Original Articles.

BIRTH- AND DEATH-RATE AS INFLUENCED BY OBSTETRIC AND GYNECIC PROGRESS.*

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THE progress of medical science has left an unquestioned impress upon the world's vital record, and we see the results clearly marked in the statistics of all civilized communities. No less decisive has been the progress of obstetric and gynecic science, and we have every reason to expect similar positive results and a similar impress upon vital statistics. But it will appear that *this is not the case;* at least not to an even approximately corresponding degree, as shown by a comparison of the results achieved: On the one hand (1) the death-rate, past and present, from certain infectious diseases; on the other (2) fecundity, number of stillbirths and death-rate in childbirth before and after introduction of modern method.

I. STATISTIC EVIDENCE OF MEDICAL PROGRESS.

This we find in fluctuations in the movements of population which are directly referable to the development of medical science, such as the control of smallpox or diphtheria and the extermination of yellow fever.

(1) *Smallpox.*— Smallpox, that foul disease which, according to Condamine,[1] at one time destroyed or disfigured one-fourth of mankind, and which was causing one-tenth of all the deaths of the human race when Jenner performed his first vaccination, is now almost eradicated. In the last decade of the eighteenth century, 32% of all deaths under ten years of age were due to smallpox, and at times, as epidemics swept over the land, these figures were frightfully exaggerated. In 1737, 70% of the inhabitants of Greenland died from the ravages of this disease, which has left its traces on this continent too, and has done more than any other cause to exterminate the American Indian: as late as 1837 the destruction of life was enormous, entire tribes being swept away by this disease.

The results of vaccination appear with the precision of a chemical experiment: from 1774 to 1801 there were 204 deaths per 100,000 population in Sweden. The very first attempt at vaccination (1892 to 1896) is marked by a reduction of this rate to 40.8; optional vaccination reduced this to 15.5 (1817 to 1884), and compulsory vaccination (1884 to 1893) brought the figures to a minimum, the death-rate being but .02 to .5, very much the same figures as those found in Prussia.

In 1874, when vaccination was made compulsory in that country, the death-rate from smallpox was 31 to 100,000 population; after that it was 1.5, and in 1896, .5. In the Prussian army, where revaccination is so strictly observed, it has practically disappeared — one death only is recorded from 1874 to 1896.

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(2) *Yellow fever.*— More striking still is the recent conquest of yellow fever,— a triumph of the most advanced methods of modern scientific medicine, preventive, protective rather than curative, which appears like one great clinical experiment, performed under our very eyes. In a very few years changes have been wrought which are usually accomplished slowly with the development of medical science in the course of the century's progress. In Cuba medieval conditions have been rudely disturbed by modern scientific methods, and the result we see in the prompt disappearance of the long-persisting scourge. For the first time in 150 years, since 1762, no death from yellow fever has been reported in the city of Havana during the usual period of its activity.

In October, 1896, the death-rate from yellow fever was still 240 per 100,000 population; in 1899 it was 29, with not a single case in 1901. Such is the showing of Major Gorgas,[2] chief sanitary officer of Cuba, of the splendid work done by General Wood in Havana. Yellow fever has been practically stamped out, and the death-rate from all diseases for November, 1901, was 19.6 per thousand population, which compares favorably with any city of the civilized world, somewhat better than Boston at the same period. These are the results in Cuba alone, but the benefits extend far beyond the limits of the island, throughout our southern states and into the Mississippi valley as far as Memphis, which has again and again been depopulated by yellow fever, which had its origin in Havana.

Such are statistical figures which mark *medical progress*, and it seems but natural that we should seek some corresponding evidence of the influence of *obstetric* and *gynecic* development upon the community at large — some evidence of the progress of that science whose object is the treatment of conditions which prevent the healthy performance of the sexual function and the relief of morbid processes which interfere with the normal progress of menstruation, of ovulation and of parturition.

II. STATISTIC EVIDENCE OF OBSTETRIC AND GYNECIC PROGRESS.

We should expect a more healthy functional activity, conception more frequent, pregnancy more normal, parturition more safe and successful for both mother and child. But the result, as shown by the record of vital statistics in *birth-rate*, number of *stillborn* and number of *deaths in childbirth*, is not what we should expect from the splendid record of gynecic science, from the brilliant operative procedures and successful methods of treatment which constantly appear.

(1) *Birth-rate.*— The tendency of gynecic progress in past decades has perhaps been hardly such as to favor a healthy functional activity of the sexual organs. The mortality from abdominal section has been reduced to 3 or 4%. Series of 100 cases without a death are so frequently reported that they have become a drug on the market, but brilliant surgery, no matter how successful, can-

not compare in benefit derived with preventive medicine; removal of uterus, of tubes and ovaries, does not favor fecundity and an increased birth-rate.

However, we now see distinct evidence of a beginning revulsion — a tendency to so-called conservative surgery, though hardly as yet to preventive and curative gynecology, but we have learned to control many conditions which were formerly beyond the resources of our art. The curette and the electrical current have proven satisfactory means of overcoming endometrial inflammation; neoplasms which obstruct the uterovaginal canal are readily removed; displacements which might interfere with conception are permanently overcome; obstructed tubes are again made patulous; fimbriated extremities are repaired; and ovulation suspended by disease of the organ is made possible by a transplantation of ovarian tissue, if need be, from another individual.

Whatever the immediate operative results, they have certainly not led to a more healthy functional activity, as statistical records demonstrate: the fecundity of woman is decreasing; the birth-rate growing steadily less in all countries, most so in the United States. As an index of conditions on the other side of the Atlantic we may note the changes which have there taken place (Table I).

TABLE I.— BIRTH-RATE.

BIRTHS REGISTERED PER 1000 POPULATION.

	1870-1874	1890-1894
Russia	50.	48.5
Austria	39.4	37.2
Prussia	37.6	36.9
England	35.3	30.3
France	25.9	22.4
UNITED STATES	—	22.1
Massachusetts, native	—	17.
Michigan, native	—	14.
Massachusetts, foreign	—	52.
Michigan, foreign	—	50.

From 1884 to 1898 the rate of childbirth in Austria has been reduced from 39.7 per thousand population to 36.2;[3] in England, from 33.6 to 29.4; in France, from 24.8 to 22.1; and this is about the condition which exists in this country — a birth-rate of 22.1 per thousand population, which has not decreased in the last few years, because it had already reached so low a state that further reduction would seem impossible; 22.1[4] per thousand population is the birth-rate found by averaging that of six states in this Union, which present the most reliable statistical records. But this rate, as low as that of France, is the total, in which we must carefully distinguish the birth-rate of the native American population, which varies from 14[4] to 17[5] per thousand, and that of the foreign population, which is usually at least two and one-half times as great, from 37 to 50 and more per thousand — that of the native less than the lowest in any European country, that of the foreigner higher almost than the highest.

To the medical man the existing conditions will be more clearly depicted by the figures which represent the fecundity per marriage, or the fertility of the individual woman. In European countries this varies between four and five children to the marriage.[3] In the United States it is a little over two,[6] and in speaking of this country I shall refer only to the native-born American woman, because it is she who exemplifies American conditions. The birth-rate of the foreign-born mother is greater immediately after immigration, under the more favorable conditions of her new home, even greater than it was in her native land, but in one generation the American standard is promptly attained.

The fecundity of the American woman is decreasing with astonishing rapidity. Benjamin Franklin[7] allows eight children to a family, one and all considered. Genealogical records[6] show it to have been fully six in the seventeenth century in the American colonies; and at the end of the eighteenth century the United States stands at the head of the list, with a fecundity of 5.2,[8] second only to New South Wales, with 5.4 children to the marriage — a fecundity such that, when considered together with that of China, it led to the Malthusian theory of superfecundation, to the fear of overpopulating the earth's surface: and now, after a lapse of only one century,— that century of the greatest obstetric and gynecic progress,— the fertility of the American woman has been so much reduced that it is but little over two children to the marriage, much like that of France. From *first* we have passed to *last* (Table II).

TABLE II.— FECUNDITY PER MARRIAGE.

DECREASE IN UNITED STATES OF NUMBER OF CHILDREN PER MARRIAGE.

Franklin's statement	8.
Genealogical records, 19th century	6.
Sadler, 1750-1780, 18th century	5.2
Salem, 1727-1784	4.5
Native American, end of 19th century	3.
Native born, 1900	2-2.7
Foreign born, 1900	4.5
European average, end of 19th century	4.5

As fecundity has decreased, sterility has increased, and throughout the entire State of Massachusetts[5] — the only State which gives such statistical figures — it is now 20% among American women,— precisely the same status which I have found in the cities of St. Louis and Boston, that is, 20% among the entire American population, slightly less among the lower, and more, 24%, among the higher classes; — throughout the State one in every five American marriage is barren. Such are the figures; * whatever the

* VALIDITY OF FIGURES PRESENTED.— The minimal birth-rate and low fecundity of the American woman is so striking that objection has again and again been made to these figures as questionable by reason of the paucity and inaccuracy of vital statistics in this country. The question is one so important and so serious that I must emphasize the validity and correctness of the figures I give. I will not here argue as to their absolute correctness to the decimal. It must suffice to show that they fairly repre-

cause, obstetric and gynecic progress show no perceptible impress.

(2) *Stillbirths.*— The status of obstetric practice may be judged, as far as the community at large is concerned, by the number of stillbirths and the number of deaths in childbirth, which, like the birth-rate, are recorded in the vital statistics of the country. Stillbirths should have decreased with the progress in the science and practice of obstetrics. The death of the child *in utero* should now be almost the only admissible cause for the birth of a dead full-term fetus, and the cause of such premature death is usually syphilis, which is under reasonable control, so that even stillbirths from this cause should be greatly reduced. The life of a fully developed, viable child should no longer be endangered during the progress of labor, unless it be in extreme cases of eclampsia or placenta previa. The use of the obstetric forceps has become so general, and both instrument and method of application have been so perfected, that rigidity of tissues or inefficiency of labor pains should no longer endanger the life of the child. Malposition should no longer be an obstacle to the birth of a living fetus, since we are enabled to rectify such irregularity by external manipulation during pregnancy, and to deliver during labor by combined version; anesthesia has facilitated all obstetric operations, and made them possible when death of the child before completion of delivery must have ensued without its use. A deformed pelvis of higher degree, and abdominal tumors which, until within the last few decades, were an inevitable indication of fetal if not maternal death, are no longer an obstacle to the birth of the living child, since the perfection of the Cæsarean section and of symphyseotomy: even extra-uterine pregnancy, if developed to full term, should add to the country's living population. In fact, enthusiastic advocates of the Cæsarean section claim that ere long the intelligent woman will give preference to childbirth by this means, as thus avoiding the pangs of labor.

Not only has obstetric science progressed, but obstetric teaching has been greatly perfected. The student is no longer obliged to gain the necessary experience after graduation in the early years of his medical career, but enters upon the duties of his profession with a practical experience, which his older confrères may well envy.

In face of these facts statistics show that stillbirths have not materially decreased. In European countries they appear to be diminishing somewhat in frequency, but this hardly seems to be the case in the United States, so far as we can judge from statistical records, which even now are far from perfect, and do not extend back over many years. From 1850 to 1860 we find that in European countries more than 4% of labors resulted in stillbirths: in Prussia, 4.2%[9] (1858 to 1867); in Sweden only do we find them less frequent, 3.3% (1861-1870) less than in other countries at the present time; recently the city of Berlin reports 3.4% (1884 to 1895), a decrease of .4% from the preceding years (1877-1888). During the same period, in the State of Rhode Island,[10] we find 3.6%, with no change from 1877; in fact, in the entire forty-six years after 1854, only 3.8% are noted. In Rhode Island the rate has remained practically unchanged, while in Prussia it is decreasing slightly. In comparing these data with those from European countries, we must remember that on the other side of the Atlantic illegitimate births are far more common than in this country, averaging about 7 or 8%,— in some regions more, in some less,— and among these stillbirths are by far more common, usually about 7%, which of course adds to the general number.

The lowest figures given are those from Berlin[11] (1884-1895), 3.4%; in the year 1898, 3.5%. In the city of Budapest, which I cite on account of the accuracy of its statistics, 3.9% are recorded in 1896. Throughout Italy, from 1894 to 1896, the frequency is somewhat greater, 4%; in the city of Rome, 6%.

I may note that it would appear from European records that in some, at least, of the great centres, stillbirths are more common than in the rural communities, possibly on account of the greater number of illegitimate labors. To this fact I desire to call attention as an indication of the utter impotency of medical science when confronted with the powerful factors for evil which actually determine the movements of population.

In the Out-Patient Department of the Lying-in Hospital of the city of New York[12] 3.6% of stillbirths occurred, all cases included, among more than 10,000 labors, in the six years previous to 1896 — practically no improvement upon the statistics of the entire State of Rhode Island for the past half-century. Among some 5,000 cases in the Out-Patient Department of the Boston Lying-in Hospital[13] during the three years from 1898 to 1901, 3% of stillbirths are reported. In the hospital itself, from 1874 to 1901, among nearly 11,000 cases, stillbirths reached 5.4%, but if we

sent existing conditions, and this, I believe, is clearly proven by the following facts:

(1) Our population is not increasing, at the present time, notwithstanding the large number added by immigration, as much as it was by birth-rate alone in the days before immigration.

(2) All figures from various sources give the same results: from the vital statistics of Michigan and of Massachusetts, from the dispensary records of Dr. Chadwick in Boston, and my own in St. Louis, and from the study of female college alumnæ by Carroll D. Wright in the East and Mary Robert Smith in the West.

(3) My own and other individual investigations are based on the report of each mother as to the number of her children, and though small compared with census numbers are certainly reliable.

(4) The figures given in the vital statistics of Michigan and Massachusetts are not the crude results of the census, but an approximation to the true birth-rate as secured for Massachusetts by Kuczynaski and for Michigan by Wilbur by a correction of the crude results by addition of such numbers as experience has shown to be necessary for the omissions in each state.

(5) In the State of Massachusetts, the question "How many children in each family" was asked in the census of 1885, so that a correct ratio was obtained even if only a portion of the population was reached.

(6) The refined and corrected birth-rate for Massachusetts gives figures which would seem rather *above* than below the true average, as that for the foreign-born element is higher than that of any European country, even higher than that of Russia.

It is simply impossible that these figures should be *below* the true numbers— if anything, they are *too high*. This should be convincing to those who are not satisfied to accept as correct, results which are practically alike for the same class of population in three different states, immaterial whether from the State census or from private investigations.

exclude those which are noted as premature, the result is a much better one, 2.5%.

To the vital statistics of many of our communities I am hardly justified in referring, by reason of their admitted imperfection. In the State of Michigan but 2.4% are recorded, and in the city of St. Louis we find the rate varying from 3.8 to 8%. In both instances, however, the investigators call attention to the uncertainty of the data, so we may well ignore these two extremes (Table III).

TABLE III.—STILLBIRTHS PER 100 BIRTHS.

	Before the antiseptic era.		Recent Records.	
Prussia	1858–1867	4.2		
Sweden	1861–1870	3.3		
Leipzig, Berlin, Hamburg, illegitimate births	1870	7.		
Berlin	1872–1888	3.8	3.4	1884–1895
Rhode Island	1872–1888	3.6	3.6	1884–1895
" "	1854–1899	3.8		
Budapest			3.9	1896
Out-Patient Dept., New York			3.6	1890–1896
" " Boston			3.	1898–1901
McLean Hospital, "			5.4	1874–1901
Infirmary, W. & C., New York			5.1	1901
Blackwell's Island, "			10.7	1901

The impress made upon the statistics of stillbirths by the advance of obstetric art is evidently but slight. Throughout Prussia there seems to be a trifling but gradually continuing decrease from 4.2% in the early '60's to 3.4% in 1895, in Berlin. At the present day we find 3.9% in Budapest, 4% in Italy, 3.6% throughout the State of Rhode Island, with hardly a change from 1854, and the same, 3.6%, at the present day, in the Out-Patient Department of the Lying-in Hospital of the city of New York; yet Sweden recorded but 3.3% from 1861-1870; 3%, the lowest figure noted, occurred in the Out-Patient Department of the Boston Lying-in Hospital, over 5% in the hospital itself; and for 1901, 5.1% in the New York Infirmary for Women and Children; 10.7% at Blackwell's Island, Metropolitan Hospital, and at the City Hospital, 6.5%.

(To be continued.)

AMAUROSIS (ATROPHY OF THE OPTIC NERVE) AND ITS TREATMENT BY THE SUBCUTANEOUS INJECTION OF STRYCHNIA.[1]

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PROBABLY no disease of the eye was more frequently met in the group classed by our predecessors under the general head of "Amaurosis" than progressive optic nerve atrophy. And although the progress of science has enabled us to give this affection its own proper name, to watch its development and, in some cases, ascertain its cause, the prognosis is hardly less gloomy and the efficacy of treatment but little more demonstrable than was the case half a century ago. The ophthalmoscope gives us an opportunity of witnessing the change, the test-types and the perimeter of noting advance, but in the matter of therapeutics we have but slight improvement to record.

The recent simultaneous occurrence of several cases of optic nerve atrophy in my own practice, and a rather unusual opportunity offered for their study and observation, has led me to look over my notes of similar cases met with during my professional life. I have thus been enabled to collect some statistics not found in the books, a recital of which, although it may add but little to our practical knowledge of the disease, will not, I trust, be without interest.

It is not often that the surgeon has an opportunity of following a fatal case to its termination. I therefore give a brief history, which may serve as a typical one.

Patient a stout, well-preserved man of 48. He had been captain of a whaler, and only recently retired from the sea. Habits temperate, health always excellent. Within a year had noted the gradual loss of the sight of left eye, vision simply growing dim and gradually almost disappearing. For six months he had observed failure of the remaining eye, and this brought him to me. His own attention had been called to the progressive contraction of the visual field, and he had just lost the power of reading. On examination the left eye, externally normal save for a somewhat dilated pupil, was found to possess only quantitative perception of light. The nerve was of chalky whiteness, veins large, arteries greatly contracted, no excavation. Vision of right eye .5, visual field much contracted upwards and inwards, nerve somewhat atrophic, but the process much less advanced than was the case in the other eye. To make the account of this case as brief as possible, the disease steadily progressed, despite all treatment. The field slowly contracted, the nerve grew whiter and whiter, central vision became more and more impaired. As the patient expressed it, "I see everything through a mist, that is gradually thickening as the field contracts." He went home, but wrote me from time to time. His health continued excellent, his strength unabated and his appetite good. Two years later he was blind. Four years afterward he was again heard from. In the interval, assisted by a competent clerk, he had continued to perform his duties as registrar of deeds in his native town. He, moreover, edited a paper, besides writing up and publishing his adventures as a whaleman. His memory continued good and his mind was never in the least affected. Several years later he died of, I think, pneumonia.

The foregoing may be taken as a representative case of the class in which blindness proceeds from this cause and the general health remains unimpaired. Such an instance is by no means infrequent. Of course many others depend on local or general disease, on excesses in living, the abuse of venery, the abuse of alcohol or tobacco. But there are many that can be classed under none of these heads.

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(3) *Death in Childbirth.*— The same progressive methods which facilitate the delivery of the child and would be expected to lessen the number of stillbirths serve to minimize the dangers of parturition for the mother, and should decrease the mortality; in addition, the introduction of aseptic practices has eliminated the greatest element of danger to the parturient women — the ever-threatening invasion of the dreaded puerperal fever. We know that hospital mortality has been reduced to almost *nil*, and in these institutions desperate cases of all kinds are concentrated, every contracted pelvis seeks their aid, patients are hurried in when in convulsions or flooding to death, and are often received in a moribund condition. In view of the splendid results which hospital statistics prove attainable, deaths should be few indeed in the community at large where the normal physiological act of parturition prevails, but as compared with the low mortality of .2 to .6% in some of the great maternities the vital statistics of our large cities present most unsatisfactory results.

Hospital death-rate.— Hospitals all clearly indicate the advent of the antiseptic era by a practical disappearance of puerperal fever and a prompt and marked decline of mortality, but this improvement has not everywhere continued, and many now show no better results than those recorded one hundred years ago.

I can but recall facts already well known, as there is absolutely nothing new to report since the admirable papers of Garrigues,[14] [15] unless it be that in some of our great American maternities the *death-rate* is *again increasing*. In the New York Maternity[14] we find a mortality of 6% in 1882, or, for a longer period, 1875-1883, 4.17%, and after the reform inaugurated by Garrigues this promptly declined to .18% throughout the ten years from 1884-1893. In the Lying-in Hospital of Boston this same high mortality prevailed in 1883, a death-rate of 6%, and in the ten preceding years, 1874-1883, as in New York, 4%; the antiseptic era was inaugurated by a decrease of the death-rate to .8%, 1884-1893. Since this time a marked increase is observable, the mortality averaging 1.3% in the next six years up to 1900. The lowest mortality is observable here, as in the New York hospitals, in the earlier years of the antiseptic era (1884-1893); best, .18% in the New York Maternity, .2 to .6% in the Clinique Baudelocque, and yet in many it is *now* .8%, and in some over 1%.

There is no doubt as to the great reduction of the hospital death-rate, even if we exclude the fearful years of epidemic invasion, because it would appear that in the period preceding the antiseptic era these institutions, which had become saturated with the deadly germ, were never free from its ravages; 4% was a frequent death-rate; not exceptional were such figures as 10% in the Vienna Lying-in wards (1841-1846), or 11% in the Paris Maternité, and during the most serious epidemics 15% and even 20% was reached. The general hospital average is best represented by the grand total of 2,000,000 confinements in public institutions collated by Le Fort,[16] which show a mortality of 3.4%.

In the previous century, strange to say, we often find conditions much more favorable and

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very good indeed as compared with results of the present day. In the Dublin Rotunda, the death-rate is only about 1% in the half-century from 1757 to 1814. In the Marion Street Lying-in Asylum of New York, in the twenty-one years from 1866 it was but 1.1%, and Goodell, under the favorable conditions of the Preston Retreat, reduces his mortality to .8%. Such favorable results were obtained in the days before the era of post-mortem study and of frequent examinations by students, or if after such time, by the avoidance of these dangers; but when compared with some of the present-day maternity records these results are certainly astonishing, and lead us to wonder why the death-rate in some of our hospitals and in the community at large has not been lowered far more by modern progress. It is now about what it was over 100 years ago (Table IV).

TABLE IV.

DEATHS IN CHILDBIRTH PER 100 BIRTHS.

A.— HOSPITAL RECORDS.

	Pre-antiseptic Period. Earlier Records. Hospital.		Antiseptic and Aseptic Period. Modern Records.	
Rotunda, Dublin	1757–1814	1.		
Copenhagen	1867–1881	.5		
Marion Street Hospital, New York	1854–1866	1.1		
Preston Retreat	—	.8		
2,000,000 births, all hosp., LeFort	—	3.		
During epidemic 8-20%	—	10.		
New York, Maternity	—	4.2	0.18	
Boston, McLean	—	4.	1.3	
Dorpat	—	—	1.5	1888–1893
Berlin	—	—	1.9	1888–1895
Wurzburg	—	—	.7	
Paris, Baudelocque	—	—	.2-.6	
New York Infirmary, Women and Children	—	—	.1	1901
Blackwell's Island, New York	—	—	2.6	1901
Flower Hospital	—	—	5.	1901

B.— COMMUNITY AT LARGE.

PRE-ANTISEPTIC PERIOD.			ASEPTIC PERIOD.		
Paris (hospital epidemic year)	1856	.26			
Paris, St. Petersburg, Edinburgh, Duncan	1860–1865	0.6–.8			
Copenhagen, stadfeldt	1850–1874	.8			
New York, Irish	1867–1875	1.1			
Baden, Hegar	1864–1866	.7			
England, county	1867	.43			
England, towns	1867	.49			
England, private practice, Duncan	—	1.			Out-Patient Depart., New York Lying-in Hosp.
New York	—	1.1	.42	1890–1898	Out-Patient Depart., Boston.
Berlin	1877–1884	.4	.5	1898–1900	
Rhode Island	—	.8	.27	1884–1894	
Michigan	—	1.7	.6	—	
			1.4	—	
			.3	1896	Budapest.

Community at Large.— Great as are the numbers involved in hospital practice, they are yet but an insignificant fraction of those confined in their homes among the population at large, as shown by the data found in the vital statistics of the entire country, and here we must find the figures by which fairly to gauge the results secured and the practical value of obstetric progress. As far back as 1856, in that year when the death-rate in the Maternité of Paris reached 5.3%, it was but .26% [16] in the twelfth district, one of the poorest of the city. Lusk [17] records a mortality of 1.1% in the city of New York, for the nine years from 1867 to 1875. Florence Nightingale [18] cites the report of the Registrar General of Great Britain (1867) to show that the mortality in childbirth in sixty-four of the healthier districts of England was but .43% and .49% in eleven large towns. Hegar [19] finds it to be .73% in healthy districts of Baden (1864-1866).

But these are scattered records, which only suffice to recall the well-known fact that the mortality in the community at large at one time was far less than that of the hospital. To observe closely the effect of obstetric progress, it will be necessary to follow the statistics of a given locality for a number of years, and these should be the years immediately before and after the general introduction of antiseptic practice. This era varies. It is earlier in one country than it is in another; earlier in the hospital than in the community at large. In Austrian hospitals this was in 1879; in those of Paris, in 1882; in Germany, throughout the community at large, in 1883; in this country in 1884, and here it appeared at the same time in the hospital records and in the vital statistics of the community.

In the city of Berlin,[11] the death-rate in childbirth from 1877 to 1888 was .4%, and from 1884 to 1895, it was reduced to .27%. The figures for the corresponding period in the State of Rhode Island are .67% and .51%, a reduction at the same time but not so marked, and the death-rate higher in both periods than in the Prussian capital. In the State of Michigan, from 1875 to 1884, it was 1.7%, and from 1885 to 1894 1.4% — a distinct reduction in each case.

I will say that other of the large cities of Europe show about the same percentage as Berlin, which gave an average of .27% for recent years; in 1898, .29%, almost the same as Budapest,[20] .3%. This, moreover, corresponds well with the English data given, although Lusk's observation in the city of New York shows 1% (1867-1875), Matthews Duncan [21] records Paris (1862) with .63%, St. Petersburg .68%, Edinburgh .64%, and calculates the actual results by correction for the invariable omissions, to be respectively .83%, .9% and .82%, and Stadfeldt [22] finds a death-rate of .8% in Copenhagen for the twenty-five years from 1850 to 1874.

* These figures cannot be looked upon as absolutely correct, by reason of the great variety of classification. Many of the deaths in childbirth are concealed under other headings such as "convulsions," pelvic inflammation," "peritonitis," "albuminuria," and others; yet I take them to be relatively correct and indicative, as the same proportion will probably escape proper classification year after year, and the results given serve well for purposes of comparison. The figures of Lusk and Garrigues are carefully compiled and I also have endeavored as far as possible to verify the figures given under deaths in childbirth by comparison with all found under separate classification such as puerperal fever, puerperal eclampsia, puerperal sequences, rupture of uterus, extra-uterine pregnancy, uremia, etc.

If we consider these figures, between .6% and .8%, during the preantiseptic era and the more recent ones of Berlin, of Budapest and of Rhode Island, for the modern era, .3 to .6%, we cannot help but look upon the mortality as excessive and unduly high when compared with modern progress and with the modern maternity with desperate cases of all kinds, and its mortality of from .2 to .6%.

The lying-in hospital is the haven of refuge for all who are in danger at the time, who have once experienced difficult labor, or have any fear of complications, yet, with all the life-endangering conditions and the serious operations necessitated, the death-rate is below that of the community at large; let me add, in *most* hospitals, *not in all* by any means.

Private practice.— Some slight progress is evident in vital statistics of cities and countries, a slight decrease in the death-rate, due to a lessening of the cases reported as puerperal fever or puerperal sepsis. In private practice mortality is about the same, but higher than it is in the best-managed hospitals, much as it was in preantiseptic days. The only records of private practice I can recall are those of Matthews Duncan and McClintock,— 16,108 cases with a mortality of .75%,— while the private practice of Duncan himself shows the higher mortality of 1.08%. As Garrigues says: "Leaving out the exceptional results of prominent obstetricians with a wealthy clientele, the mortality in private practice is about 1%." This is likewise unduly high, and not at all in keeping with the results of the best lying-in hospitals. In the Out-Patient Department of the Lying-in Hospital, where exceptional care is given the parturient, and where we have practically an average class of cases, the mortality is fully equal to, if not greater than, that of the best hospitals, where a far greater number of difficult confinements occur, and it is no better than in the community at large. In 10,000 cases of the Out-Patient Department of the Lying-in Hospital of the city of New York, a mortality of .4% is recorded, and among 5,040 cases of the corresponding department of the Boston Lying-in Hospital, from 1898 to 1901, the mortality is .3%, really .5%, if we include, as must be done, the more serious cases which were sent to hospitals for the completion of labor.

Résumé.— Practically the mortality of the Dublin Rotunda throughout an entire half-century to 1814 is even now exceeded by some hospitals: Boston, 1.3% (1894-1900); Berlin, 1.9% (1885-1895); Dorpat, 1.5% (1888-1893). As a rule it is less, .6% or thereabouts; in many as low as .2%, but then, we must remember that the Copenhagen Maternity, even in pre-antiseptic days, yielded similar results, varying in 1867-1881 from .3 to .6%, once only attaining as high a figure as 1.1%. The death-rate throughout the city of New York was 1.1% in pre-antiseptic years, and is that given by Duncan for private practice. During the same period less than 1% (.6 to .8%) is reported for the great cities of Europe, less than .5% for country districts and many towns of England — practically the figures observed in Berlin at that time, .4%; since then, with the advent of antiseptic practices, it has decreased to .3%,— as it is now also in Budapest. In this country the mortality is higher, higher than it was in England or in Prussia under the old régime: in the State of Rhode Island, .7% before 1884, .5% since, and now 1.4% in Michigan. Mortality in childbirth in the community at large has decreased with the antiseptic era, but not to the extent we should expect from the low death-rate of some maternities, which should serve as a standard as to what *can* be accomplished with the means now at our command: with this standard of .2 to .8%, and the great number of desperate cases included in view, we should expect a much lower mortality in the community at large.

Progress is evident; puerperal fever has been banished from the hospital, and yet when we compare the results of the Copenhagen and Dublin institutions, .5 and 1%, with the Boston, Berlin and other hospitals at the present day, with 1.3 and 1.9%, the facts are confusing and correct deductions difficult. Large numbers only are conclusive, and the total hospital mortality of the present is probably nearer 1%, while that of forty years ago was 3%.

CONCLUSION.

A careful review of the figures here presented clearly shows that obstetric and gynecic progress has left no distinct impress upon the record of vital statistics comparable to the decreasing death-rate and the control of epidemics which mark the development of medical science. The birth-rate, the fecundity of woman, has not increased, it has decreased; stillbirth is decreasing to some extent in Europe, very little in this country; the death-rate in childbirth has been reduced somewhat by the introduction of antiseptic practice, less in this country than in Europe, notwithstanding the still prevailing supremacy of the midwife abroad. But on both sides of the Atlantic it is still greater by far than it should be, greater by far than it is in many maternities, where desperate cases of all kinds are concentrated. In hospitals the results of modern practice stand clearly revealed, but the splendid record made in the early years of the antiseptic era is not everywhere maintained, and in some of the leading maternities of this country the death-rate is again increasing.

Vital statistics show that in the community at large the effect of antiseptic precaution is distinctly marked, but by a very trifling decrease only in the death-rate, more especially by a diminution in the deaths from puerperal fever; those from eclampsia are more frequent. The death-rate in the community, the death-rate in private practice, which in the light of modern scientific medicine should be an inappreciable figure, is still greater than that of most maternities. All in all, mortality in childbirth shows with some distinctness the evidence of obstetric progress,

but the number of stillbirths and the birth-rate show fluctuations which are controlled by contrary factors, totally different in character, and completely obscuring the influence of medical science.

In the high death-rate of the child in illegitimate labor, the results of criminal interference appear distinctly evident. In decreasing fecundity we see the deteriorating influences of refinement, of the higher civilization, of luxury and of social aspirations,—all in part accountable for the low birth-rate. But, whatever the motive, the distinct cause of diminishing fecundity is the intentional limitation of the family, the determination not to be troubled with children at all, or only in such numbers as are deemed appropriate by husband and wife to their comfort, to their social and financial status. In the unequal contest, medical science yields to human vanity and desires and its influence is completely effaced so far as the population at large is concerned. Only in the somewhat lessening death-rate of child-bearing women and in the sporadic decrease of stillbirth do we see an evidence of its progress.

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THE OBSTETRICAL SOCIETY OF BOSTON.

MALCOLM STORER, M.D., SECRETARY.

MEETING of Jan. 21, 1902, DR. J. B. SWIFT in the chair.

DR. G. J. ENGLEMANN read a paper entitled

BIRTH- AND DEATH-RATE AS INFLUENCED BY OBSTETRIC AND GYNECIC PROGRESS.[1]

DR. E. M. HARTWELL: As regards the general subject of birth-rates in America, it is well to remember that they are far from satisfactory, and must be taken with some degree of allowance. Here in Boston births are not returned promptly or, in all probability, accurately. Another ratio than that to the total population is needed, as we live in a city that is largely recruited by immigrants, mostly of the male sex. Our mortality statistics, owing to the legal requirement of death certificate as a prerequisite for a burial permit, are, of necessity, much more trustworthy than our birth and marriage certificates.

I have wanted for a long time to publish the number of births by months, in the monthly bulletin of the statistics department, but such figures would be without significance, as under the present system the number of births registered in a given month do not represent the actual births of the month. Two or three months before the time when he has to make returns to the State House, the city registrar has a general round-up of babies made, in order to ascertain the number of births within the year. The present condition might well be improved, but part of the trouble is owing to the incomplete and dilatory returns of births by physicians. Within ten years it was discovered that a certain man reported in one year some ninety fictitious births for the sake of the quarter of a dollar paid for each certificate. But as the law now stands those fictitious births figure in the birth-rates, as they cannot legally be expunged from the records.

In the statistical department I have not yet taken up comparative mortality tables, and would be loth to do so until there is an improvement in the tables of population. There has been an epidemic of lowered death-rates in American cities. Inaccurate and boastful estimates of the annual increase of population in the intercensal years helps to lower death-rates. I know of one city in which the method of estimating population practically amounted to guessing at the number of houses and multiplying by five. I can show you three several estimates of the population of Balti-

[1] See page 505 of the Journal.

more for the year 1898, each stated to be "official." These were (1) 500,000, (2) 625,000 and (3) 541,000. On the latter the death-rate was based. In 1900 the United States census gave Baltimore a population of only 509,000. In view of such uncertain data, I refrain from comparing death-rates. I think that the death-rate in Boston is more accurately given than in most other cities. In studying birth statistics we need better material to work with. If we could get the detailed material concerning Boston which is contained in the United States census schedules, much of which will never be published by the Census Bureau, we could make some very instructive tables. I have taken some steps toward procuring the material. It is most desirable, I wish I could say it is probable, that the city shall appropriate $5,000 to pay for copies of the Boston schedules for 1900, which will be used as the basis of comparison for a hundred years.

The last annual report of the city registrar is a great improvement on its predecessors. It contains a number of tables showing death, marriage and birth statistics by wards. The multiplication of such tables will enable us to attain clearer ideas of the local conditions which obtain in different parts of the city, and may serve to suggest more effective measures for reducing the death-rate.

I trust that Dr. Engelmann's paper will be published and widely read. It should arouse discussion as to the reasons for the deplorable conditions he has depicted. If our birth-rate is diminishing, it is a matter of capital importance.

It would, perhaps, be better if the birth-rate were based upon the number of married couples instead of the total population. It is largely owing to Dr. Engelmann's activity, I may say, that the forthcoming census report will contain tables relating to fecundity.

DR. ALFRED WORCESTER: I am inclined to think that the number of births reported is much less than those actually occurring. Families employing midwives or relying upon the kindly aid of neighbors are not apt to bother about reporting births, while the yearly house-to-house visitation to find out whether any children have been born in the past year is apt to be most slipshod; so, too, physicians who go outside of their own town to attend confinement cases, are very apt to forget to make any reports, being under no compulsion to do so.

DR. E. O. OTIS: In listening to these disappointing results that Dr. Engelmann has told us, we cannot but find hope in the possible faultiness of the statistics to which Dr. Hartwell has alluded. It is interesting that the French Canadians have such large families, far larger than women of the same stock have in France, women gaining in importance with the number in their family.

DR. J. G. BLAKE: As far as the death-rate in confinement is concerned, it seems to me that new methods of treatment are needed. I think that the old methods of treatment in difficult cases have been developed as far as is practicable, and that to get better results we must have recourse to new methods, like Cæsarean section, for instance. Certain cases cannot stand the shock of giving birth to a child. If Cæsarean section can be developed far enough it might give some hope in such cases. As to birth statistics, any applying to Boston must be mere conjecture. In the old days we never bothered about reporting cases. I am confident that even now a more accurate compliance with the law would give a far better birth-rate. Many a child is born in Boston and moves out of the city, of whose existence the registrar has no idea.

DR. ENGELMANN: The figures which I have given are corrected figures. I have myself asked a sufficiently large number of women in various dispensaries, "How many children have you had?" to have been struck with the closeness of the result thus obtained with the corrected figures for Massachusetts and Michigan.

As to reducing mortality in childbirth, it seems to me that some hospitals, with their mortality of .05%, have shown what can be done. The trouble is not with the hospitals, but with the profession at large. Now the hospitals, even with all their desperate cases, give better results than those of private practice.

DR. HARTWELL: There is one gleam of hope in Dr. Engelmann's figures. While there has been a reduction in the maternal mortality, the number of stillborn children has not fallen correspondingly. It may be that there is an irreducible minimum of stillbirths, due possibly to conditions incident to the immense increase of our urban population in late years. After the inhabitants of our great cities become adapted to an urban environment, it is quite conceivable that birth- and death-rates may improve.

DR. BLAKE: I would like to bear testimony to the supreme excellence of the aseptic training that I see among the younger physicians by whom I am called in consultation. I should also like to ask Dr. Green, as representing our lying-in hospital, if in his judgment there is any direction in which advance will improve the present maternity statistics.

DR. C. M. GREEN: I cannot say that I see any great chance for improvement except possibly in the treatment of eclampsia, to which a relatively large number of the present deaths are due. We do not as yet really know very much about eclampsia anyway, and it is possible, with more definite knowledge about the disease, great advance in methods of treatment will be made.