larger amounts, a more gentle and prolonged effect. The difference in action is due in the main to a difference in solubility—erythrol tetranitrate is a crystalline solid and much less soluble in water than nitroglycerin; mannitol hexanitrate, which is still less soluble, exerts a correspondingly weaker effect.⁴

The nitro-sugars possess an action similar to those solid organic nitrates. They too are solid, but the three investigated—glucose nitrate $[C_6H_6(NO_3)_5CHO]$, levulose nitrate $[C_5H_6(NO_3)_5CO]$, and saccharose nitrate $[C_{12}H_{14}O_3(NO_3)_8]$ —are non-crystalline. At ordinary temperatures they are of a pasty consistency; at low temperatures they are brittle solids. Their solubility in water is very small; they gradually decompose in air, and like all bodies of this class, they are explosive.

Their pharmacologic action corresponds to their chemical constitution and solubility in water. A saturated solution in 40 per cent. alcohol injected into the circulation causes an immediate and somewhat prolonged fall of blood-pressure, and when injected through a catheter into the stomach a similar, but delayed, slighter and more prolonged fall is obtained. Perfused through the vessels of an isolated kidney, they all cause distinct dilatation, apparently of almost equal degree. They also exert a similar action on the pulse of man, but the effect is not great. The following figure shows that produced by 0.1 gram of glucose pentanitate:

On urinary secretion the effect is slight. In the few experiments made the variations seemed to follow those of the blood-pressure.

These bodies, in fact, act in every way like the other solid organic nitrates of this class. Like them, they are readily reduced on boiling with dilute alkalis, and the explanation of their action, whatever it may be, is the same. They are, however, much less stable and much less active than erythrol tetranitrate, and on this account it is doubtful if they will find a place in therapeutics. Strange to say, they possess a very bitter taste.

THE CLASSICAL CESAREAN VERSUS PORRO CESAREAN.*

GEORGE M. BOYD, M.D.

Professor Clinical Obstetrics, Medico-Chirurgical College; Physician to the Philadelphia Lying-in-Charity.

PHILADELPHIA.

As the present year completes the nineteenth century and we are about to be ushered into another with all its responsibilities, it is natural for those of us who are interested in the history of midwifery to look over the past and also think of the possibilities of the future.

The remarkable advance which has been made, particularly in the latter half of this century, has revolutionized our science, resurrecting operations which were in the writer's student days spoken of only in condemnation. We refer to the classical paper on the "Contagiousness of Puerperal Fever," by Oliver Wendell Holmes, in 1843; next, the work of Semmelweis, of Vienna, in 1846, and later that of Pasteur in bacteriology, and its application to surgery by Lister. The works of these illustrious men have established forever the fact that the so-called childbed fever is an infection.

The antiseptic era has revolutionized obstetric surgery. It has made the physician all the more appreciate

the fact that the problem before him for solution is a grave one and that at any moment in the progress of labor he may find himself facing an operation which must be performed, not only intelligently, but immediately.

This century has given us the child-saving operations: axis-traction for the forceps, the modern symphysiotomy, and the modern Cesarean section.

The century is closing with our science placed on a higher plane than ever before in its history. The obstetrics of to-day conserves the child's interests more than it ever did in the past. It makes us all the more mindful of the fact that we have two lives at stake and that we have no right to sacrifice one to save the other.

The twentieth century still has much to accomplish. Let us hope that with the advance of civilization the midwife will soon be a thing of the past, or else remedy the evil by compelling her to attend a full course in medical training, for none other than the physician has a right to assume the responsibility of an obstetric case.

My object in this paper is to defend to the best of my ability the classical Cesarean section as the operation of choice whenever it is essential to deliver by abdominal section; also to express my views in answer to the question: Does the life of the child alone indicate the Cesarean section? My conclusions are based on an experience gleaned from my private work and the work of two teaching maternities—the Philadelphia Lying-in-Charity for twelve years, 8000 cases, and the Medico-Chirurgical College Maternity for six years, 1500 cases: also the study of the published results of others.

In these two maternities thirteen successful Cesarean sections have been performed. Of this number six were by the writer, seven by my colleagues. Twelve of these cases were the classical Cesarean by choice; one was a Porro by necessity.

The Cesarean section is so frequently performed now and—in the hands of the experienced—with such a low mortality that the day, we believe, is not far distant, if it does not already exist, when, for the child's interest it will be elected in some cases over high forceps, version, induction of premature labor, and symphysiotomy. If the mortality is as low as we claim, the operation will be more generally resorted to and we may expect in the future a new chapter added to obstetrics.

If we follow closely the recent literature on the subject we believe that the above statement as to mortality can be substantiated. Each month is adding to the accumulating evidence.

A recent paper by Reynolds¹ on "The Conditions which Govern Success in the Sanger Cesarean Section," embodies my views so precisely that I will take the liberty to draw from his text. He reports fourteen successful cases and makes the following two propositions:

1. "That when the mother's vitality has been seriously lowered by either septic infection, prolonged labor, or complicating disease, the mortality of the Cesarean section is so high that it is an unjustifiable operation, and in such cases symphysiotomy should be done when it is applicable or, if it is not, craniotomy to the living child should be unhesitatingly preferred to the section, in the interests of the mother."²
2. "That when the mother is in good condition, that is, when she is generally sound, uninfected, and not

4. Bradbury: The Lancet, 1895, II, 1205.

* Read by title before the Section on Obstetrics and Diseases of Women, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.

1. Obstetrics, January, 1900.

2. Always excepting cases in which the hopeless condition of the mother leaves the child's interests only for consideration.

exhausted by long labor or by prolonged efforts of delivery by the forceps, the Cesarean section is so safe an operation that it may be used unhesitatingly in cases at term, whenever an intrapelvic deformity would be fatal to the child, and may often be preferred even to the induction of premature labor, on account of its superiority in the saving of fetal life."

He analyzes the two largest lists of Cesarean sections recently published, that of Everke's 35, and Leopold's 100.

Excluding the cases of hysterectomy and those infected, or else exhausted by long labor, that were operated on, he finds 74 cases come under his second proposition.

To this number he adds his 14 cases, making 88. I will take the liberty to make the same analysis of the 13 cases herein mentioned and will remove one case, a hysterectomy, leaving 12 cases operated on in good condition, by hysterotomy. This makes a grand total of 100 cases. In this series there were but two deaths; both cases were operated on many years ago when our technique was not as good as it is now.

"The most favorable showing for the neglected or complicated cases, that of Leopold, gives almost one death in every four." It would seem from these statistics that the Cesarean section, if anticipated and not performed as a *dernier ressort*, is accompanied with so low a mortality that the life of the infant would be a sufficient indication.

Accepting this proposition it becomes our duty to be prepared to operate by abdominal section in all cases giving the history of one or more labors resulting disastrously to the infant.

In pelvic deformity the patient in many cases should be given the test of the first stage of labor and if the head is fixed at the inlet the forceps may be applied and judicious traction made; failing in this, abdominal section should be resorted to.

For eclampsia developing at or near term when for certain reasons it does not seem wise to resort to manual dilatation of the cervix, abdominal section will rapidly empty the uterus and enable us to bring about free blood-letting, which is often beneficial. Olshausen advises Cesarean section in severe cases of eclampsia occurring before the onset of labor and with undilated or unyielding soft parts.

Hillman reports a case of eclampsia in which he was forced to perform Cesarean section. The woman, a primipara, 23 years old, came under observation after she had had six convulsions. She was cyanotic and comatose; pulmonary edema, no labor pains, os completely closed. The operation was performed to save the mother's life. It could not be decided whether the child was alive or dead. After the uterus was emptied there were no further convulsions and immediate improvement was followed by recovery. The child was still-born.

For placenta prævia, particularly the central variety, when the patient has not been depressed by excessive hemorrhage, abdominal section will conserve the child's interests, and the patient will escape the hemorrhage subsequent on any operative interference per vias naturales.

For prolapse of the cord complicating the vertex, especially in cases where the cord can not be repositioned and podalic version is entertained, here, in some cases, section may suggest itself.

There exists a difference of opinion among American Cesareanists as to which is the better method of oper-

ation, the Sanger or the Porro. The writer believes that the same conservatism which has cared for the child must be applied to the mother, and that a mutilating operation should be only one of necessity.

The celio-hysterotomy has many advantages over celio-hysterectomy. We can not agree with those who believe that a woman should not be exposed to the danger of a second Cesarean.

Celio-hysterotomy has a lower mortality, can be performed more readily, and above all it is the operation which conserves the mother's interests and by so doing broadens the field for the Cesarean section. On the other hand, celio-hysterectomy is mutilating, has a higher mortality and should only be performed when the patient is infected or when some tumor of the uterus makes it necessary. Celio-hysterectomy should not be performed simply to prevent future pregnancy, when ligation of the Fallopian tubes—which is less mutilating—will accomplish the same purpose.

In reviewing my six cases we find the following:

CASE 1.—Flat rachitic pelvis; also extensive fibroids of the uterus. Patients two days in labor, infected. Hysterectomy was necessary.

CASE 2.—Scolio-rachitic pelvis. A second Cesarean, an elective operation. Hysterotomy performed.

CASE 3.—Coxalgic pelvis; a II-pari; first labor ended in craniotomy; operated on during labor. Hysterotomy.

CASE 4.—Generally contracted pelvis. Patient has had six dead children. Elected date. Hysterotomy.

I wish to place on record my fifth and sixth cases, operated on in February and March of this year.

CASE 5.—A third Cesarean for scolio-rachitic pelvis. Mrs. C.; married; aged 34 years, was admitted to the Medico-Chirurgical College Maternity Feb. 13, 1900. In September, 1892, she was delivered by the elective Cesarean³ section in Kensington Hospital for Women, Philadelphia. Dr. Charles P. Noble operated, the writer assisting.

Five years after this, in 1897, she was admitted to the Philadelphia Lying-in-Charity in her second pregnancy, and well advanced in the last month. With the history of this artificial delivery and the patient again in the last week of gestation a second Cesarean seemed indicated. The staff of the hospital agreed with me in this opinion. Examination of the patient proved the fetus to be of good size, presenting by its pelvic pole. The following measurements were made: intraspinous 27 cm., intracristal 28 cm., external conjugate 17 cm., diagonal conjugate 8.5 cm., true conjugate 7 cm.

A second elective operation was performed Aug. 12, 1897. A free incision was made through the abdominal wall to the side of the old linear scar. Several omental adhesions were now loosened, then it was found that the uterus and abdominal wall were firmly united at the lower angle of the old incision. The uterus showed no evidence of the result of the first operation. The silk sutures used could not be found. Although this strong attachment between uterus and abdominal wall interfered with the compression of the organ it did not seem wise to make the dissection.

A clean incision was now made parallel with the long axis of the uterus just sufficiently large to permit the extraction of its contents. The fetus, presenting by the breech, was delivered head first through the incision. The uterine wound was closed with interrupted silk sutures just escaping the mucosa. For the abdominal wound silkworm gut was used.

The third Cesarean was performed in February last, at the Medico-Chirurgical College Maternity. In this

3. Annals of Gynecology and Pediatrics, January, 1893.

operation the patient had the test of a thirteen-hour labor without progress.

The incision was this time made over the old scar. Because of the firm union between the uterus and abdominal wall at the lower angle of incision a transverse fundal incision in the uterus was made. The child, a female weighing $7\frac{1}{2}$ lbs., was with ease removed, and the uterus nicely contracted.

The puerperium was uneventful. Mother and child left the hospital in four weeks. Both were in good condition.

CASE 6.—An obliquely contracted pelvis. Mrs. B., a multipara, aged 37 years, was admitted to the Philadelphia Lying-in-Charity, Feb. 28, 1900. The history of her previous labors is briefly as follows:

The first labor was long (52 hours) and finally terminated by the use of forceps. The child was dead.

The second labor, also long, resulted in craniotomy. As a result of these two instrumental deliveries the soft parts were badly torn, demanding two years ago the removal of the left ovary, trachelorrhaphy and a ventrofixation of the uterus. The patient comes to us a third time pregnant, near term. Her previous history is explained in an examination of the pelvis. It is contracted and the left oblique measurement is much encroached upon.

Cesarean section was performed after the test of a fourteen-hours labor. An interesting point in the operation was the effect that pregnancy had had on the fixation of the uterus. Fortunately the uterus was not firmly attached, else we might have had another cause for obstruction.

The growing uterus had left its point of attachment and a cord-like band six inches in length had formed, extending from the fundus over the anterior wall of the uterus to the point of attachment. A longitudinal incision was made in the uterus and the child easily removed. The infant was a male weighing $9\frac{1}{4}$ lbs. Mother and infant left the hospital in one month in good condition.

In conclusion, I would say:

1. That the life of the infant alone, under certain conditions, justifies the Cesarean section.

2. That the classical Cesarean has as low a mortality as an easy ovariectomy. Is not the life of the child then as good a reason for performing a simple abdominal section as are the vague symptoms for which operations are daily done?

3. That the classical Cesarean is less mutilating than the Porro Cesarean, and, with the patient in good condition, is therefore the operation of choice.

4. That the Porro Cesarean has about the same mortality as has hysterectomy for fibroids. That it should be performed when the patient demands it, or when infection or a neoplasm of the uterus makes it necessary.

5. That it is the duty of the practitioner in attendance on a multipara with the history of one or more dead children, to be prepared to perform the Cesarean section. If he does not possess the necessary surgical training then he should call to his assistance the obstetric surgeon.

1953 Locust Street.

Lumbar Puncture in Miliary Tuberculosis.—Dr. William Osler recently showed, at his clinic, specimens from a patient who had died of acute miliary tuberculosis, and in whom the diagnosis had been made by lumbar puncture, the fluid exudate obtained showing an enormous number of tubercle bacilli. The disease is almost invariably mistaken for typhoid fever.

OCEAN CLIMATES: THEIR EFFECTS AND THE CASES THEY BENEFIT.*

JOHN A. ROBISON, A.M., M.D.

CHICAGO.

We are all familiar with land climates, for obvious reasons, but a study of ocean climates is desirable, because a sea voyage is often beneficial when a change of land climate is of no avail. And why this is true is readily comprehended when the differences in the climates are observed.

1. The climate of the sea is more equable on account of the temperature being varied by ocean currents instead of winds, as is the case on land. That this is true is proven by the fact that the hottest and coldest months on land are August and February, respectively, because the winds are scorching and freezing during those months, while the hottest and coldest on the sea are September and March, because the southern cauldrons are at their highest and lowest temperatures during those periods.

2. The sea air is warmer. While this statement applies to the parts of the sea which are the ordinary paths of travel, yet as a statement it is true in general, as Arctic explorers have said it was warmer on the sea than on land—or ice. The warmer air is more sedative, and tends to allay nervous irritability of tissue and body.

3. The air of the sea is more nearly aseptic, is free from dust, and contains more ozone than land air, except in the highest altitudes. And it is almost continually in motion.

4. The sea air contains more moisture than land air, and this moisture is laden with the volatile elements of sea water. The dew point is lower than on land, and the sensible temperature is also somewhat lower.

Besides these points of difference, it is interesting to note that the sea currents flow so that the warmest currents hug the shores of the coldest side of the continent, as the so-called gulf stream follows our Atlantic coast, while the Japan stream veers away from our warm western shores. The rising and lowering of the temperature is slower than on land, for the isotherms travel only at the rate of twenty-two miles a day, while the cold or hot waves on land travel with the velocity of the wind.

Thus we see that the sea affords conditions that favor slow travel. And in the days of the sailing vessel it was quite the proper thing for the invalid to take a sea voyage, where he could enjoy pure air, sunshine and the breezes.

What are the effects of a sea voyage? The equability of the climate permits, and the desires of the traveler demand, the spending of the most of his time in the open air, and the pure air is stirred in motion by the continual sea breeze and fans the invalid, and the tonic influence of the air creates appetite, and the enforced rest revives the exhausted body. Quiet of body and mind, freedom from the worry of business and domestic cares assist mother sea in restoring the tired invalid to health. Sea air has a sedative effect on the nervous system, increases metabolism, weight, appetite, and inclination to sleep, and so, to those with whom it agrees, it is a sedative tonic.

From a knowledge of these effects we can readily perceive the class of cases which sea air will benefit. In addition to the general effects enumerated, the air has, also, a sedative effect on the respiratory passages. Therefore

* Read at a meeting of the Chicago Laryngological and Climatological Association, Nov. 15, 1900.