order to understand the sources of error and the limits of reliability.

(3) No laboratory worker should remain out of touch with the clinical aspects of the cases which furnish him his material.

(4) In the absence of any single dominating personality as an integrating factor in the hospital system, the best available substitute seems to be *combined ward visits* in which the pathologist, surgeon, physician, chemist and physiologist work together for the increase of their practical and scientific fruitfulness. The evils of specialism may be thus in a measure neutralized and its benefits enjoyed.

SHORT RÉSUMÉ OF THE HISTORY OF CÆSAREAN SECTION.*

BY ELIZABETH T. GRAY, M.D.,

Visiting Surgeon to New England Hospital.

CÆSAREAN Section is an operation for the delivery of the child at term by means of an incision through the abdominal and uterine walls. This is supposed to be an operation of great antiquity. It is commonly assumed that it takes its name from Cæsar who is said to have come into the world in this way. Pliny mentions several other celebrities, Scipio Africanus and Manlius, who were born in this same manner. These early histories, however, are possibly mythical. But undoubtedly the practice of Cæsarean section dates back to prehistoric times.

A Roman law, ascribed to Numa Pompilius, made it obligatory upon physicians to remove the child by abdominal section in case the mother died during pregnancy.

During the Middle Ages, the Roman Church adopted this law, for by means of it they sought to rescue the child, that the rite of baptism might be bestowed upon it.

To-day it is forbidden in Austria to bury a woman, dying in the second half of pregnancy, without first performing Cæsarean section with all the care and technical skill used in operating during life, in hopes of either saving the child or at least of baptizing it.

Cæsarean section performed *just before* life was extinct has been reported as successful in saving the child, by Runge, in maternal brain tumor, by Frank in maternal general burns, by Sommerbrodt in maternal fibrosarcoma cerebri, by Hay in cerebral apoplexy, and E. P. Davis, of Philadelphia, has reported the delivery of a living child five minutes after the mother had died of eclampsia.

It having been shown that many children were saved in this way after the death of the mother, the question arose whether it would not often be right in cases of protracted labor, and where the life of the child, although not that of the mother, was threatened. This proposal met with bitter opposition and it was urged that to open the abdomen of the mother, even if her condition was hopeless,

in order to save the life of the child, was a criminal procedure, and Virchow cites an instance in which a physician was prosecuted for performing Cæsarean section on a dying woman with hope of saving the child.

The first *recorded* Cæsarean section on a living woman was performed in the year 1500 by one Jacob Nufer, a butcher, who is said to have saved the life of his wife in this way. It is further stated that he operated many times later on other women.

In 1581 François Roussett published histories of fourteen successful Cæsarean sections, six of which were said to have been performed on the same woman. The authenticity of this report is doubtful.

About this time history shows that the operation was several times successfully performed, and many operators hastened to perform it without the proper indications. We are told that for a short time in Italy it became almost as common as blood-letting. Under these conditions a reaction soon set in and the operation fell into disrepute.

Later fresh proof was brought forward to show that it might be safe if performed by skillful hands. Undoubtedly this work of the seventeenth century in Cæsarean section has been greatly exaggerated by historians.

Women have performed Cæsarean section upon themselves. Harris reports that in one hundred and nineteen years six women have successfully performed this operation upon themselves.

The operation has been accidentally performed upon women, far advanced in pregnancy, by rips from horns of cattle. Harris also reports eleven cases of women ripped open by horned animals, eight of whom escaped death. The inhabitants of some of the uncivilized countries, notably in Central Africa, are known to have performed this operation, the result being favorable to both mother and child. Palm wine was the fluid used to wash the abdomen of the patient and the hands of the operator. The abdominal wound was closed by long pins, just as it was closed by the older operator among civilized nations, and sutures were placed over the pins in the figure-of-eight fashion.

The earliest well-authenticated case of Cæsarean section comes from Germany in 1610, by Trautman. The patient lived about three weeks after operation. No doubt was entertained with regard to her recovery. However, contrary to expectation, on the twenty-fifth day after the operation she suddenly became faint and died within half an hour.

Until very recently Cæsarean section was justly regarded as one of the most hazardous operations in surgery. Up to 1873 only from 37% to 40% of the operations resulted in recovery.

Spaeth, writing about this time (1873), said: "There has not been a single case in the lying-in hospitals of Vienna in this century which has terminated favorably for the mother." Godson states, in this same year, that for over one hundred years there was not a single successful case in

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Vienna, and he, with other authorities, make the same claim for Paris. During about this same period Chiaria, of Milan, is credited with sixty-two operations, three of which were successful. The responsibility for these results was due, first, to septic infection, the evils of which were especially felt in hospital practice, and second to the postponement of the operation until the patient was almost moribund. Another great factor in preventing success was the persistent idea that the alternate contraction and relaxation of the uterus forbade the use of the uterine suture; consequently the wound in the uterus was left to gape open, and closure in the few favorable cases was brought about by an inflammatory process which bound the uterus to the abdominal walls.

So strong was this idea that only a comparatively short time ago Porro proposed to avoid the risks of the gaping of the uterine incision by the removal of the uterus at the time of the section, after the delivery of the child.

The operation to-day takes its place among the most successful of surgical procedures, and American surgeons have done much to put it in this position. The success of the present-day Cæsarean section is due largely to the following factors:

First, strict aseptic precautions.

Second, early resort to operation before the patient's strength has been exhausted by lengthy efforts to extract the child by the natural passages.

Third, to the careful and complete closure of the uterine incision.

Fourth, to a *perfected technic*.

In contrast to the reports of the results of the operation, previous to 1873, Edward Reynolds reports as known to him personally thirty operations with thirty recoveries. To obtain such results it is of vital importance that the operation should be undertaken early, that the operator should be familiar with every detail, that it must not be undertaken as a last resort. It must be a conservative procedure, undertaken to save the lives of both mother and child.

Carefully examined statistics show that if undertaken as above the mortality to the mother is no higher than from uncomplicated oöphorectomy and to the child *nil*.

A résumé of the statistics of Leopold, Olshausen and Zweifel show a mortality of 5.8% for the conservative operation, and 3.7% for the Porro.

We find, in difficult forcep deliveries, from 1 to 3% mortality to mother and 25 to 30% to child, and it is a well-known fact that many of the infants who survive this forcep extraction are seriously injured for life.

There are two men who are so closely connected with the history of the modern Cæsarean section that we speak of the operation as the *Porro-Cæsarean* or the *Sanger-Cæsarean*. About 1876, when the maternal mortality was so great that the operation was practically condemned, Porro, of Milan, introduced his method, in which the operation of Cæsarean section was accompanied by the amputation of the uterus. It is claimed that before Porro operated upon women in this

way, he and Spaeth, of Vienna, experimented successfully upon dogs and rabbits. Statistics now showed that this was a very successful procedure and at this time gave a far better showing than the operation in which the uterus was left behind.

Sanger, of Leipzig, now insisted that the suturing of the uterine wall was essential, and after careful suturing was carried out the results were as favorable as in the Porro, without the mutilation of the latter operation.

Undoubtedly in those years when *all* abdominal surgery was dangerous and infection carried off a large percentage of the cases the Porro was a safer operation than the conservative Sanger. Surgical practice has now changed so largely that these two operations have become complementary to each other and are no longer rivals in the same field.

The Porro should be performed when some morbid element makes it dangerous to keep the uterus in the body. Present-day statistics are teaching us that the mortality is lower in those cases where the operation is performed a second or third time upon the same patient than with the first operation, probably because these last operations are operations of election, and so a more favorable time and better preparation is obtainable than in the first operation.

A few cases have been reported where each patient was operated upon successfully four times.

The results of a successful Cæsarean section are so brilliant that there is danger that the pendulum may swing too far on the side of this operation and we must be careful to remember that the section should only be resorted to when the indications are clearly defined, and only after the most thorough preparations have been instituted for its performance and the proper assistance obtained.

INDICATIONS FOR CÆSAREAN SECTION.

BY MARY FORRESTER HOBART, M.D.,

Attending Physician to the New England Hospital for Women and Children.

It may truly be said that the practice of medicine is now dominated by the surgeon. In early times, the surgeon was pre-eminently the "bone doctor." To set fractures, to reduce dislocations and to amputate was his special province. Beyond these functions he was seldom in demand. Now, it is quite a different matter. His co-operation is not only a necessity, but without it we dare not proceed too far.

If we have a doubtful brain lesion, he trephines; if we are treating rhinitis, he removes the turbinates; our pale, delicate children grow rosy after an operation for adenoids and tonsils; our patients with persistent pain between the shoulders have their scapulæ trimmed off, and when we are struggling with the digestive and genito-urinary tract, nothing escapes his zeal. Cases of apparently simple indigestion are found to depend on appendicitis, acute or chronic, or on duodenal ulcer, or gallstones. These recover more quickly