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THE STORY OF PRENATAL CARE*

PRESIDENTIAL ADDRESS

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BY PRECEDENT, the address of your presiding officer has been directed not to the presentation of some new scientific achievement but rather to the analysis of underlying movements or philosophies that influence our special field of medicine. Sampson spoke to you of "Hobbies," Gellhorn on "Constitutional Factors," Graves on "The Control of Life"; and gracefully worded historical reviews have been presented by Chipman, Keene, Anspach and Watson. Having in mind this year's symposium on the prevention of eclampsia, it seemed fitting and perhaps of some interest to narrate briefly the story of prenatal care.

THE STORY OF PRENATAL CARE

From the beginnings of time the pregnant woman has always been regarded with reverence. Special privileges were granted her and so sacred was her abode that even a murderer seeking shelter under her roof could not be taken forth and killed. If she was physically injured by some one, the punishment was death. If she herself had done some crime, verdict was postponed until her child was born.

Many ancient records contain instructions for the care of pregnant women. A Chinese work enjoins them to avoid rich food, excessive

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exercise and "strange and wonderful preparations." Both the Old Testament and the Talmud give detailed advice concerning the conduct of women in pregnancy. In India the Hindu priests held conclaves in which obstetric nurses were consecrated and instructed in the prenatal and postnatal care of their patients.

Hippocrates and his school centered attention largely on the prevention of abortion. They warned against excessive purgation and coitus. Fear and great excitement might also interfere with the proper development of the pregnancy.

More explicit than Hippocrates was Susruta, writing in India in the second century before Christ. He set forth rules as to food and drink, exercise and clothing. The pregnant woman should be surrounded by cheerful company both for her own and her child's sake. He cautions against marriage with a woman whose family is tainted with epilepsy or tuberculosis.

In the days of the Emperor Trajan lived Soranus of Ephesus who devoted many chapters of his book on gynecology to prenatal care. Concerning the tendency to abortion from physical exertion and trauma, he writes quaintly: "Houses built on a firm foundation stand unshaken a long time, whereas the house that has a bad and loose construction falls under the slightest strain." Wrinkling of the abdominal skin can be avoided by anointing with a wax ointment mixed with oil made of unripe olives and myrtle. Toward the end of pregnancy a warm sitz-bath softens the tissues and produces an easy labor.

In the succeeding centuries and through the middle ages attention was directed largely to the management of labor and no important contributions were made to the study of prenatal care.

In 1584 a French physician, Scevole de Saint-Marthe, wrote a Latin poem entitled "Paedotrophia" (the nurture of children), containing much good advice on prenatal care. It opens with the lines:

"Don't till 'tis born defer thy Pious care
Begin betime and for its birth prepare."

Further on it reads:

"Refresh thy weary limbs with sweet repose
And when fatigued thy heavy eyelids close.
Be careful how your meats you choose
And chosen well, with moderation use."

Not until we come to the great Mauriceau in 1668 do we again find a significant contribution to the hygiene of pregnancy. In his *Maladies des Femmes Grosses* he devotes an entire chapter to this subject, beginning: "The pregnant woman is like a ship upon a stormy sea full of white-caps, and the good pilot who is in charge must guide her with prudence if he is to avoid a shipwreck."

"Fresh air, avoidance of extreme heat or cold, and freedom from smoke and foul odors are essential to her health. She should eat well-cooked

wholesome food in small amounts at intervals rather than at one large meal. Forbidden are highly spiced pastries, for they create gas. Fresh fish caught in streams are better than lake fish. And with this food a bit of good old wine, tempered with water, rather red wine than white wine, aids the digestion. Beware of cold drinks, for did not the Empress of Austria in July, 1677, take strawberries and ice, and abort at the fourth month of her pregnancy?" Since the prominence of the abdomen in pregnancy prevents women from seeing their feet, Mauriceau advises low-heeled shoes which will prevent them from tripping. Stooping in the later months may lead to faulty position of the child and interfere with the somersault that normally brings the head into the pelvis. For constipation he recommends eating apples, stewed prunes, and fresh figs. If necessary, he prescribes a mild enema of marshmallow, pellitory and anise with two ounces of beet sugar and a little oil.

Above all Mauriceau harangues against those terrible whalebone corsets worn by women of the upper classes who wish to conceal to the last moment the fact of their pregnancy. Squeezed from above, the abdomen is distended below. "When the mother finds her abdominal walls wrinkled and pendulous like a bag," he writes, "the poor midwife is accused of not having used the proper ointment, when the real cause lay in the prolonged wearing of the corset." The age-old custom of bleeding pregnant women is accepted with reservations. Nevertheless he cites a case in which a woman was bled 90 times in one pregnancy without apparent harm.

From Mauriceau we jump to the beginning of the nineteenth century for other evidence of special interest in prenatal care. In preparing this paper I glanced through the Catalogue of the Surgeon General's Library and was amazed to find record of no less than 55 dissertations written by graduates of French universities from 1800 to 1840 on the "Hygiene of Pregnant Women." I contrived to read about twenty of these dissertations. As a whole they do not display any great originality, and the manner of treatment is rather stilted; but their number is certainly evidence that French obstetricians of that period were keenly alive to the importance of giving prenatal instructions to pregnant women. There is a good deal of common-sense advice in some of these dissertations and a few examples may be of interest. Leglay writes (1812): "Have indulgence for the pregnant woman's caprices, listen to her desires with complaisance, console her and in place of the severity of the doctor, adopt rather the affectionate tone of a friend or a father." "Walking is the best form of exercise," says Nolette, "but it should be done in moderation and not transformed into a task or it will lose its advantage. Rather should the path of her promenade have pleasant surroundings and be made with good friends whose conversation may have so much charm that she will forget what was the purpose of her

walking." Ledesert warns against listening to the stories of gossips and matrons concerning the terrible experiences of other women in labor.

Venesection was accepted as a routine procedure during pregnancy among French obstetricians of this period. The problem was how often it should be done, at what period, from what extremity the blood should be taken and in what amount. It is interesting that at this same time German writers (Busch, Boer, Jörg, Naegele) were almost a unit in pointing out the dangers of routine venesection. Their instructions for the care of pregnant women do not otherwise differ materially from those already described.

In England, Denman (1801) warns against partaking of animal food in pregnancy. Women at this period usually prefer vegetables, fruit, and everything cooling. Concerning purgation he writes: "The more gentle the means for the removal of costiveness, the more eligible they are, provided they answer the intention." He warns against the use of opiates for insomnia. A glass of cold water at bedtime will often suffice.

American obstetricians of the nineteenth century made a few valuable additions to prenatal care. W. Tyler Smith (1849) urges dental hygiene in pregnancy to prevent complications that may lead to abortion. Hodge stresses psychic management. The expectant mother should indulge in suitable reading and cheerful conversation, keeping away all stories relating to the complications of labor in other women.

Before considering present conditions among civilized peoples, a few examples of the customs among savage races might be of interest. Superstitions of all sorts are deep-rooted. Evil spirits are believed to be the cause of fetal death and abortion. Yawning is very dangerous, for the demon seizes this opportunity to jump into the body and kill the child. Beware of walking in the moonlight, as there are devils about! Pregnant women are sequestered in special houses away from harmful influences and in one tribe a bell is placed on the ankles of pregnant women so that the tinkling sound will warn others to keep away. In South America the natives do not eat lamb for fear of giving their child a stub nose. Salty or greasy food is declared harmful and a diet limited to cocoanut milk is advised in the last months.

Numberless examples are related of maternal impressions. In fact this subject has been ardently discussed pro and con all through the ages up to the present time. The Greeks and early Christians considered that beautiful children were the result of gazing at beautiful objects in pregnancy. From Utrecht comes a yarn related by Schwammerdam in 1672 of a woman who while pregnant saw a Moor, and to avoid having a black child quickly washed herself with warm water. The child at birth was white except between the toes and fingers, spots untouched by her ablutions. Birth marks were often produced because certain foods had been denied the pregnant woman. Against the views

of the majority occasional voices were raised. Colombo of Cremona in 1559 declared that monstrosities were not due to the devil or to sodomy but were the result of faulty development. A cogent argument against maternal impressions according to Blondel in 1727 was the fact that illegitimate mothers could not destroy their offspring by their most intense wishing.

Belief in the mysterious influence of mind over matter has come down to the present generation, and we find one of our founders, the first president of this society, Fordyce Barker, a convinced advocate of the doctrine of maternal impressions. At the meeting of the American Gynecological Society in 1886 he reported several instances of deformities produced in this way. In the discussion that followed Busey narrated 41 additional cases. Only one man raised his voice in opposition, John S. Billings, who said that such effects ran counter to all our knowledge of the physiology of pregnancy and hence we must simply say: "we do not know." A resolution was passed to have the question investigated by a special committee of three but our transactions do not record the report of that committee. Hirst's *Obstetrics* in 1888 stated that maternal impressions were a proved fact and even as late as 1902 Dickinson-Norris' textbook conceded them as a probability. The studies on pathologic embryology by Mall and Streeter have now shown the fallacy of these theories and point the way to methods of prevention.

The most important chapter in this story of prenatal care deals with the prevention of eclampsia and its associated toxemia. Previous to the middle of the nineteenth century the diagnosis and prevention of impending eclampsia was based wholly on clinical observations. Text-books are full of accurate descriptions, vividly portrayed, of the premonitory symptoms. Dewees relates of a rapidly fatal case in which the patient suddenly cried out: "My head! My head!" and fell into convulsions. Epigastric pain, tingling of the ears, blind spots, and edema of the face and hands were evidence of plethora, and bleeding would alone prevent the eclamptic outburst.

It was in 1843 that J. C. Lever in England first noted the constant presence of albumin in the urine of patients with eclampsia or pre-eclamptic symptoms. At about the same time in France, Rayer, followed by Blot, Labat and Mayer Cahen noted the constancy of these findings. It was not long until the urine of every patient with edema or headache was examined and the appropriate treatment instituted where albumin was found. James Simpson of Edinburgh confirmed the uniform presence of albuminuria in eclamptic patients and in 1859 concluded that "albuminuria, dropsy, and convulsions are successive effects of one common central cause—viz, a pathologic state of the blood, to the occurrence of which pregnancy in some way peculiarly predisposes."

In Germany autopsy findings on eclamptic patients demonstrated the consistency of kidney pathology in these cases.

It was an accident of economic circumstances that led to the establishment by E. B. Sinclair and G. Johnston of the first prenatal clinic in the world at the Dublin Maternity Hospital in 1858. Owing to the crowded condition of the hospital, applicants for maternity care had to present themselves for admission several months before their expected confinement. Their card had to be signed by one of the physicians of the hospital, who took this occasion to make a brief record and physical examination. Every woman with edema, headache, dizziness, or albuminuria was treated actively. She was instructed to attend the dispensary regularly, and, if necessary, was admitted into the chronic patient's wards of the hospital. Here she was purged freely and repeatedly, made to maintain a horizontal position in a cool ward, and allowed none but the mildest and lightest nourishment. Sinclair and Johnston found that by these measures the incidence of eclampsia was greatly reduced. In fact almost the only patients with eclampsia were untreated emergencies who had not come to the dispensary.

The next important advance was the discovery of blood pressure elevation in eclampsia. It was a lapse of almost half a century from the first mercury manometer used by Ludwig in his animal experimentation, to the air-inflated sphygmomanometer of Potain in 1888. Working with the latter instrument Vinay in 1894 noted the regular occurrence of a high systolic blood pressure up to 180 to 200 mm. of mercury in women with eclampsia. Three years later Vaquez and Nobecourt amplified these findings and found that they preceded the convulsive seizures. At the German Gynecologic Congress at Giessen, in 1901, Fütth and Kroenig reported a uniformly high blood pressure in preeclamptic patients. In the same paper they also showed certain differences in the freezing point determinations of the maternal and fetal blood. In the discussion that followed, the question of freezing point was carefully considered but the value of their blood pressure findings was completely overlooked.

At Johns Hopkins University in 1903, H. W. Cook and J. B. Briggs made careful studies of blood pressure after operations, during normal pregnancy and in eclampsia. Their conclusions were: "It is especially with regard to the early recognition of the onset of eclamptic features in any case and the possibility of instituting prompt and vigorous treatment for their relief that systematic blood pressure records may be of value to the obstetrician. The onset of hypertension at any period of pregnancy should always excite the apprehension of eclampsia in the absence of other recognized causes of abnormally high blood pressure."

Although this paper was published in the Johns Hopkins Hospital Reports in 1903, neither it nor the preceding European reports were mentioned in the symposium on eclampsia held by our Society two years later. Even in 1910 and 1912 when we again discussed this sub-

ject, only Hirst and Polak stressed the usefulness of blood pressure readings. In Europe, in spite of additional work by Vaquez, Wiener and others, the compendious *Handbuch* of von Winekel in 1907 fails to recognize the value of blood pressure measurements in eclampsia. It was not in fact until twenty years after Vinay's first work that the true significance of these findings was generally appreciated.

The establishment of special clinics for prenatal care on a nationwide scale under university, hospital, or municipal administration dates back to the beginning of this century. Previous to 1900 we had only one such clinic, that already mentioned at the Dublin Maternity established in 1858. The man who first visualized the possibilities of prenatal care thus organized under hospital supervision was James Ballantyne of Edinburgh. Influenced by many years of study in antenatal pathology, he urged the establishment of a prematernity ward for the care and study of pregnancy complications. By dint of persistence the one bed provided at the Royal Maternity Hospital in 1901 for these investigations grew to a 23-bed ward two decades later. Ballantyne in addition to being a great scientist and clinician had in him the strain of a visionary. The dawn of the twentieth century found his spirits rising with the hope of an age when all expectant mothers would be properly cared for. In fantastic mood he pictures the perfect prematernity institution of the future. It is situated in the town of Weissnichtstadt, somewhere on neutral ground between France and Germany, built by the munificence of an American millionaire, and officered by an international staff. Over the doorway runs the legend: "Teach us what we shall do unto the child that shall be born." In one ward abortions and premature labors are being prevented. In another, the so-called "hall of the innocents," syphilis in the pregnant mother is being eradicated. The room whose doorway is labeled "Hereditry" contains a hemophiliac who is being cured by some new method. In the Roentgen room the art of prenatal diagnosis is being perfected. Many of these dreams of Ballantyne have indeed come to pass. Only the concluding remarks of the physician-in-charge sound strangely incongruous at the present time. Ballantyne puts these words into his mouth: "In this twentieth century we prevent everything—war, disease, hurricanes—everything except the doing of good to others." We are thankful that Ballantyne did not live to see how far this Utopian vision is from being fulfilled.

In England the movement for prenatal care was greatly aided by the National Health Insurance acts of 1911 and 1913, providing for maternity benefits. In 1914 the local Government Board issued a circular offering a grant to local authorities for antenatal care. This included: (1) local supervision of midwives, (2) antenatal clinics, (3) home visiting of expectant mothers, (4) provision in hospitals for treatment of the complications of pregnancy. By 1927 there were already in existence 600 prenatal clinics in England alone.

In the fully organized obstetrical services of the Scandinavian countries and Holland the establishment of proper prenatal care through midwives and physicians was relatively simple. In Holland according to Dr. DeSnoo the work has been done individually with each patient through the person in attendance, rather than through a general prenatal clinic as elsewhere. Soviet Russia has devoted special consideration to the care of the expectant mother. On a nationwide scale it has established centers for maternal welfare where patients are instructed and examined. This is one of the big accomplishments of the present government.

In France Pinard led the movement for prenatal care. The interruptions of the Great War were partly compensated by the splendid cooperation of American physicians at the time of its conclusion in 1918. Dr. Fred Adair was in charge of a portion of this prenatal work during these years and the experiences gained there stood him in good stead when he took over the chairmanship of the Committee on Maternal Welfare in this country. This committee's activities were the indirect outgrowth of the Conference on the Prevention of Infant Mortality held at New Haven in 1909. The work progressed rapidly and by 1915 Whitridge Williams prepared a model prenatal record sheet. "The best results in prenatal care are obtained," he says, "when work is begun in the obstetric dispensary of a well-regulated hospital, continued in the lying-in wards and completed by the children's hospital with its milk fund and baby saving devices."

In 1920 a committee of three was appointed by the American Gynecological Society to confer with similar committees appointed by the American Pediatric Society and the American Child Health Association to plan for the development of a maternal and child welfare program in the United States. The splendid work of this committee and its successors is too recent to need amplification here. Its influence was made nationwide by the publicity and the illuminating studies that grew out of the White House Conference of 1931, studies in which the Fellows of our Society took a distinguished part.

At the present time I think it is not an idle boast that in spite of the handicaps arising from our vast territory, the admixture of various races, especially negroes, and the heterodox requirements for medical practice, we have succeeded in this country in developing one of the best organized systems for prenatal care in the world. It is a chapter in our obstetric development of which we have reason to be proud.

Such in brief is the history of prenatal care. In conclusion may I recall to your mind one episode from this record that should have a special significance for us at the present time. I refer to the discovery of blood pressure elevation as an index of threatened convulsions. In 1905 the Fellows of our Society gathered for a symposium on eclampsia.

French and German medical journals had for ten years previously contained important contributions on the subject of hypertension in eclampsia. In our own country Cook and Briggs had made careful observations on high blood pressure associated with eclampsia as early as 1903. Yet by no word or suggestion was this fundamental advance recognized in our discussion of the subject. I bring this up not in a spirit of criticism but to ask you here today to consider whether we may not in similar manner be overlooking discoveries, already made, but whose value we have not fully recognized. As Fellows of this Society, is it not our responsibility, not merely to add to the sum-total of scientific knowledge by our own investigations, but also to develop our critical faculties, so that we may become discerners of the truth, able to pick the grain from the chaff, and ever alert to recognize great discoveries promptly when they are made? By so doing, we shall materially hasten the progress of medicine.

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