utilised for extended hospital accommodation, I have no hesitation in confirming Dr. Russell's recommendation, that no further development of the hospital should be contemplated on the area lying between London Road and the present Fever wards. In view of the extension of the city in this direction at no distant date, it appears to me absolutely necessary that the hospital should, as far as possible, be isolated from surrounding property. The existence of the hospital will not prevent the erection of dwelling houses and other buildings on the adjacent lands, and the proprietors and occupiers would in all likelihood raise a clamour for its removal. The Committee should, in anticipation of this contingency, leave such a space on the south side of London Road unbuilt on as will remove all cause of complaint. Dr. Russell's recommendation as to the purchase of additional ground along the western boundary, in my opinion, deserves the serious consideration of the Committee.

With reference to the several arrangements necessary to give effect to Dr. Russell's views, an examination of the block plan now submitted will show the mode in which they may be carried out.

On the site of the garden it is proposed to erect two separate buildings for the accommodation of private beds. These will occupy space which was formerly regarded as available for ordinary hospital extension. The adoption of the system of private beds for paying patients, will thus to some degree limit the capacity of the hospital for the ordinary patients who are admitted without charge.

The question of nurses' dormitories is one which involves not merely considerable expenditure, but the erection of structures of such extent as will necessitate changes in existing buildings. The removal of the old kitchen, &c., pointed out by Dr. Russell, will not be sufficient, and I am of opinion that the stable will also require to be taken away and a new site substituted. The plan shows a new position, so arranged that access to the stable may be obtained directly from London Road. The proposed houses for the tradesmen connected with the hospital will also front this thoroughfare. This will prove beneficial to the hospital in freeing it from all traffic between the stables and dwelling-houses.

It is proposed to erect a dispensary to the east of the buildings occupied as kitchen, &c. This situation is central, and regarded as convenient for the proper administration of the department.

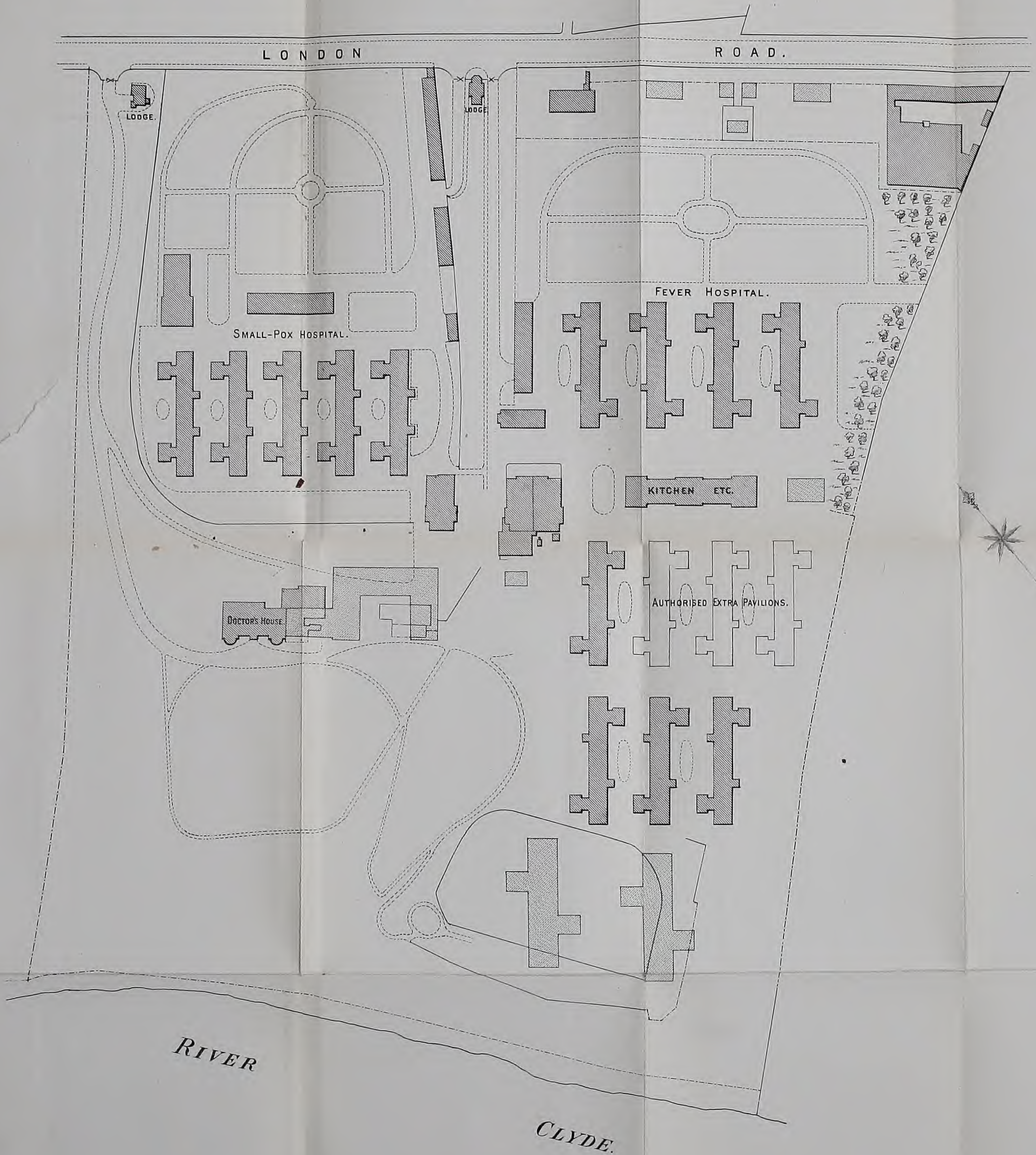
In carrying out the general plan thus indicated, the various minor alterations and amendments may be adopted, such as the erection of smiths' and joiners' workshops, and the alteration of the mansion house, as suggested by Dr. Russell, for the proper accommodation of the medical staff.

JOHN CARRICK.

19th February, 1883.

CITY OF GLASGOW HOSPITALS, BELVIDERE.

BLOCK PLAN.



The Buildings intended for Private Beds, Nurses Dormitories, and other purposes referred to in the Report are shewn thus



