

**12,500-WORD OBSERVATIONS ON ISOLATION
IN THE 1896 ROYAL COMMISSION'S REPORT ON VACCINATION**

[Source](#)

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(D.) As to what means, other than vaccination, can be used for diminishing the prevalence of small pox; and how far such means could be relied on in place of vaccination.

451. Another question upon which we are asked to report is, what means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.

452. The means other than the inoculation of small-pox or cow-pox, which have been referred to by witnesses as being capable of diminishing the prevalence of small-pox, are such means as have been employed against infectious diseases generally; they may be summarised as – 1. Measures directed against infection, e.g., prompt notification, isolation of the infected, disinfection, &c. 2. Measures calculated to promote the public health, the prevention of overcrowding in dwellings or on areas, cleanliness, the removal of definite insanitary conditions, &c.

The principle underlying the practice of isolation with its accompanying machinery is obviously the very opposite of that which recommended the practice of inoculation; it aims at exclusion of the disease, whereas inoculation aimed at universal acceptance by artificially “sowing” or “buying” the disease. Except in regard to the plague our knowledge and practice of measures of isolation and quarantine against epidemics is of relatively recent growth. As the result of increased knowledge of the mode of propagation of infectious diseases, of greater sanitary activity, and under the stimulus of legislation, organised effort, more or less thorough, is now, in this as in other countries, directed against the spread of dangerous infectious diseases. Side by side with a vaccination, system, means of isolation, &c., have been successfully employed to check the spread of small-pox. They have also been sometimes so employed in recent years in places where vaccination has fallen into disuse.

453. It will be well to commence with a brief statement of the growth of our knowledge on the subject of isolation as a means of dealing with infectious or contagious diseases. We have already adverted to the fact that small-pox is highly contagious, and that contagion from those suffering from it is the means by which the disease is propagated.

454. Although reference to infection appears in some of the Arabian writers, the contagiousness of small-pox attracted little attention in this country and in Western Europe until the 18th century. Sydenham (1624-1689) though he refers to the contagiousness of small-pox, did not dwell upon the matter and did not regard it as so important an element in the spread of the disease as some peculiar constitution of the atmosphere to which he attributed epidemics. Boerhaave was the first at the commencement of the 18th century distinctly to formulate the now generally accepted doctrine that small-pox arises only from contagion.

455. In 1720, Mead drew up an elaborate system of notification, isolation, disinfection, &c. in view of a threatened invasion of the plague, but no attempt to deal with small-pox in a similar fashion appears to have been made until the last quarter of the 18th century. This was in all probability largely due to the adoption of inoculation as the recognised defence against small-

pox, and the acceptance of Sydenham's doctrine of epidemic causation may have exercised an influence in the same direction.

456. No writer appears to have suggested methods of isolation, disinfection, &c. against small-pox prior to 1703. In that year **Rast of Lyons** published his *Reflections on Inoculation and Small-pox*, and upon the means which might be taken to deliver Europe from that malady. He maintained – 1. That small-pox was not a necessary and inevitable malady. 2. That it arose only from contagion. 3. That it resembled plague in most of its features. His conclusion was expressed in these terms:

I say, that to deliver Europe from small-pox we must act upon **principles directly opposed to inoculation**; far from multiplying the contagion we must keep it away by taking the same precautions and employing the same measures against that malady as have proved so successful against leprosy and the plague.

[**Sanjeev: obviously, his belief that isolation/quarantine had anything do with reduction in plague is pure nonsense, but even bad thinkers can think sensibly once in a while**]

The earliest account of the practical employment of such means is from **Rhode Island**, U.S.A. Haygarth, on the authority of Drs. Moffat and Waterhouse, states that for many years prior to 1778 small-pox had been successfully prevented from becoming epidemic there by regulations for isolation of the infected on a neighbouring small island specially used for that purpose, and for quarantining infected vessels, destruction of infected clothing, &c. Moreover, **inoculation was discouraged at Rhode Island**, and those who wished to be inoculated had to go to some place away from the Island, and were not to return until there was no danger of their infecting others.

457. A passage in Dimsdale's work on Inoculation, published in 1781, shows that in some towns of England pest-houses were beginning to be used for small-pox. In 1784 **Haygarth**, of Chester, published his "Inquiry how to prevent the Small-pox," and in 1793 "A Sketch of a Plan to Exterminate the Small-pox from Great Britain." The great epidemic of small-pox at Chester in 1774, to which allusion has already been made, was the occasion of Haygarth's first attempts at organised dealing with epidemics of small-pox with a view to prevention. In his Inquiry he combated Sydenham's doctrine that epidemics are due to some occult condition of the atmosphere, and argued that small-pox was always spread by infection only. He further maintained that the variolous poison could be carried as an infection for a little distance only through the air, and "consequently that the small-pox may be prevented by keeping persons liable to the distemper from approaching within the infectious distance of the variolous poison till it can be destroyed." These views led him, upon the return of an epidemic in 1777, to propose a plan for the prevention of the natural small-pox, and in 1778 a society was formed to carry out the plan in Chester.

The plan consisted on the one hand of a general inoculation at people's homes at stated intervals, on the ground that the inoculated small-pox was far less fatal or injurious than the natural small-pox, and on the other band of "Rules of Prevention" based on Haygarth's views of infection. In the report of the society, called shortly "The Small-pox Society," dated September 1782, it is stated that **in the 4 ½ years of its existence two general inoculations had been held, and that the deaths from small-pox had been greatly lessened**. Great difficulties, however, were met with. "A large proportion of the inhabitants" refused inoculation, and a large proportion also being fearless, or rather desirous, that their children should be infected with the natural small-pox," refused to obey the Rules of Prevention.

Hence, though the same report states that the example of Chester had been followed by Liverpool, where “a general inoculation was successfully executed in the autumn of 1781 and another in the spring of 1782,” and in Leeds, where a general inoculation was held in 1781, and another proposed in 1782, with such success that the Royal College of Physicians in Edinburgh appointed a committee to inquire into “the modes of conducting the general inoculations of the poor” thus adopted in these places, the plan met with such difficulties that it was ultimately abandoned. It will be observed that a general inoculation was an essential part of the plan proposed and carried out in 1778-82; but, **writing in 1784, Haygarth looked forward to being able ultimately to dispense with inoculation**, and **in the preface to his later edition, published in 1793, he states more definitely that the adoption of his Rules of Prevention without any general inoculation might exterminate small-pox in some country other than Great Britain**. It must be remembered, however, that Haygarth entertained the opinion that **the infection of small-pox could not be carried through the air above about half a yard, and that no one could be infected by the clothes of a person visiting a small-pox patient provided that he kept beyond this distance from the patient**. It is obvious that if this had been established the control of the disease by isolation would be a much simpler matter than it really is. [[Sanjeev: THIS HAS BEEN CONCLUSIVELY ESTABLISHED](#)]

458. In the Medico-Chirurgical Review for 1796 there appeared an account of a work by **Dr. Faust of Leipsic**, entitled “An essay on the duty of man to separate persons infected with the small-pox from those in health, thereby to effect the extirpation of that disease equally from the towns and countries of Europe,” in which it was argued that **the first person ill in a place is the only source from which all the rest**, perhaps hundreds and thousands, become affected, and that if he were put immediately into a situation where he could not injure by contact those who had not had the disorder, the spread of the disease would be prevented.

In the same Review for 1799 appeared an account of establishments for the extirpation of small-pox. The failure of inoculation to attain the desired end is referred to, and **legislation is urged to facilitate isolation**. It is further stated that in 1796 the Prussian College of Physicians reported favourably to the King on the project, and that at Halberstadt it had been resolved to **establish a house for the purpose**. At Cote d'Or in France a similar plan had been tried with success.

459. In 1798 Jenner's Inquiry was published, and in the early years of this century inoculation began to be discouraged; for a while the prospects of annihilating smallpox by vaccination appear to have superseded, in the minds of many, the plans of Haygarth and others. Some vaccinators, however, like **Willan and Ring**, still looked to methods of quarantine and to national and municipal regulations promoting isolation to exterminate the small-pox.

It is worthy of notice, too, that Haygarth himself, in a letter quoted by Dr. Cappe of York in a communication to the London Medical and Physical Journal (Vol. IV., p. 429), dated October 13th, 1800, remarked, “an introduction of the vaccine still more than of the variolous inoculation would effectually promote the great object of my publications.” [[Sanjeev: here he's merely saying that vaccine is better than inoculation, which is a no-brainer](#)]

460. Prior to the year 1866 there was no provision made by law for enabling sanitary authorities to establish hospitals for infectious diseases and thus to promote the isolation of such cases. The only institutions of that description then existing were the result of private effort. So far as regards small-pox there was, practically speaking, no provision for its treatment by means of isolation.

461. The Sanitary Act of 1866 empowered, though it did not compel, local authorities throughout England and Wales, Scotland, and Ireland, to provide or to join in providing isolation hospitals for the use of the inhabitants of their districts. There was further legislation on the subject by the Public Health Act, 1875; the Public Health (London) Act, 1891; the Public Health (Scotland) Act, 1867; and the Public Health (Ireland) Act, 1878, into the details of which it is not necessary to enter. The most recent Act relating to the matter is the Isolation Hospitals Act of 1893, which applies to the small towns and rural districts of England and Wales.

462. In London the local authorities to whom the power to provide isolation hospitals was given by the Sanitary Act of 1866 were in the City the Commissioners of Sewers and in other metropolitan districts the Vestries or District Boards. With few exceptions . these authorities did not exercise the powers conferred on them, and, speaking generally, it may be said that the Sanitary Act of 1866 had practically no effect in London as regards the provision of hospital accommodation for small-pox. Some few of the metropolitan workhouses, however, had infectious wards attached in which cases of small-pox were treated, and the guardians of some of the unions sent cases by arrangement to the small-pox hospital at Highgate. This institution, which had been established in 1746, was extended in 1850 so as to provide accommodation for about 100 small-pox patients. It remained down to the year 1870 the only small-pox hospital in London.

463. The obvious difficulty and danger attending the treatment of persons suffering from small-pox in the same institutions in which other destitute persons are practically forced to reside led to the enactment of certain provisions of the Metropolitan Poor Act of 1867 and to the issue under that Act of an order of the Poor Law Board virtually uniting the whole metropolis into one district for the purpose, amongst others, of providing hospital accommodation for paupers suffering from small-pox.

464. Although the Metropolitan Asylums Board had power to provide hospital accommodation for paupers only, they found it practically impossible to confine the inmates of their hospital to this class owing to the epidemic which prevailed at and after the time when their first hospital was opened in December 1870.

465. In 1879, by the Poor Law Act of that year, power was given to the Metropolitan Asylums Board to contract with the local authorities for the reception into the Board's hospitals of any persons suffering from small-pox or other dangerous infectious disorder within their districts, but it was not until 1889 that express power was given to the Asylums Board by the Poor Law Act of that year to admit persons reasonably believed to be suffering from small-pox who were not paupers.

It will thus be seen that the hospitals of the Asylums Board have been practically the only isolation hospitals available for London, though to some extent the Highgate Hospital has served the same purpose.

466. A return made in 1879 showed that at that time 296 out of 1593 (or about 18 per cent.) of the sanitary authorities of England and Wales, other than the Metropolitan or port sanitary authorities, had made some provision for the isolation of cases of infectious disease. A similar return relating to the conditions existing in December 1892 shows that by that time **36.6 per cent.** of the same sanitary authorities (representing districts together containing 62.1 per cent. of the total inhabitants) had some provision for the isolation of infectious diseases, either in hospitals of their own or by arrangement with neighbouring authorities, and that **20.4 per cent.**

of these authorities (representing districts containing together 44.6 per cent. of the total inhabitants) had special accommodation for small-pox patients. In addition, it appears that 45 of the 57 port sanitary authorities then existing (exclusive of the Port of London) in England and Wales had arrangements of some kind for the isolation of infectious diseases; 12 of these 45 then having special accommodation for small-pox patients.

467. **The value of isolation in restricting the spread of small-pox has been long acknowledged by the Medical Officers of the Local Government Board.**

Dr. (afterwards Sir George) Buchanan, in a report made in 1874, expressed the opinion that

small-pox, as well as other infections, is capable of being wonderfully limited by isolation 'in hospital, and the amount of provision made for such isolation may be expected to affect materially the rate at which an epidemic of small-pox becomes extinguished.

In proof of this he adduces a striking comparison of the behaviour of the epidemic of 1870-1 in Birmingham, London, and Coventry. Again, the 1871 epidemic was prolonged in Plymouth, but quickly extinguished in adjacent Devonport, the only difference between the two being the more rapid and copious hospital provision in the case of the latter.

468. Evidence bearing on the same point was given by Dr. Thorne before the Royal Commission which in 1881-2 inquired into the subject of small-pox and fever hospitals in London.

Speaking of hospitals for infectious diseases generally, he said,

The evidence is so abundant that **I could occupy you for hours in telling you of instances in which epidemics have evidently been prevented by the isolation of first cases of infectious disease.**

As regards small-pox in particular he cites two striking examples,

Before the erection of the Delancey Hospital at Cheltenham, small-pox had frequently led to some considerable mortality; in 1858 it caused 52 deaths, in 1861, 12 deaths, in 1865, 32 deaths, but **during the six years which had elapsed between the provision of the hospital and my inquiry, small-pox had been imported into Cheltenham on 12 different occasions; the imported cases were, in every instance, removed to the hospital, and in no single instance has the disease spread beyond the house first attacked!**

Again, he says:

At Birkdale, in Lancashire, the spread of small-pox was, in 1876, successfully checked by the isolation of a few first attacks. At Wigan, the isolation of a first imported case, both in 1877 and 1878, prevented any further attack. At Maidstone I found that **there had never been any spread of small-pox in any house from which the medical officer of health succeeded in removing to hospital the first patient attacked.** Indeed, **it was everywhere found that** where a hospital for the reception of infectious diseases was kept in actual readiness for the admission of patients, and **where removal could be effected at the outset of the disease, the isolation of cases of small-pox had prevented any extension of infection.**

Dr. Thorne says:

It is really more striking as regards small-pox than any other disease, because **small-pox can be more easily isolated**; the friends of the patient, and they themselves being

so much more willing to submit to isolation, than when suffering from any of the other specific fevers.

He adds, however, that “efficient vaccination must be considered as a probable influence in contributing to the results.”

It is to be observed, too, that Dr. Thorne expressed the opinion that after an outbreak of small-pox had proceeded a certain way, the influence of a hospital for good upon the population would be very small indeed, that it would be good so far as concerned the individual house from which the patient was removed, but that it often had but little influence upon the general body of the epidemic.

469. After the hospitals established by the Metropolitan Asylums Board had been employed for some time for the reception of persons suffering from small-pox, attention was called to the fact that **the number of cases of the disease in the neighbourhood of the hospitals was apparently in excess of the number found in streets further removed from them**, and a suspicion was aroused that the **hospitals were themselves causing a spread of the disease**. There had appeared, according to Dr. Thorne, to be ground for believing that in the case of two provincial hospitals, one at Maidstone and the other at Stockton, the inhabitants of dwelling-houses in their neighbourhood had suffered owing to proximity to these institutions. In consequence of the suspicion which existed as to the influence of London hospitals in spreading the disease a careful investigation was Taacle for the Local Government Board by Mr. Power of the circumstances relating to the Fulham small-pox hospital. In the result, he came to the conclusion that **the Fulham hospital, with all its advantages of site and construction, and with the many excellences of its administration, had, by dissemination of small-pox material through the atmosphere, given rise to an exceptional prevalence of small-pox in its neighbourhood.**

470. The matter was felt to be of so much importance that a Royal Commission was appointed to consider the prevention and control of epidemic infectious diseases in London and its neighbourhood.

The Commission arrived at the conclusion that it “appeared clearly established,” by the experience of the five hospitals maintained by the Asylums Board for small-pox patients, that “by some means or other the **asylum hospitals in their present shape cause an increase of small-pox in their neighbourhoods.**” They accordingly recommended that these hospitals, which, in their judgment, should be no longer used to anything like the extent they then were for cases of small-pox, should become, in the main, fever hospitals, and that mild and convalescent cases of small-pox should be provided for in two or three more country hospitals, it being apparently thought impracticable to remove acute cases to such hospitals.

471. Towards the end of the year 1883 the Metropolitan Asylums Board, who had already made some use of a hospital camp at Darenth, and a hospital ship, the “Atlas,” moored at Greenwich, for the treatment of small-pox patients, decided to make important changes in its method of dealing with London small-pox.

The “Atlas” hospital ship was moved to Long Reach, about 20 miles below London Bridge, and well without the metropolitan area, and re-opened in February 1884; the hospital camp at Darenth was re-opened early in the following month; in June of the same year a second hospital ship, the “Castalia,” was opened alongside the “Atlas,” and a second hospital camp opened at Darenth; and from February to October 1884 the cases of small-pox received by the Board were

dealt with in the following manner: Cases of small-pox were received at first at three, and afterwards at six, intra-urban hospitals and there treated—(in May the hospitals at Hampstead and Fulham had been re-opened for this purpose and a sixth hospital hired at Plaistow, just beyond the metropolitan boundary but in a populous district)—but the number of cases under treatment in each intra-urban hospital at any one time was not allowed to exceed 50, mild and convalescent cases being thence transferred from time to time to the hospital ships and camps, where their treatment was continued; after the middle of June mild cases of small-pox were also received on the hospital ships directly from their homes. Complaints, however, again arose that some of the six intra-urban hospitals, and even that the hospital camps at Darenth, were spreading small-pox in their vicinity, legal proceedings being instituted with reference to the use of the latter; and from October 1884, though the Board continued for a time to follow the same method of dealing with cases of small-pox, but the number of cases under treatment in each intra-urban hospital at any one time was not allowed, as a rule, to exceed 25.

472. Finally, in July 1885, the Metropolitan Asylums Board decided thenceforward to treat, in the first instance, on the hospital ships, all cases of small-pox received by the Board, unless the condition of the patients made their removal to the ships dangerous; and the Board's arrangements, well designed and well carried out, for the conveyance of patients thereto, have since been found to admit of practically the whole of the cases being taken to the ships. As a relief to the hospital ships in times of small-pox epidemics, the Board erected in 1888-9, and extended in 1893-94, at Darenth, on a site near that before used for the hospital camps, a hospital primarily intended for cases convalescent after small-pox, which was so used during the later part of the small-pox outbreak of 1892-94. The Metropolitan Asylums Board have also provided, since 1881 a partial, and since 1889 a complete, ambulance service for London smallpox; and so well has the service, which formerly was often an undoubted means of infection, been carried on by the Board that it may, in this connexion at least, be taken that no spread of infection has occurred from the Board's ambulances.

473. In many of the large towns of England the notification of infectious diseases, including small-pox, has been at different times adopted, and steps have been taken to provide hospital accommodation where patients suffering from small-pox could be received, and endeavours made with more or less vigour to isolate cases of the disease by removing them to a hospital. We shall advert presently to the effect of these measures in the metropolis and some provincial towns. We may mention here, however, that the experience in London, that the collection of a considerable number of small-pox cases in hospitals situate in or near populous districts tends to a spread of the disease, has had its counterpart in provincial towns, though the greater numbers collected in one place have, we believe, made the evil more felt in London than elsewhere.

474. The reports upon recent provincial epidemics to which we have so often referred contain evidence bearing upon the danger of spreading the disease if considerable numbers of small-pox patients are aggregated in hospitals situate in populous neighbourhoods. Thus in Sheffield the Winter Street hospital appears to have led in the epidemic of 1887-88 to a dissemination of the disease in the vicinity. The site of the hospital has been since changed. Again at Leicester it was observed during the epidemic of 1892-93 that the amount of small-pox round the hospital was abnormally great when compared with the other parts of the town. And there was a similar experience at Warrington and other places.

475. As regards Scotland, the yearly abstracts of public health expenditure, given in the more recent reports of the Board of Supervision, enable us in some degree to judge of the extent to

which local authorities have exercised the power to provide, or to join in providing, isolation hospitals for the use of the inhabitants of their districts, given to them by the Sanitary Act of 1866, and again by the Public Health (Scotland) Act of the following year. The earlier of those Acts, not having been framed with special reference to the local institutions of Scotland, was practically inoperative in that part of the United Kingdom, but some few local authorities may have from the first exercised their powers in this respect under the Act of 1867. The abstracts of expenditure given by the Board of Supervision do not enable us, however, specially to distinguish expenditure in connection with the provision or maintenance of hospital accommodation incurred prior to the year ending the 14th May 1873. From that year onwards the proportion, year by year, of local authorities making any such expenditure, however small, is shown by the following table:—

Year.	Proportion in each Year of Local Authorities making any Expenditure at all in connection with the Provision or Maintenance of Hospital	Year.	Proportion in each Year of Local Authorities making any Expenditure at all in connection with the Provision or Maintenance of Hospital
Ending 14th May 1873	5 per cent.	Ending 14th May 1884	13 per cent.
" 1874	5 per cent.	" 1885	13 per cent.
" 1874	6 per cent.	" 1886	13 per cent.
" 1875	7 per cent.	" 1887	13 per cent.
" 1876	7 per cent.	" 1888	15 per cent.
" 1877	8 per cent.	" 1889	16 per cent.
" 1878	9 per cent.	" 1890	17 per cent.
" 1879	10 per cent.	" 1891	34 per cent.
" 1880	10 per cent.	" 1892	39 per cent.
" 1881	11 per cent.	" 1893	44 per cent.
" 1882	12 per cent.	" 1894	49 per cent.
" 1883	476 per cent.		

476. The largely increased proportion of local authorities making some expenditure in connection with the provision or maintenance of hospital accommodation during the year ending the 14th May 1891, as compared with the proportion in the previous year, probably does not indicate any material increase in the amount of hospital accommodation provided. At the beginning of that year (*i.e.*, in May 1890), under the provisions of the Local Government (Scotland) Act of 1889, there were substituted for certain of the local authorities under the Public Health (Scotland) Act of 1867 a very much smaller body of authorities, representing larger areas in which the districts of the former authorities were merged. Apart, therefore, from any increase which may have followed in the amount of hospital accommodation provided, the effect was naturally to increase the proportion of local authorities making some expenditure in connexion with the maintenance of hospital accommodation.

At the same time the success, in this respect, at all events, of the policy of this substitution, is strikingly shown by the increased proportion of local authorities making some expenditure in connection with the provision or maintenance of hospital accommodation during the year ending the 14th May 1892, and during each of the two following years, as compared with the proportion during the year ending the 14th May 1891.

477. In the case of Ireland, we are able to judge to some extent of the proportion of cases of small-pox which, prior to the enactment of the Sanitary Act of 1866, was treated in hospitals or infirmaries of some sort. The inquiries, to which we have already referred, made on the taking of

the census in 1841, in 1851, in 1861, and in 1871 gave the following results:—[Census reports of Ireland: in 1841, pp. xii, xiii, lix, and lx, and pp. 182 and 194-204 of. Surgeon Wilde's Report; in 1851, part v., vol. i., pp. 364-5 and 423, and vol. ii., pp. 70, 110, and 122; in 1861, part iii., vol. ii., p. 20, and (in the tables) pp. 66, 106, and 118; and in 1871, part ii., vol. ii., pp. xxxvii, 122, 154, 168, and 256.]

58,006 persons were returned as having died of small-pox during the inter-censal period 1831-41. Of these 58,006 deaths, 19 occurred in the few Poor Law institutions which had been opened towards the close of the period; 16 occurred in county hospitals; 5 in prison hospitals; 38 in other general hospitals; and 49 in fever hospitals. So that altogether 127 out of the 58,006 deaths (or 0.2 per cent.) occurred in these institutions.

38,275 persons were returned as having died of small-pox during the inter-censal period 1841-1851. Of these 38,275 deaths, 5,016 (or 13.1 per cent.) occurred in Poor Law institutions; 8 occurred in county hospitals; 4 in prison hospitals; 26 in other general hospitals; and 593 in fever hospitals. So that altogether 5,647 out of the 38,275 deaths (or 14.7 per cent.) occurred in these institutions.

12,727 persons were returned as having died of small-pox during the inter-censal period 1851-61. Of these 12,727 deaths, 1,118 (or 8.8 per cent.) occurred in Poor Law institutions; 4 occurred in county hospitals; 9 in prison hospitals; 57 in other general hospitals; and 187 in fever hospitals. So that altogether 1,375 out of the 12,727 deaths (or 10.8 per cent.) occurred in these institutions.

4,113 persons were returned as having died of small-pox during the inter-censal period 1861-71. Of these 4,113 deaths, 435 (or 10.6 per cent.) occurred in Poor Law institutions; 2 occurred in county hospitals; none in prison hospitals; 22 in other general hospitals; and 107 in fever hospitals. So that altogether 566 out of the 4,113 deaths (or 13.8 per cent.) occurred in these institutions.

478. The figures just given relate to deaths from small-pox only and not to all cases of that disease however terminating. But unless the rate of fatality during the periods to which they relate was considerably lower amongst cases of small-pox treated in the institutions mentioned than amongst cases treated outside, which is unlikely to have been the case, we may infer from the figures that in Ireland the proportion of cases of small-pox which were treated in hospitals or infirmaries of some sort did not materially exceed 0.2 per cent. during the inter-censal period 1831-41, 14.7 per cent. during the inter-censal period 1841-51, 10.8 per cent. during the inter-censal period 1851-61, and 13.8 per cent. during the inter-censal period 1861-71. It must not, of course, be assumed that the cases so treated were effectually isolated during their treatment.

479. We have not the same means of estimating the proportion of cases of smallpox in Ireland which have been treated in hospitals or infirmaries of some sort since the close of the inter-censal period 1861-71. The power, given to local authorities by the Sanitary Act of 1866 and again by the Public Health (Ireland) Act of 1878, to provide, or to join in providing, isolation hospitals for the use of the inhabitants of their districts, has been exercised in Ireland to a far less extent than the similar power in England and Scotland; indeed, except in the case of some few towns in quite recent years, it can scarcely be said to have been exercised at all. On the other hand such isolation of cases of small-pox as may have been effected by their treatment in Poor Law institutions was carried out more generally in Ireland during the decennial period 1871-80 than during any of the inter-censal periods to which we have referred, and still more

generally and indeed to a very large extent during the next decennium 1881-90. The returns of deaths in workhouses from small-pox, given in the annual reports of the Local Government Board for Ireland, show that the proportion of the deaths from small-pox in Ireland which occurred in those institutions was about 25 per cent. during the period 1871-80, and about 65 per cent. during the period 1881-90. Unless, therefore, the rate of fatality during these periods amongst cases of small-pox treated in those institutions was materially different from the rate of fatality amongst cases treated outside, it would appear that about one case of small-pox out of every four during the period 1871-80, and about two cases out of every three during the period 1881-90, were treated in Poor Law institutions.

480. Passing now to a consideration of the effect produced by a notification of cases of small-pox and the steps taken to isolate them, we naturally begin with Leicester.

The method there employed in dealing with small-pox has attracted much attention, and is often spoken of as the “**Leicester system.**”

As some discussion has arisen as to the exact procedure under the Leicester system, it will be well to briefly state in what it consists. On the receipt of a notification at the Health Office, a telephonic message is sent to the hospital to prepare for the reception of a patient, and to despatch the ambulance; the sanitary inspector at once proceeds to the house notified, and urges the removal of the patient to hospital, and also the removal of those who have been in contact with him to the quarantine wards near the hospital. **There is rarely any difficulty in securing the removal of the patient; in the case of the other inmates of the infected house, there is no power, of compulsory removal, but persuasion has generally been successful.**

If a person liable to infection is not quarantined, he is visited daily by the inspector; he is warned against going to work, or undue exposure, but is not confined to the house.

Compensation has been given in some cases. The history of the small-pox patient is then inquired into, especially his whereabouts, and the persons he has been in contact with during the preceding fortnight, and any clue of infection is vigilantly followed up. Meanwhile, the house is thoroughly disinfected, and clothing is either burnt or sent to the steam disinfectant on the hospital grounds. There are 28 beds ordinarily set aside for small-pox in a separate pavilion at the hospital; in another building, fenced off from this but very near it, cases of scarlet fever are received, and the quarantine wards are separated from the fever wards by a corridor only.

If no small-pox appears among those quarantined, they are allowed to return after 14 days; vaccination or re-vaccination is offered them, but it has **not been largely accepted.** From 1877 to 1891 inclusive it appears that 183 persons were thus quarantined, and 103 patients were treated in the small-pox hospital. Of 14 persons quarantined in 1887 two developed small-pox, and of 39 quarantined in 1888 three developed small-pox.

481. Leicester suffered severely from small-pox in 1872, 346 deaths having been registered as caused by it. Two deaths from that disease occurred in 1873, but no other, until 1877, when there were six, and one in the following year. The next year in which small-pox deaths were registered was 1881. There were two in that year and five and three in the following years. No other death took place until 1892. and 1893, in which years the fatal cases numbered 21.

Prior to 1875 the vaccination laws were well observed in Leicester. In that year the number of children born who were unaccounted for was only some 4 per cent. Since then there has been, as we have seen, a marked and progressive decline in the number of vaccinations, especially since 1883, until at the present time 80 per cent of the children born remain unvaccinated.

482. The borough, hospital for infectious diseases was erected in 1871-2 outside the town; though within the last few years houses have been built in 'proximity to it. It appears to have been with Dr. Crane, the Medical Officer of Health in 1875, that the quarantining the inmates of an infected house, in addition to isolating the patient, originated. His successor, Dr. Johnston, established it in 1877 as a regular system. He was aided in this, after 1879, by the notification of infectious diseases then rendered compulsory by a private Act which Leicester, anticipating most other towns, obtained in that year. Dr. Johnston reported that up to 1884 the spread of small-pox from imported cases had been arrested in 20 instances by the means he adopted.

His successor, Dr. Tomkins, though, like his predecessors, regretting the increasing disuse of vaccination, bore testimony in his annual reports to the efficacy of the measures adopted in Leicester, and expressed his opinion that had such a system been in force at Sheffield in 1887 it would not have suffered in the way it did.

483. In 1892 small-pox became prevalent in different parts of England, especially in Lancashire and Yorkshire. Many of the large provincial towns suffered, and Leicester amongst them. There were in 1892-3, 357 cases of small pox in Leicester, of whom 21, or 5.8 [per cent] died. 193 households were invaded, containing 1,234 persons. The first importation was by a tramp, whose disease, passing unrecognised, caused infection at a common lodging-house and at the workhouse. 11 other importations of the disease by tramps occurred in the course of 1892-3. When the first cases were removed to the hospital the fever wards were full of children suffering from scarlatina, and others, convalescent from that disease, were lodged in a neighbouring pavilion. It is not surprising that a number, amounting in all to 13, of the scarlatinal children caught small-pox; some of these apparently from contact with a child who, during quarantine, developed a scarlatinal rash, and later an eruption, which was at first erroneously thought to be chicken-pox. The children from the fever wards were sent home in October 1892, but six of them were re-admitted to hospital with small-pox within a fortnight. From this time onward the whole of the hospital was devoted to small-pox cases, and to quarantined persons. It was, however, soon found impossible, for lack of accommodation, to remove all the inmates of the infected houses to the quarantine wards at the hospital; and from May 1893 onwards, quarantine was superseded by a system of daily visitation and inquiry.

484. An analytical study of the incidence of small-pox on 193 households, containing 1,234 inhabitants, shows that in the 170 instances in which the first or only case of small-pox was removed to hospital, 85 cases occurred among the 915 other inmates, or 9.2 per cent. In the 23 instances in which the first or only case of small-pox remained at home, 42 cases occurred among the 126 other inmates, or 33.3 per cent. Both in the vaccinated and the unvaccinated a far greater proportion of the inmates were attacked when the first case remained at home than when removed to hospital.

The influence of promptitude in removal upon the development of secondary cases is shown by the following facts. In 120 of the 170 houses from which the first or only case of small-pox was removed, there were no further cases. Removal had been effected on or before the fifth day of attack in 60 per cent. of the cases so removed. In the remaining 50 houses out of the 170, one or more further cases of small-pox occurred. Removal had been effected on or before the fifth day in only 38 per cent. of the first cases occurring in these houses.

485. The evidence derived from the complex conditions which obtained at Leicester during the outbreak of 1892-3, is inconclusive as to the relative merits of quarantine in hospital or

supervision- of the exposed at their homes. The influence of prompt isolation of the patient appears to overshadow any superior efficacy the one, method may have had over the other.

486. Leicester suffered less than many of the other large towns which have been invaded by small-pox during recent years, both in the number of cases and in the number of deaths. In connexion with this, however, a point to which we have already called attention must be borne in mind. The disease was remarkably slight there in its fatality, even as regards those who, by reason of their age, could not be affected by the change of practice in relation to vaccination. Dr. Priestley, the Medical Officer of Health, claims, in his report to the Sanitary Committee for 1893, that it was by reason of the energetic methods adopted that, the disease had been prevented running riot through the town. His claim may be well-founded. At all events, **the experience of Leicester affords cogent evidence that the vigilant and prompt application of isolation, &c.,** even with the defects which were brought to light during the recent epidemic, is a most powerful agent in limiting the spread of small-pox. It is true that the system and appliances which appeared adequate for some years failed to prevent a serious outbreak of small-pox in 1892-3. We think its value was none the less real. We shall consider the matter further when we come to review the whole of the evidence on the subject of isolation and notification.

487. **The system of isolation has been adopted more or less completely in many provincial towns, and has there proved of value.**

At Sheffield, during the epidemic of 1887-8, there was no compulsory notification, though a voluntary system of notification by medical men had been in vogue since 1885. Only one-fourth of the 32 cases of small-pox known to have occurred during the first three months of the epidemic were thus notified. Though the proportion of notified cases increased as the epidemic progressed, it is evident that during the most important period the system must be regarded as having failed. The borough hospital in Winter Street, which for a considerable period was the only hospital in use, did not provide adequate accommodation for patients, and became overcrowded; moreover, being in proximity to a densely populated area, it became the means of spreading the disease. Cases of small-pox were accordingly treated in buildings or huts in connexion with the Sheffield and Eccleshall Unions' Workhouses, and the disease spread to inmates of the workhouses. Nevertheless, evidence is forthcoming from Sheffield of the great advantage to individual households of early removal of first cases. Dr. Barry says:—

The advantages arising to individual households from the early removal of small pox cases to hospitals were clearly seen in the earlier months of the epidemic. From its commencement to the middle of July, during which period, with comparatively few exceptions, all cases of small-pox which came to the knowledge of the Health Department were at once removed to hospital, **it was exceptional to have a recurrence of the disease in the same household.** After the middle of July, in consequence of the insufficiency of hospital accommodation, a large and increasing proportion of small-pox cases had to be treated in their own homes, and multiple cases in families became of frequent occurrence.

The beneficial effect upon groups of households and districts of the early removal of cases to hospital is evident from the following notes with regard to the sub-districts of South Sheffield, Attercliffe, and Upper Hallam, all districts at a considerable distance from the hospital.

Small-pox was introduced into South Sheffield in July, during which month two persons living in different houses contracted the disease. Both cases were at once removed to

hospital. During August two more houses were invaded, and the cases were similarly dealt with. No fresh cases occurred in this district till October, when the disease was again introduced, and in consequence of the want of accommodation in the hospitals, cases had to be treated at home. During this month 25 households were attacked, and from this time onwards the number of fresh households affected rapidly increased.

Small-pox was introduced into Attercliffe in the third week in July, and the person who had contracted the disease was at once removed to hospital. No further case occurred in this district until in the fourth week in August a house situated in a different part of the district to that last mentioned became affected. In consequence of the want of accommodation in the hospital it was two or three days after the development of the disease before this case could be removed, and in the following fortnight six new cases occurred, of which three were in the same house as the person above referred to. Of the three cases in fresh houses two were removed to hospital and one was treated at home. In the following fortnight two fresh houses in the same neighbourhood were invaded, and from this time cases occurred more frequently. In October there were 11 new cases, in November 24, in December 67, in January 1888, 140, in February 150, and in March 170, only a small proportion of these later cases being removed to hospital.

In Upper Hallam the first case of small-pox was reported to have occurred on June 18th. This was at once removed to hospital, as was also a second case which occurred on July 1st. No further cases were reported to have occurred in this district till September 20th, when there was a case which was also at once removed to hospital. From that date till December 29th, when the disease was re-introduced, no more were reported to have occurred in the district.

The experience gained in 1887-8 has borne fruit; in 1889 Sheffield adopted the Compulsory Notification Act, and when small-pox broke out there **in 1892-3 all cases were promptly removed to the new hospital at Lodge Moor**, four miles from the centre of the town and in an isolated position. So convinced is the medical officer of the need for isolating those attacked that he is in favour of insisting on removal in any case. Moreover, provision has been made at Lodge Moor for isolating members of infected families, or others who have been exposed to infection and quarantining them for 15 days. 18 persons were thus quarantined in the outbreak of 1892-3. To these measures and to the influence of the epidemic of 1887-8, when 6,088 persons suffered from small-pox, of whom 589 died, as well as to the numerous cases of re-vaccination, is ascribed the non-extension of the disease in 1892-3. Sheffield had obeyed the vaccination laws better even than the average of large towns. Had there been prompt removal of first cases to adequate and suitable hospital accommodation in 1887, it is in the highest degree improbable that the disease would have run riot as it did. It is important to notice that the rapid spread of the disease at the commencement of the epidemic of 1887-8 seems to have been due to the fact that some of the early cases were of so mild a character that they passed unobserved.

488. At Halifax in 1893, owing to inadequacy of accommodation, an attempted quarantine of infected households at the hospital broke down, the disease was spread from common lodging houses, and invaded the poorer portions of the town, and was especially prevalent in the neighbourhood of the small-pox hospital.

489. At Bradford the fever hospital has on many occasions since 1874 afforded isolation for small-pox cases, and effectually prevented its spread in the borough. It was formerly in an isolated situation, but houses have now been built close to the walls of the hospital grounds,

and in these there was a special incidence of the disease in 1893. Owing to the prevalence of scarlet fever, the accommodation for small-pox proved inadequate, and a temporary hospital was erected at Scholemore. Unfortunately a fire broke out here in October 1893, necessitating the removal of the patients, and causing a further extension of the disease as well as seriously dislocating hospital isolation. Quarantining was only attempted on a small scale at Bradford, in a house accommodating four persons.

490. Without entering into further details, we may state that the advantage of hospital isolation has been felt in Glasgow, Leeds, and other towns.

491. We have already directed attention to the fact that it was practically speaking not until 1871 that hospital accommodation was provided in London, which rendered possible the removal from their homes of persons suffering from small-pox, and we have detailed the measures adopted from time to time for that purpose.

As these facilities were augmented, the proportion of cases treated in the Metropolitan Asylums Board's hospitals steadily increased:—

Years.	Number of Deaths from Small-pox registered in London, or (of London Residents) in the Metropolitan Asylums Board's Hospitals situated outside London.	Number of Deaths from Small-pox in the Metropolitan Asylums Board's Hospitals.	Deaths in Metropolitan Asylums Board's Hospitals—Per Cent. of Total Deaths.
1871-2	9,643	3,020	31
1881 -	2,373	1,431	60
1893 -	206	180	87

The deaths shown by the table in the last of these years are not those which occurred in the hospitals during that year, but the deaths of patients who during that year were admitted to the hospitals. This does not, however, detract from the importance of the figures as evidence of the great increase in the proportion of small-pox cases treated in the hospitals.

492. The Royal Commission to which we have referred, in their Report made in July 1882, contrasted the amount of small-pox in London with that which had occurred in England generally. It will be well to bring such a comparison down to the present time and to notice the features which it presents.

The following table affords a comparison between the mortality in London and that in England and Wales with the metropolis excluded, the deaths being those from small-pox to every 100,000 living. The figures are taken for the five years 1838-42, and from 1847 onwards in decennial periods, the figures for the years 1843-6 not being procurable.

	Mean annual Deaths from Small-pox; to every 100,000 living.	
	England and Wales, excluding London.	London.
1838-42	54.5	77.1
1847-56	23.6	34.6
1857-66	20	26.8
1867-76	22.5	41.9
1877-86	3.3	27.4

493. It will be seen that during the second and third periods, there was a great reduction of mortality both in England, excluding the metropolis, and in London; though it must be remembered that 1838-42 includes 1838, in which there was a considerable epidemic. The great epidemic wave of small-pox which swept over the country in 1870-1, and which made itself felt in almost every part of Europe, naturally produced a sensible effect on the mortality of the next decennium, but it is to be noted that its effect was much more serious in London than outside the metropolis. The mortality there, though raised higher than in the previous decennium, did not reach the point at which it stood in the decennium before that. In London, on the other hand, the mortality largely exceeded that of the two previous decennia. Again it is to be observed that though in the next decennium the mortality fell, both in England generally and in the metropolis, the fall was very different in its extent; outside the metropolis it was vastly greater than within it. It is only since the year 1885 that the condition of London has been at all comparable as regards the amount of small-pox mortality with the rest of the country. The corresponding figures for the years 1887-94 to those given above are as follows:—

	England and Wales,		London.
	1887-94	2.0	1.0

494. In the Report of the Royal Commission of 1881, already alluded to, suggestions were made with regard to notification and isolation which have since been largely carried into effect. As we have said, it was considered proved that the existing small-pox hospitals had caused a spread of the disease in their neighbourhood. We cannot but think that this may in some measure account for the greatly increased mortality from small-pox in London during the 1871-72 epidemic as compared with the rest of the country. It is true that the statistics relating to England and Wales outside the metropolis include those of other large towns where the same evil was present, but it probably did not exist then in so aggravated a form, and the effect may be neutralised by the statistics relating to smaller towns and rural districts with which they are combined. This idea has been suggested to us, as the result of the inquiry, how it has come about that whilst the metropolis, in the decennium 1867-1876 and again down to 1885, compared so unfavourably with the rest of the country, the condition has since that date become so entirely changed? We think it is impossible to attribute this change to vaccination. There is no reason to suppose that the position of the metropolis in respect to vaccination has, since the year 1885, become superior to the rest of England and Wales; rather the other way, as the decrease in infantile vaccination has been greater during the last few years than in the rest of England and Wales. The change, therefore, must be due to some other cause.

495. The hospitals which, in the opinion of the Commissioners, were propagating the disease in their neighbourhood, were in operation down to July 1882, when their Report was made. In 1877 and 1878 and again in 1881, small-pox was epidemic in London to a considerable extent.

We have stated in detail in paragraph 471 the steps which were taken by the Metropolitan Asylums Board in consequence of the recommendations of the Royal Commission. It will be seen that the intra-urban hospitals still continued in use, and that complaints were made in 1881 that they were spreading small-pox in their vicinity, although the number in each of them was not allowed to exceed 50. In October 1884 this number was reduced to 25. It was not,

however, until 1885 that the system, now in operation, was inaugurated, and all cases of small-pox were treated in hospital ships. It is impossible not to be struck with the fact that it is, since the year 1885, that the metropolis has presented so satisfactory an aspect as regards small-pox mortality. The facts to which we have been calling attention certainly seem to point to the conclusion that this has been due to a system of isolation, well organised and administered, the beneficial effect of which is DO longer neutralised by a spread of the disease from the hospitals in which the isolation is carried out.

Upon the whole, we think the experience of London affords cogent evidence of the value of a sound system of isolation in checking the spread of small-pox.

496. The experience of isolation systems in Australia is interesting and worthy of special notice, because whilst in this country the quarantining of persons who have come in immediate contact with those suffering from small-pox has only been possible with the consent of the persons whom it was proposed to subject to quarantine, in Australia their removal to a place of isolation has been made compulsory.

497. Australia, by virtue of its geographical position, and the consequent separation by long sea voyage from infected ports, enjoyed for a long time a sort of natural isolation. Thus, Hirsch, in his "Historical and Geographical Pathology," Vol. I., pp. 133-4 (1881), remarks:—

The continent of Australia up to 1838 had enjoyed an absolute immunity from small-pox; towards the end of that year the disease appeared at Sydney, having been imported probably from China; it lasted, however, only a short time, and remained absent from the continent until 1868. In that year it was introduced into Melbourne by a ship, and again it spread only to a slight extent, and quickly died out. By a rigorous inspection of ships on their arrival, it has been found possible to prevent subsequent importations, a notable instance of prevention having occurred in 1872. Tasmania has hitherto quite escaped the disease; so also has New Zealand, where an importation of it in 1872 was prevented by strictly isolating a vessel that had arrived with small-pox on board.

In New South Wales, Dr. MacLaurin, who has been President of the Board of Health since 1889, informed us that the Government act on the assumption that small-pox is an exotic disease, and that every case must have come from outside the colony, and it is therefore dealt with under a quarantine Act of William IV., originally instituted for dealing with cholera. By an Act passed in 1882, notification of smallpox was made compulsory on medical men and householders under heavy penalties. At Sydney notification of small-pox is followed up by the compulsory removal of the patient and all persons who have been in the house with the patient to the quarantine station at North Head. This station is 670 acres in extent, and situated on the peninsula at the mouth of Sydney Harbour, and is seven miles from the Health Office, with which there is telephonic and telegraphic communication. The persons are conveyed to the station by a steamboat comfortably fitted expressly for the purpose, and no difficulty has been experienced in effecting their removal. It was, in Dr. MacLaurin's opinion, by carrying out this practice of isolation and quarantine that "the epidemic of 1881-82 was suppressed," and small-pox "has never become epidemic since this plan has been adopted." The persons who have been in the house with the patient are detained 21 days in quarantine from the date of the last possible contagion. Should a case of small-pox arise among them, those who had been in contact with such infected person would be detained for a further period of 21 days, and so on. To facilitate this the exposed persons are distributed in separate groups within the station. They are allowed to receive letters or parcels, &c., and a telegraph operator is employed, "whose

special “ business it is to work the telegraph at their request.” “Reasonable compensation is “given by the Government for loss; “ and there are heavy penalties under the original Act whereby the quarantine is secured. The station is, according to Dr. MacLaurin, “a pleasant place to stay in, and everything is done that can be done to make the “ people comfortable; they have nothing whatever to do, and are free from all care, “ and they can spend the day pleasantly enough; hut they do not like it.” No one, however, raises any objection to the Sydney system; “the people are all very sensible about it.” In all Australian towns the same system is carried out as strictly, with the result that there was not a case of small-pox in Australia on the 5th February 1890; and Dr. MacLaurin is of opinion that the risk of dying of small-pox in Australia is smaller than in any other part of the world. As regards vaccination: —In New South Wales it is very little practised; there is no compulsory Act; and though medical opinion is in favour of it, an opinion shared by Dr. MacLaurin, it is not .likely that a compulsory Vaccination Act could be passed or would be tolerated. The proportion of young persons in New South Wales who are not vaccinated is accordingly very large; probably much more than half of those under ten years of ago are unvaccinated. Although Dr. MacLaurin favours vaccination and respects it highly, **he is satisfied that the system of isolation as supervised by him is perfectly successful.** As President of the Board of Health he considered it his business to produce extinction of the disease; he does not consider vaccination a sufficiently absolute protection for such purpose; and he is

fully of opinion that **the only way in which you can bring to an end an outbreak of small-pox**, that is to say, to bring it under control, and not leave it to work itself out, is by notification and **isolation**. Of course in any small community, if you let the disease in it will work itself out in time, because all the susceptible people will have had it; but the only way in which you can absolutely control an epidemic of small-pox is by a system of notification and isolation.

498. Small-pox has never been epidemic in Western Australia. Only one case has occurred within the last 31 years, and that was an imported one; quarantine was carried out and no infection occurred; the immunity from the disease is mainly at least due to isolation. Before 1879 vaccination was not generally practised, a great majority of those born in the colony were unvaccinated; in that year a compulsory Vaccination Act was passed in consequence of Sir H. Ord and Dr. Waylen's representations, and in consequence of reports of small-pox in other colonies, and not on account of the existence of small-pox in Western Australia.

In Tasmania there was a compulsory vaccination law, but it was found to be inoperative because no one was appointed to conduct the prosecutions, and it has now fallen into desuetude. The same system of isolation and quarantine is exercised as in the other Australian colonies. Small-pox was for the first time introduced into Tasmania in 1887, and although preparations for isolation were inadequate, the disease was soon stamped out. Communication between Launceston and Melbourne was temporarily suspended, and to this precaution the non-invasion of Victoria was attributed. The particulars of this, the first introduction of small-pox into Tasmania during the history of that colony, are to be found in a report to the Central Board of Health by Mr. A. Mault, dated November 17, 1887, The origin of the outbreak is not clear, but it was presumed to have been imported, probably by a ship from China, into Launceston. The earliest case reported to the Local Board of Health was on September 23, though it appears that earlier cases had passed unnoticed, or had been notified as measles. 33 cases in all occurred, every one of which was traced to direct infection to the first case. By September 27 a temporary hospital had been erected, and thither patients and suspects to the number of 72 were removed. The last case appeared on October 13. Other persons who had been to the infected houses were isolated in their houses and watched. Only

four of the 47 persons quarantined at the station were attacked. The clothing was burnt, and very thorough disinfection of the infected houses was carried out, and the dead were interred in a special cemetery. The other colonies were communicated with, and quarantine, at first unduly rigid, and afterwards relaxed, was practised against ships proceeding from Tasmania. Although vaccination had been nominally compulsory in Tasmania, it was estimated that two-fifths of the population were unvaccinated.

499. We have no difficulty in answering the question, what means other than vaccination can be used for diminishing the prevalence of small-pox ?—**We think that a complete system of notification of the disease, accompanied by an immediate hospital isolation of the persons attacked, together with a careful supervision, or, if possible, isolation for sixteen days of those who had been in immediate contact with them, could not but be of very high value in diminishing the prevalence of small-pox.** It would be necessary, however, to bear constantly in mind as two conditions of success, first, that no considerable number of small-pox patients should ever be kept together in a hospital situated in a populous neighbourhood, and secondly, that the ambulance arrangement should be organised with scrupulous care. If these conditions were not fulfilled, the effect might be to neutralise or even do more than counteract the benefits otherwise flowing from a scheme of isolation.

500. When we turn to the other branch of the inquiry, **how far such means could be relied on in the place of vaccination**, we find ourselves involved in questions of a much more complicated nature. We have little or no experience to fall back upon. The experiment has never been tried. The nearest approach to a trial of it has probably been in Australia. But even in the parts of that country to which we have alluded the population has not been entirely unvaccinated, though there has been a large unvaccinated class amongst it. Moreover, in applying the experience of Australia to this country two things must be borne in mind. In the first place small-pox has only appeared from time to time, introduced from without at one or other of the ports of the country, and the several colonies of which Australia is composed are of great territorial extent, with few large centres of population. In this country small-pox is always present in some part of it. There has not been a single year without several deaths from the disease. Large centres of population are numerous, and the intercourse between them constant. In the several colonies of Australia the number of ports is not great, the vessels which enter them are comparatively speaking not numerous, and the ports from which they arrive are many days' voyage distant; and there are careful arrangements for quarantining vessels to exclude disease. The shipping which enters English ports is of vast quantity, and passengers are brought in large numbers from the continent of Europe not only daily, but it may almost be said hourly; the voyage, too, is but brief. The other matter to be remembered, is that **part of the Australian system is the compulsory removal to quarantine for 21 days of those who have been in the house with the patient, in addition to the transfer of the patient himself to a hospital.** There can be no doubt that such a system, if completely carried out, would be of the highest efficacy. But it is obvious that **in this country the practical difficulties of working such a scheme in the large towns would be really insuperable**, to say nothing of the difficulty of procuring legislative sanction for it.

501. In order to maintain in efficiency the primary essential condition of a system of isolation, viz., the immediate isolation of a person attacked by the disease, it is requisite to have a hospital always ready with sufficient accommodation for the reception of all such cases, and there are no means of estimating what extent of accommodation will suffice to meet at all times the necessities of a particular town. It is certain that the disease spreads more rapidly, its

contagion seems to operate more actively, at one time than at another. If an epidemic affects a locality, the preparations made for the isolation of small-pox cases, which have proved to be fully adequate in ordinary years, may turn out to be quite inadequate. It is impossible at once to provide the needed hospital accommodation. If the cases are to be removed to a hospital at all, the massing of large numbers together, in itself a means of spreading the disease, might prove inevitable. We have only to look at what happened at Leicester to see how suddenly the necessities of the case may outrun the preparations made for isolation. Moreover, although the vaccination of children had been neglected in Leicester for many years, it would be quite a mistake to regard it as an unvaccinated town. The population over 20 years of age were probably well-vaccinated, and a large proportion of those between 10 and 20 years of age were vaccinated persons. More than half even of those between 7 and 10 years of age at the commencement of the epidemic must be placed in the same category.

502. The question we are now discussing must, of course, be argued on the hypothesis that vaccination affords protection against small-pox. Who can possibly say that if the disease once entered a town, the population of which was entirely or almost entirely unprotected, it would not spread with a rapidity of which we have in recent times had no experience, or who can foretell what call might then be made on hospital accommodation if all those attacked by the disease were to be isolated ? *A priori* reasoning on such a question is of little or no value.

503. **We can see nothing then to warrant the conclusion that in this country vaccination might safely be abandoned, and replaced by a system of isolation.** If such a change were made in our method of dealing with small-pox, and that which had been substituted for vaccination proved ineffectual to prevent the spread of the disease (it is not suggested that it could diminish its severity in those attacked), it is impossible to contemplate the consequences without dismay.

To avoid misunderstanding, it may be well to repeat that **we are very far from underrating the value of a system of isolation.** We have already dwelt upon its importance. But what it can accomplish as an auxiliary to vaccination is one thing whether it can be relied on in its stead is quite another thing.

504. **Even admitting fully the protective effect of vaccination it does not, in our opinion, diminish the importance of measures of isolation or dispense with their necessity.** We think that **steps should be taken to secure a more general provision for the isolation of small-pox patients than exists at present.** We have already called attention to the fact that mischievous results are likely to follow the use as a smallpox hospital of a building situate in a populous place. We think that wherever it is placed it should have sufficient space around it to enable the Sanitary Authority to add rapidly to the accommodation by the erection of temporary buildings.

505. Sanitary Authorities are now sometimes reluctant to provide isolation hospitals. We think that, on a petition by a prescribed number of the ratepayers in a sanitary district, the Local Government Board, if satisfied that hospital accommodation ought to be provided, should have power to make an Order for such provision.

506. Power should, in our opinion, be conferred on Sanitary Authorities to give compensation for loss of wages, and generally for any expenses occasioned either by the isolation of patients, or persons who have come in contact with them, or such supervision of them as is necessary, whether in hospital or elsewhere.

507. Our attention has been drawn to the circumstance that outbreaks of, small-pox have not unfrequently had their origin in the introduction of the disease to common lodging-houses by tramps wandering from place to place. In view of this we make the following recommendations:—

- (i.) That common shelters which are not now subject to the law relating to common lodging, houses should be made subject to such a law.
- (ii.) That there should be power to the local authority to require medical examination of all persons entering common lodging-houses and. casual wards to see if they are suffering from small-pox, and to offer a reward for prompt information of the presence of the disease.
- (iii.) That the local authority should have power to order the keeper of a common lodging-house in which there has been small-pox to refuse fresh admissions for such time as may be required by the authority.
- (iv.) That the local authority should be empowered to require the temporary closing of any common lodging-house in which small pox has occurred.
- (v.) That the local authority should have power to offer free lodgings to any inmate of a common lodging-house or casual ward who may reasonably be suspected of being liable to convey small-pox.
- (vi.) That the Sanitary Authority should give notice to all adjoining Sanitary Authorities of the occurrence of small-pox in common lodging-houses or casual wards.
- (vii.) That where the disease occurs the Public Vaccinator or the Medical Officer of Health should attend and vaccinate the inmates of such lodging-houses or wards, except such as should be unwilling to submit themselves to the operation.

508. In connexion with the subject with which we have been dealing we may advert to the suggestion that **the vaccination and the sanitary authority should in all cases be identical.** It has been pointed out that whilst the isolation of patients in hospitals and otherwise is provided for by the sanitary authority the extent of the provision requisite to deal with the outbreak of an epidemic of small-pox may depend upon the degree in which the vaccination laws have been enforced. More hospital accommodation may be required where vaccination has been neglected than where the vaccination laws have been complied with. It is contended that sanitation and vaccination, concerning as they both do the health of the people, should be under the jurisdiction of a single authority, and that the sanitary authority is the appropriate one for that purpose. Indeed the advantage of placing in the same hands the supervision of vaccination and of the other measures designed to prevent the spread of disease are so great and so obvious that the proposal to do so deserves most serious consideration. Under present arrangements, however, such a proposal raises very great difficulties. Whilst in England and Wales there are only 648 vaccination authorities, the sanitary authorities exceed 1,700 in number. Moreover, whereas in some cases a borough (the council of which is the sanitary authority) comprises parts of several unions, in other cases a single union contains within it many sanitary authorities. For example, the Borough of Bristol includes the whole of one union and parts of two other unions. On the other hand the Huddersfield and Halifax unions contain no less than 25 and 19 urban sanitary districts respectively. Many other instances might be cited to show that it would be impracticable to vest the sanitary and vaccination duties in all

cases in a single local authority without a complete recasting of our present areas of local administration. We are not in a position to devise a scheme which would accomplish either wholly or partially the desired result. At the same time we fully recognise the importance of achieving it as far as possible and we should regard with favour such changes as would render the amalgamation of the vaccination and sanitary authorities feasible, or indeed any steps taken in that direction even although they should only partially effect the object in view.