

Puerperal fever, a preventible disease : a plea for the more general adoption of antiseptics in midwifery practice : an address introductory to the session of 1888-9, delivered at St. Thomas's Hospital, October 1, 1888 / by Charles J. Cullingworth.

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PUERPERAL FEVER

A PREVENTIBLE DISEASE

*A PLEA FOR THE MORE GENERAL ADOPTION OF
ANTISEPTICS IN MIDWIFERY PRACTICE*

An Address

INTRODUCTORY TO THE SESSION OF 1888-9, DELIVERED
AT ST. THOMAS'S HOSPITAL, OCTOBER 1, 1888

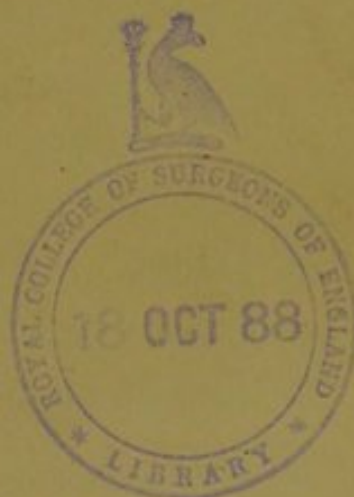
BY

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"If anything in the field of practical medicine can be taken as proved, it is that puerperal fever is a preventible disease, and the means of prevention at our disposal are both more reliable and more easily accessible than in the case of almost any other of the infectious diseases."—*Jamieson on Childbirth Mortality in the Australian Colonies.*



LONDON

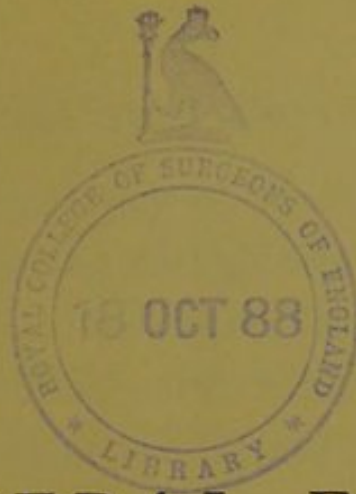
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1888

44





PUERPERAL FEVER

A PREVENTIBLE DISEASE.

THE subject I have chosen for to-day's lecture is the preventibility of puerperal fever. *

Childbirth is not uncommonly regarded as a simple physiological process, painful certainly, but, with a few rare exceptions, natural and safe. Unless your attention has been specially directed to the subject, it will probably not have occurred to you to consider how far this popular notion is correct. As a matter of fact it is very incorrect. In the latest report of the Registrar-General 3877 deaths are stated to have taken place from childbirth in England and Wales in the year 1886, including 479 in the single registration district of London.

* Much fault has been found with the term *puerperal fever*. It has, however, certain unmistakable advantages. Every one knows what is meant by it; it is comprehensive, and it involves no theory as to the nature of the disease.

The numbers for the previous year (1885) were still larger. These figures are sufficiently startling, but they do not represent the whole truth. A great many deaths from childbirth are not returned as such, but appear under entirely different headings. It often happens that a woman dies from some puerperal disease, say, from peritonitis, and on the death-certificate the name of the disease appears without any mention of its connection with childbirth. This is due, partly to carelessness, partly to the reluctance of medical men to create alarm in the public mind, and partly also to the uncertainty that occasionally arises in the mind of the medical attendant as to whether the fatal disease was attributable to childbirth or to some independent cause. The fact that many of the returns are inaccurate in the direction here indicated is well known to the authorities. Ever since the year 1881, letters of inquiry, asking for further particulars, have been issued from the office of the Registrar-General to medical men who had given certificates in which the causes of death were imperfectly stated. In one year alone, 1881, the result of sending out these letters was the discovery of 330 additional deaths due to childbirth.

This question of childbirth mortality was made

the subject of a most thorough and painstaking inquiry, some years ago, by Dr. Matthews Duncan. He arrived at the conclusion that "not fewer than 1 in every 120 women delivered at or near the full time die within the four weeks of childbed." This statement was received with astonishment and incredulity. The late Dr. Farr, of the Registrar-General's office, who had in 1856 declared the mortality of childbed in England and Wales to be 1 in 189, denounced Dr. Duncan in good round terms as an alarmist. Before his death, however, he came so nearly to accepting Dr. Duncan's estimate as to allow that 1 woman in 129 died in childbed.

TABLE I.

Registrar-General's Return of Puerperal Mortality in England and Wales for 1867 to 1869, and 1884 to 1886.

YEAR.	CHILDREN BORN ALIVE.	DEATHS FROM CHILDBIRTH.	MORTALITY PER 1000.
1867	768,349	3412 (puerp. fever 1066)	4'44
1868	786,858	3503 (puerp. fever 1096)	4'45
1869	773,381	3283 (puerp. fever 1181)	4'24
		Average .	4'37
1884	906,750	4347 (puerp. fever 2468)	4'79
1885	894,270	4449 (puerp. fever 2420)	4'98
1886	903,866	3877 (puerp. fever 2078)	4'29
		Average .	4'68

Dr. Duncan's conclusions were published in 1870. I know of no equally thorough investigation having been made since, but I see no reason to think that the mortality in this country is less now than it was then.

In the first table are shown the Registrar-General's returns (1) for the three years preceding the publication of Dr. Duncan's book, and (2) for the last three years for which the returns have been issued. The difference will be seen to be exceedingly slight. What little difference there is is in the direction of increase rather than of diminution.

So far, then, as regards childbirth mortality in general. With regard to the causes of death from childbirth, they are of course various. A considerable number of women die every year from hæmorrhage (as in placenta prævia), from puerperal convulsions, &c. But by far the majority die, not from accidental complications such as these, but from puerperal fever. The exact proportion it is at present impossible to ascertain. The most reliable statistics go to shew that puerperal fever, in one or another of its manifestations, is accountable for at least 65 to 75 per cent. of all the deaths from childbirth. In the meantime, although we know them to be far below the truth, and

utterly useless for purposes of exact investigation, we may accept the figures of the Registrar-General's Report as sufficient for our present purpose. We may at least be sure that they do not err in the direction of excess. Taking these, then, without any attempt at correction, we find that no fewer than 6966 deaths from puerperal fever have been certified as such, within the three years 1884-86, an average of 2322 cases per annum in England and Wales.

I hope, before I conclude, to succeed in convincing you that almost the whole of this mortality may in future be avoided, and that puerperal fever, both in its fatal and non-fatal manifestations, may be practically stamped out.

The nature, causes, and treatment of puerperal fever have long been a favourite theme with medical writers. More is said to have been written on this disease than on any other. Dr. Fordyce Barker found that within the comparatively short period of twenty years, 1854 to 1874, upwards of 20,000 pages had been published on the subject. The fact that scarcely anything was known about it did not in any way preclude vast numbers of men from propounding their views and theories, with a dogmatism of which a sister-profession has been erroneously supposed to have the monopoly.

In the meantime, amidst this cloud of talk, certain facts were being accumulated which were of the highest significance. Let me call your attention to a few of them.

First in importance are certain facts shewing that puerperal fever may be carried from patient to patient by medical men, midwives, and nurses. Let me give you two or three from amongst the large number of well-authenticated observations bearing on this point. I shall go a long way back for my selected examples, so as not to wound the susceptibilities of persons now living.

In the year 1795, Dr. Alex. Gordon published an account of an outbreak of puerperal fever which occurred at Aberdeen between December 1789 and March 1792. "The disease," he says, "was not peculiar to any particular constitution or temperament, but promiscuously seized women of all constitutions and temperaments; for the strong and the weak, the robust and the delicate, the old and the young, the married and the single, those who had easy and those who had difficult labours, were all equally and indiscriminately affected. It prevailed principally among the lower classes of women, and on account of my public office and extensive practice in midwifery, most of the cases came under my care. But women in the

higher walks of life were not exempted, when they happened to be delivered by a midwife or physician who had previously attended any patients labouring under the disease." He gives a table of 77 cases that came under his own care. The midwife who delivered case 1, carried the infection to the next woman whom she delivered. The physician who attended cases 1 and 2 carried the infection to cases 5 and 6, and to many others. The midwife who delivered case 3 carried the infection to case 4, from case 24 to cases 25, 26, and, successively, to every woman whom she delivered. The same thing was true in many other instances. "It is a disagreeable declaration," he continues, "for me to mention that I myself was the means of carrying the infection to a great number of women." "I arrived," he says in another place, "at that certainty in the matter that I could venture to foretell what women would be affected with the disease, upon hearing by what midwife they were to be delivered, or by what nurse they were to be attended, during their lying-in; and almost in every instance my prediction was verified."

Not less striking is the evidence of Mr. Roberton of Manchester, with regard to an incident that occurred in the maternity department of St. Mary's Hospital, in that city, in the year 1830. I will give the circumstances in Mr. Roberton's own words:—

“Mrs. A. B——, a midwife in great practice among the patients of the Charity, had, on the 4th of December 1830, delivered a poor woman who soon died with symptoms of puerperal fever. From this date to the 4th of January inclusive—exactly one month—this midwife delivered thirty women residing in different parts of an extensive suburb, of which number sixteen caught the disease, and all of them ultimately died. These were the only cases of puerperal fever which had recently occurred in connection with the Charity. The midwives, commonly twenty-five in number, then delivered on an average about 90 women per week, or nearly 380 in a month. Now, of this number delivered during the month in question, none had puerperal fever except the patients of Mrs. A. B. Yet all the time this woman was crossing the other midwives in every direction, scores of the patients of the Charity being delivered by them in the very same quarters where her cases of fever were happening.”

In describing an outbreak at Plymouth, in 1831, Mr. Blackmore says: “Case 1 of my series was the second of eight or more cases of puerperal fever that occurred in the practice of one accoucheur within a fortnight; during the next fortnight he had seven more cases, which all ended fatally; in the week

following at least three women delivered by him took the fever, of whom two died; and several cases occurred in his practice subsequently. I make out that in the practice of this medical man at least eighteen cases of puerperal fever occurred in rapid succession, most of them at a time when all the other practitioners of the town had not met with a single case of the disease."

Instances of a similar kind might be multiplied almost indefinitely. But I must pass on to speak of another fact which was continually receiving confirmation—namely, that the disease may be carried to lying-in women from the post-mortem room.

The late Sir James Simpson related that, "in the winter of 1836-37, Dr. Sidey had five or six fatal cases of puerperal fever in his practice in rapid succession, no other practitioner in Edinburgh having had any." Simpson attended the examination of the body in two of the cases, and took the diseased parts into his hands, so as to examine them more closely. The next four women delivered by himself took puerperal fever, and these were the first cases of the disease that he had ever had in his private practice. A practitioner in Leith, who examined a piece of the uterus which Simpson brought home with him, had three cases of puerperal fever directly after.

The most striking piece of evidence on this point,

however, came from Vienna. The story is one that ought never to be forgotten. I will epitomize it, as briefly as possible, from an admirable paper by Dr. Duka in the *Lancet*, July 31 and Aug. 7, 1886, which I recommend you all to read.

In the early part of 1846, a young Hungarian, named Ignatius P. Semmelweis, was appointed assistant to Prof. Klein, the head of the maternity department in the General Hospital at Vienna. For some years previously, the mortality from puerperal fever in that hospital had been excessive. The death-rate, which, during the first 39 years of its existence, was only $12\frac{1}{2}$ per 1000 (879 deaths out of 71,395 admissions), rose to 50, and sometimes to more than 70 per 1000. A peculiar feature of this increase in the mortality was that it was most marked in that portion of the department where the students received their instruction, while in Dr. Bartsch's clinique, in which instruction was given exclusively to midwives, the increase was comparatively slight. During the six years 1841-46, the mortality per 1000 in the students' clinique was 92; in that of the midwives 33.8. The Government issued one commission of inquiry after another, but no satisfactory explanation of this difference was forthcoming. Atmospheric influences were clearly not the cause, and as to overcrowding, Prof. Klein's clinique was

the less crowded of the two. It was said that things would be changed if the number of foreign students was diminished; accordingly half of them were sent away, and yet the death-rate remained unaffected. The bell that rang outside young Semmelweis's door every time the priest came to administer the last sacrament to the dying filled him with horror, and roused in him a strong determination to find out the cause of this fearful mortality. He noticed that women who were delivered before arriving at the hospital—and such instances occurred to the number of a hundred—almost all escaped. He further noticed that nearly every case of protracted labour in Prof. Klein's clinique terminated fatally, while in the No. 2 clinique, the duration of labour made no difference. At last, the light dawned upon him. A friend died from the effects of a dissection wound. The symptoms of his friend's illness were identical with those continually observed in the puerperal fever cases under his care. Here then was the clue. In clinique No. 2 the patients were attended entirely by midwives, who had nothing to do with dissections and post-mortem examinations. In clinique No. 1 the women were delivered by the students. A great impetus had of late been given to the study of anatomy and pathology in Vienna, and the students were diligent in their attendance in the dissecting

and post-mortem rooms. All they did in the way of purifying themselves was to wash their hands with soap and water. It became clear to Semmelweis that the poor women in No. 1 clinique lost their lives from the same cause as his friend, Prof. Kolletschka. In May 1847 he gave orders that, in the clinique No. 1, every person should, before proceeding to examine any patient, wash his hands in liquid chlorine or chlorinated lime-water. The mortality at once fell. By the following November and December it had fallen to 30 per 1000, and in the second year of the experiment the mortality was reduced to $12\frac{1}{2}$ per 1000, a lower rate than prevailed even in clinique No. 2. In the enunciation of his views, Semmelweis evoked the most bitter opposition. His life henceforth was one continued struggle. An object of dislike and ridicule, he became despondent and irritable, until at last his mind gave way under the strain. But in the meantime he had accomplished a great work, not only, as Hirsch says, for the Vienna Hospital, but for mankind at large, and he has left behind him a name that obstetricians, and surgeons too, should ever delight to honour.

The discovery, some years later, of the active part played by micro-organisms in the production of septicæmia furnished the key to the whole situation. Everything was accounted for. The propagation by

personal contact, the manner in which the disease dogged the footsteps of individual practitioners, and became the scourge of lying-in hospitals, the fatal results of cadaveric contamination, the deleterious influence of protracted labour, involving, as it did, repeated examinations, the almost entire immunity from the disease of women confined in the streets and elsewhere, in whom no examination was made, the success that attended the purification of the hands by means of chlorine, all these facts were now easily explained.

Already, in a well-known and thoughtful essay, the late Sir James Simpson had called attention to the analogies between puerperal and surgical fever, and had shown, not only how similar were the two diseases in their symptoms, and the morbid lesions they left behind them, but also how the anatomical condition of the patient is practically the same in both. Corresponding to the wound in the surgical patient, we have in the obstetrical always a wounded surface within the uterus, where the placenta was attached ; and very often, in addition to this, wounds of the cervix uteri, of the vagina, and of the perineum. The facilities for infection by morbid matters are thus as great after delivery as after a surgical operation. In each case, micro-organisms, if once brought into contact with the exposed surface, find

a ready entrance. How much the knowledge of the dependence of septicæmia on micro-organisms, and the methods of treatment founded upon it, have accomplished for surgery, I need not, in this hospital, remind you. What I desire to impress upon you to-day is, that they are capable of effecting an equally stupendous revolution in midwifery.

The old idea of puerperal fever was, that it was sometimes the result of infection from without (heterogenesis), and sometimes of infection from within (autogenesis). There is now abundant evidence to show that the disease is always due to the introduction of pathogenic micro-organisms from without. These micro-organisms may either be varieties of septic bacteria, or the common bacteria of putrefaction. The *modus operandi* differs in the two cases. The septic bacteria, finding an entrance through some wounded surface in the genital tract, make their way into the blood and tissues of the patient, and, multiplying there, become the active cause of the disease. The common bacteria of putrefaction also enter the genital tract from without, but their influence is exerted, not by becoming absorbed and distributed in the blood and tissues, but by setting up the process of putrefaction in any débris,—whether of placenta, membrane or blood-clot—that happen to be retained in the uterus or vagina. Such

débris may be present and may excite hæmorrhage, but unless bacteria obtain access to them, they cannot undergo putrefaction, the presence of bacteria being essential to that process. When they do obtain access and putrefaction is set up, certain poisonous chemical products are given off, which, if absorbed into the system, are capable of giving rise to puerperal fever.

The great difference between puerperal fever caused by septic bacteria and that caused by putrefaction is, that whereas in the former there is a living, self-multiplying poison in the system which, once introduced, must run its course (there being no antidote as yet known to us except such as would at the same time destroy the life of the patient); in the latter, the poison, though capable, if left to itself, of producing deadly results, is, if the source of the poison be removed, and its absorption arrested, quickly eliminated from the system, with entire relief to the dangerous symptoms.

Fortunately, the same means that prevent the one form of puerperal fever prevent the other, what is required in both cases being that no micro-organisms shall be allowed entrance to the genital tract either during, or immediately after, the process of parturition.

It is not possible, so far as I know, absolutely to

distinguish at the bedside that form of puerperal fever caused by septic micro-organisms from that caused by the products of putrefaction. The first rule of treatment, therefore, when symptoms of puerperal fever shew themselves, is to make sure once for all that the uterus and vagina are perfectly empty and clean. If the case be one of putrid intoxication (sapræmia, as Dr. Matthews Duncan calls it), the symptoms, after the thorough cleansing of these two cavities, will at once subside; if not, no harm will have been done.

The circumstance that the retention of *débris* in the genital passages is an essential factor in the production of puerperal fever due to putrid intoxication, has unfortunately led to this form of the disease being described as autogenetic. Nothing could be more misleading. "To admit," says Fritsch, "the existence of a spontaneous infection is to take a long step backward." Not only so, it is to paralyze effort and destroy hope. "The doctrine of autogenesis," exclaims Parvin,* "is a confession of ignorance, the creed of fatalism, the cry of despair," "the very pessimism of obstetric medicine." I hope to-day, to contribute in some degree to the overthrow of a doctrine which has caused incalculable mischief.

* Parvin (T.), "The Science and Art of Obstetrics," Edin. 1887, p. 563.

And now let me bring before you some of the results of the employment of antiseptics in midwifery. The obstetricians have been slower than the surgeons to profit by the teachings of Lister, and even now I am ashamed to say that British obstetricians are far behind their continental brethren in this matter.

Let me take, first of all, the experience of the great lying-in hospital at Vienna, the largest institution of the kind in the world. I have already recounted to

TABLE II.

Imperial Lying-in-Hospital, Vienna.

DATE.	DELIVERIES.	DEATHS.	MORTALITY PER 1000.
1857-62	25,123	722	28
1863-80	68,770	1117	16
1881-85	15,070	106	7

<i>Mortality from Puerperal Fever.</i>							
DATE.							RATE PER 1000.
1863-80	.	.	.	.	.	.	11/3
1881-85.	.	.	.	.	.	.	4

you one interesting episode in its history. In a paper recently published, Prof. Braun von Fernwald has given us a statistical statement commencing with the year 1857—when he took charge of the clinique. The account covers a period of twenty-

nine years. During this time, there were 108,889 births in the hospital. In the first six years (1857-62), the mortality was 28 per 1000. A number of hygienic improvements were then carried out, and the heating and ventilating apparatus was reconstructed. The consequence of these measures was a reduction of the mortality, during the next eighteen years (1863-80), to 16 per 1000, the deaths from puerperal fever being at the rate of 13 per 1000.

Then came the introduction of antiseptics, and during the next five years (1881-85) the total mortality fell to 7 per 1000, and the mortality from puerperal fever to 4 per 1000. It is worthy of note that, during the twenty-nine years in question, no fewer than 7964 students attended the clinique. It should also be remembered that, in a hospital of this kind, there is a large percentage of dangerous and difficult cases. In proof of this I may point out that, during the five years 1881-85, amongst 15,070 deliveries, the number of operations was 2543, including 9 Cæsarian sections. These facts serve only to increase our admiration at the marvellous results obtained.

I have spoken first of the Vienna Hospital, because its statistics deal with such large numbers as to have on that account a special value. Passing on now to Dresden, you will find the results there even more remarkable. Prof. Leopold has pub-

lished an elaborate and most interesting record of the cases under his care in the Dresden clinique up to the end of last year (1887). The following table shows the number of deaths and rate of mortality from septicæmia (originating in the hospital) during the past four years:—

TABLE III.
Dresden. (Leopold.)

DATE.	DELIVERIES.	DEATHS FROM PUERPERAL FEVER ORIGINATING IN HOSPITAL.	MORTALITY PER 1000 FROM PUERPERAL FEVER.
1883	1368	12	8·7
1885	1365		1·4
1886	1387	2	1·4
1887	1388	1	0·7

The *total* mortality in the year 1872 had been 50 per 1000, that in the years 1886–7 was 10 per 1000, 14 deaths having occurred in each of the two years.*

* This seems to give an unusually large proportion of deaths due to other causes than puerperal fever. It may, therefore, be well to mention the actual causes of death. In 1886, six women died from eclampsia, two from severe nephritis and uræmia, one from acute pneumonia (ill on admission), one from exhaustion after decapitation of the child for impacted shoulder, one (a case of angular curvature) from intense dyspnœa, and one committed suicide. In 1887, two women died from eclampsia, four from placenta prævia, one from granular kidney, one from intestinal perforation, one from acute meningitis following ear disease, one from rupture of the uterus, one from septic peritonitis (present on admission), and two from exhaustion. Of the two cases that died from exhaustion, one came into the hospital with her genital organs bruised, torn and bloodless, after repeated attempts at turning, and the other was a case of impacted breech, admitted after having been five days in labour.

The observation I made when speaking of the Vienna Hospital, as to the large proportion of difficult and dangerous cases, holds good also with regard to the hospital at Dresden; for example, out of 2775 women delivered in the last two years, 396, or 14 per cent., required operative interference; 27 of the patients suffered from eclampsia; 23 had placenta prævia, and 224 had well-marked contraction of the pelvis. Amongst the operations performed were no fewer than 15 Cæsarian sections. To have a total mortality of only 1 per cent., under these circumstances, is surely an achievement to be proud of. But Leopold's success does not by any means end here. The salubrity

TABLE IV.

New York Maternity Hospital.

YEAR ENDING.	DELIVERIES.	TOTAL NUMBER OF DEATHS.	DEATHS FROM SEPSIS.	MORTALITY PER 1000 FROM SEPSIS.
Sept. 1883	429	34	26	60·6
Sept. 1884	505	7	3	5·9
Sept. 1885	541	4	1	1·8
Sept. 1886	463	4	1	2·1

of a lying-in hospital is to be measured not by its mortality only, but by the amount of sickness in its wards. The statistics of the Dresden Hospital shew that, of the patients confined there in 1886,

77·8 per cent. made a perfectly normal recovery, while in 1887, the number of such recoveries actually reached 95 per cent.*

TABLE V.

Boston Lying-in Hospital.

DATE.	DELIVERIES.	TOTAL NUMBER OF DEATHS.	DEATHS FROM SEPSIS.	MORTALITY PER 1000 FROM SEPSIS.
1882	288	17	16	55·5
1883	242	14	11	45·8
1884	310	6	5	16·1
1885	308	4	2	6·4
1886	373	3	0	0

Turning to the United States, it will be seen from the extremely interesting tables before you, that both New York and Boston are able to furnish similar testimony to the value of antiseptics, the improvement in their results keeping pace with improvements in their methods, until the mortality from puerperal fever at the New York Hospital has become reduced from 60 per 1000 to 2 per 1000, and at the Boston Hospital, from 55 to 0.

* By a normal recovery is here meant one during which the temperature never, even on a single occasion, exceeded 100·4° (38° Cent.).

TABLE VI.

Paris Maternité. (Tarnier.)

DATE.	MORTALITY PER 1000.
1858-69	93 = 1 in 10 $\frac{3}{4}$
1870-81	23 = 1 in 43
1882-87	11 = 1 in 91

Scarcely less striking is the record of the Maternité at Paris. From 1858 to 1869, the mortality was 93 per 1000; this, Tarnier calls the period of inertia. From 1870 to 1881, the death-rate fell, in consequence of the adoption of hygienic measures, to 23 per 1000; while in the six years, 1882 to 1887, during which antiseptic precautions were rigidly observed, the mortality was only 11 per 1000, or little more than 1 per cent.

Such instances could be multiplied almost indefinitely. I will, however, only inflict one more upon you, that of our near neighbour, the General Lying-in Hospital in York Road. Until the year 1877, this hospital was scarcely ever free from puerperal fever, and the mortality, always high, occasionally became fearful.

In 1838, of 71 women delivered, 19 died; in 1861, 14 died out of 195; and in 1877, 9 out of 63. On several occasions the hospital had to

be closed for long periods, and thousands of pounds were spent on the sanitary improvement of the building. In Oct. 1879, this institution, having been closed for two years, was re-opened, and has since been conducted on antiseptic principles, the details varying from time to time as increased knowledge and experience have dictated. Mark the result. The total mortality, which, from 1833 to 1860, averaged 30.8 per 1000, and, from 1861 to 1877, 17 per 1000, has fallen during the last 8 years to an average of 6 per 1000.

TABLE VII.

General Lying-in Hospital.

DATE.	DELIVERIES.	DEATHS.	AVERAGE MORTALITY PER 1000.
1833 to 1860	5833	180	30.8
1861 to 1877	3773	64	17
1880 to 1887	2585	16	6

Puerperal fever has been almost entirely banished. Only one death has taken place from this cause during the last three years, and it has come to be regarded as quite an unusual event for a patient's temperature during convalescence to exceed 100° F.

In the face of such results as these, it is surely

time to give up talking about an autogenetic variety of puerperal fever.

The precise character of the antiseptic measures, to which these wonderful results have been due, varied in different hospitals, and varied, too, in the same hospital from year to year. It would therefore serve no good purpose to attempt to describe them in detail. The object at which they all aimed was the same—namely, the exclusion of pathogenic micro-organisms from the genital passages. As to the best methods of effecting this object, there is, no doubt, still some difference of opinion.

The best authorities, however, are I believe quite agreed—

1. That the fundamental rule in antiseptic midwifery—the neglect of which renders all other measures futile—is to ensure perfect antiseptic cleanliness of the hands of the attendant, of any instruments or appliances that may be required, and of everything that is liable to be brought into contact with the genital passages.

2. That the most efficient antiseptic for this purpose, at present known, is corrosive sublimate.*

* It may be useful to re-state here the grounds on which corrosive sublimate is now accepted as the most reliable of all known disinfectants. In 1874, Billroth showed that septic bacteria were killed by a solution of corrosive sublimate 1 in 9,600 (*Untersuchungen über die Vegetations-*

3. That the best method of ensuring antiseptic cleanliness of the hands is to wash them thoroughly with soap and warm water, using a nailbrush vigorously, and then to rinse them carefully, again with the help of a good nailbrush, in a solution of corrosive sublimate, 1 in 1000.

4. That if the patient has been already examined without antiseptic precautions, the vagina ought to be irrigated with a germicide solution, as a preliminary proceeding.

5. That if, for the foregoing or any other reason, sublimate irrigation be employed, care should be taken to avoid any of the solution lodging in the passages, lest the patient be mercurialized.

formen von Coccobacteriaseptica." Berlin, 1874); and, in 1881, the researches of Koch, as to the relative power possessed by various reputed antiseptics in the case of the spores and bacilli of anthrax established the superiority of sublimate in a most remarkable manner. The spores of anthrax are exceedingly tenacious of life, probably surpassing in this respect any germs of micro-organisms hitherto known. A solution of carbolic acid 1 in 20 required two days to kill them, yet a momentary contact with a solution of corrosive sublimate, 1 in 5000, sufficed to destroy them immediately ("Mittheilungen aus dem kaiserlichen Gesundheitsamte." Bd. i. Berl. 1881). In Koch's experiments, however, the conditions were such that the quantity of the disinfectant in solution came into the fullest action. Where the conditions are more complicated, the solution will require to be stronger. Sufficient sublimate must be used under such circumstances to ensure that at least one part in five thousand of free sublimate shall remain in solution. In practice, this condition is found to be fulfilled by using a solution of 1 in 1000. See Moritz (S.), Corrosive Sublimate as an Antiseptic in Surgery, (Review): *Med. Chronicle*, vol. i. pp. 355 et seq. Manchester, 1884-5.

With regard to the desirability of sublimate irrigation before and after delivery, as a routine practice, opinions vary. It cannot be denied that some of the most brilliant results hitherto recorded have been obtained by those who regularly practise sublimate irrigation. But, on the other hand, there is the experience of the hospitals of New York and Boston, where the crowning success was achieved, after irrigation, as a routine practice, had been entirely abandoned. Moreover, it must not be forgotten that there are now many cases on record where sublimate irrigation has resulted in fatal mercurial poisoning. For the ordinary douching of the vagina, during the puerperal period, the simpler and non-poisonous antiseptic solutions are, in my opinion, quite as efficacious as the more powerful ones, and infinitely less dangerous. But, as a disinfectant for the hands, instruments, and other appliances, corrosive sublimate is perfectly free from danger, and, at present, stands unrivalled.

I plead, to-day, for the more general adoption of antiseptics in midwifery. The lying-in hospitals have, very properly, led the way. But although many private practitioners have taken the matter up with enthusiasm, the practice of antiseptic midwifery is, at this moment, far from being universal. There is still a notion abroad that this question of

puerperal fever is one that chiefly concerns the lying-in hospitals. It is obvious, however, that the 2078 deaths from puerperal fever, registered in England and Wales in 1886, could not all be hospital cases. As a matter of fact, nearly two-thirds of them occurred in counties where not a single lying-in hospital exists, and even as to the remaining third, the lying-in hospitals of this country are so few in number, and so comparatively small in size, that they cannot possibly be accountable for more than an inconsiderable proportion. A certain number, no doubt, occurred in the work-houses, but the immense majority took place in the patients' own homes. The only way to avoid this terrible mortality, and to avoid also the enormous amount of puerperal disease which, because it is not fatal, remains unrecorded, is for every practitioner in midwifery to recognize his personal responsibility in the matter.

The essential antiseptic measures are very simple, and their habitual employment is not by any means burdensome. A pint of corrosive sublimate solution of the proper strength (1 in 1000) can be prepared in a minute or two from a ten-grain powder, a dozen of which can be put in a little box, and carried in the pocket. In the powders supplied, by my direction, to the obstetric clerks in connection

with our own maternity department at St. Thomas's, the ten grains of corrosive sublimate are mixed with fifty grains of tartaric acid, and a grain of cochineal. The tartaric acid increases the bulk of the powder, and, what is more important, lessens the risk of a portion of the mercury being lost by precipitation, either from being formed into an insoluble albuminate, or from the alkalinity of the water, as in the case of London. The cochineal is, of course, merely a colouring agent, to prevent the solution being mistaken for anything else.

A solution of corrosive sublimate does not, like solutions of potassium permanganate, lose its antiseptic property after being once used. It is therefore usually sufficient to prepare a supply on entering the lying-in room, to renew it when the labour is over, and afterwards to prepare a fresh solution once a day. The solution should be placed in a small bowl on the washstand by the side of the wash-hand basin, and kept there ready for immediate use, from the time the first internal examination is made to the end of the puerperal week.

The best antiseptic lubricant with which we are at present acquainted, is a solution of corrosive sublimate in glycerine, 1 part to a 1000,* and this also

* Since Dr. Boxall introduced this preparation at the General Lying-in-Hospital, and had the catheters kept partially immersed in it, cystitis after the use of the catheter has been unknown.

can be easily carried about, in a suitable and well-secured bottle.

In Germany, the use of antiseptics in private midwifery practice is a matter of State regulation. You are no doubt aware that it is the custom in that country for all classes to be attended in their confinement by midwives, the doctors being summoned only in cases of difficulty or danger. Every midwife is compelled by law to carry with her a bag containing all the necessary appliances. By the kindness of Dr. Matthews Duncan I am able to shew you one of these bags. Here, in addition to the usual armament of catheter, scissors, tape, enema-syringe, &c., is all the apparatus necessary for disinfection, including the indispensable nail-brush, while, to give completeness to the arrangements, there is in every bag a book of instructions. If any midwife fails to use these things she is liable to punishment. The tendency of public opinion in this country is not in the direction of compulsory legislation in such matters. The use of antiseptics in Great Britain is, and is likely to remain, a question of individual responsibility, not of penal enactment. Surely it ought not, on that account, to be considered the less binding.

I have now stated my case. My plea has been on behalf, not of the sickly, and aged, and useless

members of the community, but of the mothers of this country, whose lives and health are of an importance quite incalculable. Tragedies such as those I have felt it my duty to relate to you are still being enacted in our midst. I know of a country town not very far from London where, within the present year, puerperal fever has singled out the patients of one of the local practitioners, exactly as it did at Plymouth and other places fifty and a hundred years ago. For six months, every patient that he attended (with the exception of two in whom labour was over before his arrival, and in whom, therefore, no examination was necessary) died of puerperal fever.

May I, in conclusion, borrow the words of one whom the whole English-speaking profession regards with affection and with pride, our venerable American confrère, Oliver Wendell Holmes, who, writing five-and-forty years ago of similar catastrophes, rose to an eloquence which even he has never surpassed? "It is," he says, "as a lesson rather than as a reproach, that I call up the memory of these irreparable errors and wrongs. No tongue can tell the heart-breaking calamity they have caused; they have closed the eyes just opened upon a new world of love and happiness; they have bowed the strength of manhood into the dust; they have cast the helplessness of

infancy into the stranger's arms, or bequeathed it, with less cruelty, the death of its dying parent. There is no tone deep enough for regret, and no voice loud enough for warning. The woman about to become a mother, or with her new-born infant upon her bosom, should be the object of trembling care and sympathy wherever she bears her tender burden, or stretches her aching limbs. The very outcast of the streets has pity upon her sister in degradation, when the seal of promised maternity is impressed upon her. The remorseless vengeance of the law, brought down upon its victim by a machinery as sure as destiny, is arrested in its fall at a word which reveals her transient claim for mercy. The solemn prayer of the liturgy singles out her sorrows from the multiplied trials of life, to plead for her in the hour of peril. God forbid that any member of the profession to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly or selfishly !”*

* Holmes (O. W.), *The Contagiousness of Puerperal Fever: New England Journ. of Medicine and Surgery*, April 1843. Reprinted in a pamphlet entitled “*Puerperal Fever, as a Private Pestilence.*” Boston, 1855. Also in “*Medical Essays,*” 1842-82. Boston, 1883.

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