ON THE MORTALITY OF INFANTS IN FOUNDLING INSTITUTIONS, AND GENERALLY, AS INFLUENCED BY THE ABSENCE OF EXPOSURE AND VOLUNTEER WORK.

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[Read before the Medical Society of London, October 17th, 1857.]

Part 1 (concluded).

Passing on from these general causes of mortality, but which affect more severely foundlings, I proceed to speak of some of those by which children of this class are particularly exposed: and here, in the first place, I should premise that such children are by their very constitution particularly obnoxious to disease. Thus remarks M. De Watteville: *These unfortunate children, generally speaking, have never been injured while yet in their mothers' wombs; a very large proportion suffering, from their birth, from defects of body which, in later life, quite unfit them for labour. And then, it should be added, want of care in infancy, whether in a hospital or when put out at nurse, contributes a great deal to make them weakly and obnoxious to disease.*

**Effect of Removal.** Under this head we have conflicting opinions. From Mr. Wakefield's tables, it appears that 57 per cent. of all children who had been brought from a distance of more than fifty miles died in the hospital, whereas the mortality among other children did not differ more than 4 per cent. difference of 11 per cent. from this cause alone. M. Gaillard brings out the same point by comparing the mortality of foundlings deposited in the town and hospice of Poitiers, as compared with that of infants who were merely removed there from the Maternité. During six warm months, seven of the former died to six of the latter; during six winter months, nineteen of the former died to ten of the latter. At Poitiers most came from a distance, whereas at Lyons they were mostly supplied by the city itself. This appears natural. A child brought a long way very soon after its birth, the mother probably too ill to accompany it, fed in the interim in a very improper manner, weakened by hunger and fatigue, is placed, no doubt, under very unnatural and unfavourable circumstances; yet it is a question how far, in practice, this rule applies. We learn from M. De Watteville's book (Statistique des Etablissements et Services de Bienfaisance, p. 28), that this mortality cannot be due to the transport, since in other cases, where the children are not very ill, and not exposed, the mortality is actually decreased. Thus—

<table>
<thead>
<tr>
<th>Out of</th>
<th>8780 children, aged from 1 day to 2 years.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1290</td>
</tr>
<tr>
<td></td>
<td>1787</td>
</tr>
<tr>
<td></td>
<td>980</td>
</tr>
<tr>
<td></td>
<td>305</td>
</tr>
<tr>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

Exclusive of 8,000 who were taken out of those institutions by their parents, only 13 died during the journey, and 200 only in the first month following their removal. It is notable that mortality is very much below that which obtains in such institutions. No doubt, want of care, and neglect of infants in removal, will increase the mortality; and in this way we may perhaps explain the difference in opinion. This is best considered, however, under the next head.

2. **Effect of Exposure.** No doubt this is a great cause of mortality in foundling institutions. On comparing the French returns before given, the percentage mortality of exposed children, as compared to that of the ordinary foundlings, was as follows:—

<table>
<thead>
<tr>
<th>Exposed Children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the Departments. Highest. Lowest.</td>
</tr>
<tr>
<td>Where it was highest . 87.3 to 60.</td>
</tr>
<tr>
<td>Where it was lowest . 13.2 to 0.</td>
</tr>
</tbody>
</table>

**Foundlings.**

| Where it was highest . 72.4 to 13.4 |
| Where it was lowest . 5.0 to 0. |

| Mean . 26.5 to 3.6 |

(See this table in full, at page 46.)

Upon this point Mr. Brownlow speaks admirably in his very interesting work (Memoranda of the Foundling Hospital) of the great mortality in the building. He says: *This practice of transporting children from remote towns was condemned by Wakefield. He was a distinct resolution of the House of Commons, and a bill was ordered to bring it in to prevent it; but this bill was never presented; so that parish officers and others still continued to carry on their illicit trade, by delivering children to vagrants, who, for a small sum of money, undertook the task of conveying them to the hospital, although they were in no condition to take care of them, whereby numbers perished for want, or were otherwise destroyed; and, even in cases where children were left at the hospital, the barbarous wretches who had the conveyance of them, not content with the gratuity they received, stripped the poor infants of their clothing into the bargain, leaving them naked in the basket at the hospital.* (P. 173.) Mr. Wrottesley, in his report to the House of Commons, states what is almost too horrible to believe—that parents brought their children in a dying state, for the purpose of having them buried at the expense of the hospital. (Report of 1836.)

Mr. Brownlow makes a little further on, the following very pertinent remarks: *It has been truly said, that an infant holds its life by what it will allow of a remitted attention even for a few hours. Who, therefore, will be surprised, after hearing under what circumstances most of these poor children were left at the hospital gates, that instead of being a protection to the living, the institution became as it were a charnel-house for the dead? It is a notorious fact, that...*
original communications, [j. 23, 1858.]

many of the infants received at the gate did not live to be carried into the wards of the building; and, from the impossibility of finding proper nurses in time, a great number of these were not enroled to the hospital, and the cruel conduct of some of those to whom they were commended (notwithstanding these people were under the superintendence of certain licensed nurses of charity), the deaths amongst them were so frequent that out of the 14,934 received, only 4,400 were equipped out, being a mortality of more than 70 per cent. (p. 175.) These children were doubtless deprived of breast milk. To attribute their death, however, tothis cause, would be manifestly unjust.

3. Influence of Season. The mortality of children is usually believed to be greater in winter than at other seasons, because the weather is so much colder. The Abbé Gaillard pointed out this contingency in the case of the Foundling Institution at X. Thus, in November and December 1829, out of 163 children, there were 112 deaths in the first 24 hours. The same is the case in this institution, whereas, in July and August of the same year, there died only 11 out of 25 admitted. We all know, also, from the Registrar-General's return, how the mortality is increased by a cold spell, the very word "frost" being a baneful influence. The conclusion, however, which I am bound to come to is, that, in public institutions, the greater number of deaths take place in spring, the least in autumn. It appears that, which is the deaths being 100 in all seasons, 30% will take place in spring; in summer and winter, it will be about the same—27%; while in autumn it will be less, only 14.3. The effect may be somewhat varied out of public institutions; but in these, extending over a period of ten years, the results must be admitted as true.

**Mortality in Ireland from June 6th, 1841, to March 30th, 1851, in Public Institutions.**

<table>
<thead>
<tr>
<th>Per Cent.</th>
<th>Spring</th>
<th>Summer</th>
<th>Autumn</th>
<th>Winter</th>
<th>All Seasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>One month and under</td>
<td>15,106</td>
<td>13,128</td>
<td>13,506</td>
<td>7,009</td>
<td>45,569</td>
</tr>
<tr>
<td>Two months</td>
<td>10,164</td>
<td>9,143</td>
<td>9,409</td>
<td>4,906</td>
<td>33,520</td>
</tr>
<tr>
<td>Three months</td>
<td>6,719</td>
<td>6,010</td>
<td>6,097</td>
<td>3,310</td>
<td>20,526</td>
</tr>
<tr>
<td>Four months</td>
<td>2,163</td>
<td>2,187</td>
<td>2,219</td>
<td>1,032</td>
<td>7,581</td>
</tr>
<tr>
<td>Five months</td>
<td>1,300</td>
<td>1,174</td>
<td>1,349</td>
<td>738</td>
<td>4,951</td>
</tr>
<tr>
<td>Six months</td>
<td>665</td>
<td>685</td>
<td>657</td>
<td>302</td>
<td>1,569</td>
</tr>
<tr>
<td>Seven months</td>
<td>368</td>
<td>392</td>
<td>374</td>
<td>189</td>
<td>923</td>
</tr>
<tr>
<td>Eight months</td>
<td>368</td>
<td>368</td>
<td>374</td>
<td>189</td>
<td>923</td>
</tr>
<tr>
<td>Nine months</td>
<td>481</td>
<td>418</td>
<td>418</td>
<td>207</td>
<td>1,229</td>
</tr>
<tr>
<td>Ten months</td>
<td>1,354</td>
<td>1,424</td>
<td>1,424</td>
<td>777</td>
<td>5,509</td>
</tr>
<tr>
<td>Eleven months</td>
<td>1,346</td>
<td>1,108</td>
<td>1,073</td>
<td>614</td>
<td>3,933</td>
</tr>
<tr>
<td>One year</td>
<td>25,716</td>
<td>22,484</td>
<td>21,848</td>
<td>10,986</td>
<td>60,920</td>
</tr>
<tr>
<td>Two years</td>
<td>23,750</td>
<td>18,638</td>
<td>18,115</td>
<td>9,247</td>
<td>47,334</td>
</tr>
<tr>
<td>Three years</td>
<td>13,375</td>
<td>13,500</td>
<td>12,558</td>
<td>6,074</td>
<td>36,516</td>
</tr>
<tr>
<td>Four years</td>
<td>8,988</td>
<td>9,739</td>
<td>9,739</td>
<td>4,722</td>
<td>24,186</td>
</tr>
<tr>
<td>Five to ten years</td>
<td>4,101</td>
<td>3,605</td>
<td>2,967</td>
<td>1,593</td>
<td>10,605</td>
</tr>
<tr>
<td>Mean</td>
<td>11,646</td>
<td>10,378</td>
<td>10,140</td>
<td>5,408</td>
<td>32,026</td>
</tr>
</tbody>
</table>

4. Influence of the Recumbent Position and Want of Exercise. In the Union Medical, November 2nd and 23rd, 1852, are two very able papers by M. Hervieux, on the abuse of the horizontal position at the Hospices des Enfants Trouvés, and its influence on the mortality of the newly born infants. The following is an abstract.

The nursery of this hospital is sixty feet long by twenty wide, and from twenty to twenty-five feet high. Light is introduced by eight windows, besides a painted one. The temperature is kept up by a large fire in the centre, around which persons can sit at ease, besides two large stoves at each extremity; so that the heat is equally diffused. Dry oak boards, covered by carpets, constitute the flooring; and the walls are always kept dry.

The linen is very clean and white; altogether, everything that could be desired, in the way of neatness and cleanliness, is carried into effect.

In this room are eighty-four cots to receive infants. Nine women are engaged in feeding and cleaning these little creatures, which is done four times a day, 6 a.m., 9 a.m., 12, and 4 p.m. The food is given in the spoon. Besides these nine day nurses, there are two night nurses employed in the same way all night. Thus, including the most restless and the quietest children together, it may be assumed, on an average, that each child is taken up six times a day. To clean and feed a child would occupy about twenty-five minutes in the hands of inexperienced nurses, ten or fifteen in the hands of those more experienced. Thus, the children, on an average, are held twenty minutes—6 × 20 = 120; so that each child has only two out of twenty-four hours exercise or movement.

Now, what is the effect of this? A child, under natural circumstances, even if fed, generally lies upon the bosom of its mother; here he obtains artificial heat; and, in the hands of others, through the shaking, petting, etc., he obtains ample exercise. Thus his heat is maintained. But, short of this exercise, the temperature of the child's body will fall, the extremities will cool; the circulation becomes slower; the respiration will be embarrassed; all the major functions will fail; the cellular tissue will harden; the visceral organs will become congealed; some will die by "sclerema," others by passive

pneumonia (which is, after all, only proof of congestion of the lungs), some of serous effusion or hemorrhage in head or spinal cord. These are simply the results of cold superadded to those of starvation.

Now, in order to prove that these children are starved, M. Hervieux proceeds to speak against the system of feeding infants only at regular hours. Looking at the case of many infants who keep sucking thirty to forty times a day, very often kept constantly to the breast, M. Natalis Guilhot and many other persons have testified, that children have a natural fibrous absorpt in the twenty-four hours from 491 to 604 oz. Such children thrive wonderfully; and hence to stint and feed a child so precisely by rule—a child who, in the earlier two or three years of life, gains half its weight he will acquire in all his life, is little less than absurd.

This large amount of food has been objected to, as giving rise to gastritis and derangement; but if no such diseases should be found in towns, among the rich and cleanliness, is carried into effect.

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population, and irrespective of founding institutions alto-
gether. I have selected the Registrar-General's tables for
London. In the quarterly returns, however, under this head,
we are referred to cold, atrophy, and privation, as, no doubt,
under these heads many cases are included which, properly
speaking, should be returned under the head of death from
want of breast-milk. Perhaps we should include some other
terms as, for instance, diarrhoea; albeit I make no doubt, that
diarrhoea may have been present in most of these cases, as a
symptom, death has been referred to the desire want of breast-
milk. This is, however, only a supposition; and hence, in
the impossibility to measure the amount due to diarrhoea, I am
obliged to neglect it. I have, however, to make amends, in-
cluded various cases of premature death and debility under
one year old, which is a large number, and which must needs
include many who are not thriving under the poor breast-milk
given, or the food afforded there. Taking the six years, 1849 to
1854 inclusive, I have the following table:

Mortality of Infants from various causes.

<table>
<thead>
<tr>
<th></th>
<th>1849</th>
<th>1850</th>
<th>1851</th>
<th>1852</th>
<th>1853</th>
<th>1854</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>From all cases under one year old</td>
<td>12,096</td>
<td>10,349</td>
<td>11,631</td>
<td>12,272</td>
<td>12,981</td>
<td>13,896</td>
<td>73,227</td>
</tr>
<tr>
<td>Privation</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Cold</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Want</td>
<td>174</td>
<td>178</td>
<td>220</td>
<td>240</td>
<td>255</td>
<td>337</td>
<td>1,413</td>
</tr>
<tr>
<td>Neglect</td>
<td>8</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premature birth and debility under one year old</td>
<td>1,322</td>
<td>1,241</td>
<td>1,475</td>
<td>1,537</td>
<td>1,475</td>
<td>1,016</td>
<td>8,173</td>
</tr>
<tr>
<td>Atrophy, ditto</td>
<td>87</td>
<td>75</td>
<td>78</td>
<td>84</td>
<td>97</td>
<td>101</td>
<td>500</td>
</tr>
<tr>
<td>Total</td>
<td>22,998</td>
<td>21,383</td>
<td>24,381</td>
<td>26,260</td>
<td>27,175</td>
<td>29,032</td>
<td>129,411</td>
</tr>
<tr>
<td>All births</td>
<td>27,012</td>
<td>24,700</td>
<td>25,058</td>
<td>26,260</td>
<td>24,254</td>
<td>24,880</td>
<td>137,685</td>
</tr>
</tbody>
</table>

Therefore, out of 473,880 births in six years, 15,244, or 3.2 per cent., died from want of breast-milk in its widest sense; or, out of 73,227 deaths from all causes, occurring to children under one year old, 30.8 per cent. might be referred to depriva-
tion of this kind of diet.

My own experience completely bears out these conclusions. I am connected with two institutions which, each in their way, have satisfied me that the congregation of foundlings or children whom we sought to bring up by hand in this town was almost uniformly poor; and that their distress, even at the present circumstances of poverty, was almost always less injurious, their salvation.

An attempt was made in connexion with one of these—an infan-
tary, where children are received during the day, in the
absence of their working parents, cared for, and fed—to take in
boarders, that is to say, the infants of mothers who were en-
aged as wet nurses. A large nursery, well aired, scrupulously
clean, temperature uniform, 70—80°, in which an experi-
enced nurse, directing four or five young women in the arrange-
ment of the children, was placed was selected. The most
approved system of diet was enforced; and yet none of these
children thrive. The mortality was certainly 4 out of 5, if not
more. The diseases that prevailed were diarrhoea, which re-
sisted all treatment, the post mortem appearances in such cases
being usually null, or consisting of a simple thickening of Peyer's
glands, similar to what we see among some cases of Asiatic cholera; apthas or diphtheritic, with or without diarrhoea. In
these cases, solution of nitrate of silver, in minute doses, or as
a lotion to the mouth, was the only remedy which seemed
ever to do good. This disease was fearfully contagious, and no
measures of precaution could prevent its extension: indeed, to
such a degree it was so, that, on one occasion, two of the big
girls, or nursemaids, who lived with a kind of obliquity in the
conjunctiva, having much the appearance of serofulous oph-
thalmia, only the ulcers were more lengthened, and there was
no photophobia. These cases did not recover till after the ap-
pearance of discharges. Children of both sexes were largely used in the rooms; the whole walls were washed with a
solution of it. The same spoon was never used to another child, and always washed after use in a solution of chloride of lime.

A separate nipple was kept for each child. Still the disease often recurred, and proved equally fatal. On this account, it often succeeded the cases of diphtheritis which recovered. Sometimes, however, it was only the symp-
tom present. These children ate enormously, but got thinner and thinner, with all the while dying away. Usually, a removal from the institution led to a recovery; except, however, in those cases of atrophy. This dis-
ease, once induced, generally persisted, and proved fatal.

The other institution was a penitentiary for females of a better class, but who, having fallen once, were taken in to be
confined and reclaimed. Many of these went out as wet nurses. Some of the infants came to the nursery before they were brought up by the hands, by friends of the
patients. Among the latter I did not trace one case of death. Although this statement should be taken with reserva-
tion, as, after some months, the children were lost sight of, and thro' the doubt that has been raised.

These are a few of the reflections which I have ventured to commit to paper, which, I hope, may prove of interest to the
society, and tend to encourage their exertions. I had hoped to
have entered upon the subject of the effect of diet on the mor-
tality of children, and foundlings in particular. The length,
however, to which this paper has already extended, precludes
this. On a future occasion, if the Society will allow me, I
shall return to the subject. I think, however, enough has been said to show that, however injurious the want of breast-milk
may be, it is somewhat exaggerated, more especially taking
in connexion the fact observed by M. Benaoust de Chateau-
net, that the mere substitution of a hired wet nurse for a mother
increases, as before seen, the mortality 10.64 per cent.

To recapitulate, therefore, I had been induced to

1. That, for the ages one year and under five, the mor-
tality, even under ordinary circumstances, is in towns nearly
double what it is in country: but this difference in the mor-
tality is accounted for by the want of breast-milk in our towns;
and therefore, as far as regards external circumstances of
life, should be, and perhaps is, but a single cause of
foundlings: therefore, foundlings should never be main-
tained in towns.

2. That in Ireland, while it is doubtless very high in the first
month, for those under one year it is only 30 per cent., in
towns, to 22 per cent. in country; the worst mortality with
foundlings being 50 per cent.

3. That travelling in fair seasons is not dangerous to
foundlings.

4. That the mortality is greatest in spring, and least in au-

tumn, with children in public institutions.

5. That a chief cause in the mortality of foundlings is want
of exercise, and the abuse of the receptive position.

6. That want of breast-milk will only account for a mortality
of 3.4 per cent. additional.

7. That a depraved hospital atmosphere and certain
endemic contagious disorders are the chief cause of the mortal-
ity in foundling hospitals; from which results we are justified in
concluding—(a) That if foundling hospitals are to be maintained
at all, they should be always built in the country. (b) That
open single wards should be converted into small well
ventilated rooms, capable of containing from three to four cots,
with one nurse at least to each small ward so constructed.
(c) That, when it can be done, wet nurses should be supplied,
and preference, if possible, should be given to the children's
mothers. (d) That means should be taken to ensure the
proper exercise of the infants.

### Table showing the Mortality in Ireland from One Month to Ten Years: distinguishing the Rural and the Civic Districts:

**1850—51.** (See pp. 47 and 48.)

<table>
<thead>
<tr>
<th>Month</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>Month</th>
<th>4th</th>
<th>Month</th>
<th>5th</th>
<th>Month</th>
<th>6th</th>
<th>Month</th>
<th>7th</th>
<th>Month</th>
<th>8th</th>
<th>Month</th>
<th>9th</th>
<th>Month</th>
<th>10th</th>
<th>Month</th>
<th>11th</th>
</tr>
</thead>
</table>

#### Ulster: Rural districts.
- Population in 1851: 5972
- Deaths in 1850: 3311
- Per cent.: 15.9

#### Ulster: Civic districts.
- Population in 1851: 1003
- Deaths in 1850: 889
- Per cent.: 10.9

#### Connacht: Rural districts.
- Population in 1851: 2542
- Deaths in 1850: 103
- Per cent.: 4.4

#### Connacht: Civic districts.
- Population in 1851: 265
- Deaths in 1850: 103
- Per cent.: 3.8

#### Leinster: Rural districts.
- Population in 1851: 3268
- Deaths in 1850: 103
- Per cent.: 3.1

#### Leinster: Civic districts.
- Population in 1851: 1654
- Deaths in 1850: 551
- Per cent.: 3.2

#### Munster: Rural districts.
- Population in 1851: 3851
- Deaths in 1850: 990
- Per cent.: 24.4

#### Munster: Civic districts.
- Population in 1851: 1230
- Deaths in 1850: 435
- Per cent.: 35.6

#### All Ireland: Rural districts.
- Population in 1851: 14643
- Deaths in 1850: 3167
- Per cent.: 21.6

#### All Ireland: Civic districts.
- Population in 1851: 4212
- Deaths in 1850: 1395
- Per cent.: 33.1