LABOR IN THE ELDERLY PRIMIPARA*

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At the present time, an increasing proportion of women approach their first childbirth at an age much greater than formerly, either because of late marriage or because, for economic or other reasons, child-bearing has been voluntarily postponed. Many of these women have much fear of labor, for lay tradition has assured them that they are particularly prone to have a difficult time.

Practical obstetric experience has shown that, although a certain proportion of these women do have serious difficulty, occasionally even a woman near the menopausal age may have her first baby with surprising ease and rapidity. Apparently, then, age is not the only factor involved or always the most important one. It was for the purpose of evaluating these factors and of determining, if possible, a more intelligent basis for prognosis and treatment that this study was undertaken.

The subject has not received the attention in the American literature which its growing importance deserves. A single comprehensive study by Kate Spain,[1] based on the literature rather than on a personal study of cases, and a brief article by Freeland,[2] considering only certain phases of the subject, are the only ones to be found in the journals, and most of the textbooks give the subject scant mention. In the foreign literature, a long succession of theses in both German and French attest to the importance in which it is held in these countries.

This literature is fraught with controversy. Most of the authorities unite in giving a rather gloomy prognosis for both mother and child, and it is probable that the truly appalling statistics of Cohnstein[3] before the days of antisepsis have had much influence on modern tradition. His statistics, however, were gleaned from the literature and include many cases reported for other complications. Ahlfeld,[4] who reported a series from a single clinic (Leipzig), gives much better results, but even his are not at all cheerful. Yet not all the early authorities are thus agreed. Mme. Lachapelle[5] stated that in her opinion the proportion of difficult labors was not greater in older than in younger primiparas. Mangiagalli[5] emphasized the importance of deformity associated with certain types of contracted pelvis in delaying marriage and in increasing the percentage of older women who had difficulty. Varnier,[6] and later Spain, lay much stress on the influence of complicating factors rather than on mere age. More recently, Leopold Meyer,[7] and with him Jaroschka,[8] advances the theory that the greater difficulty in older women is due not to age at all but to the inclusion in the older group of larger numbers of women who would have had difficulty at any age but who marry late because of definite physical defects or who conceive late because of hypoplasia of the genital organs.

There is no unanimity of opinion as to what constitutes the upper limit of youth from the obstetric standpoint, various authorities placing it at any point between 25 (Fassbaender[9]) and 35 (Mangiagalli). I have therefore decided to accept the opinion of the majority, who place it at 30 years, and have included in the present study all women who had their first babies after reaching the thirtieth year. There were 337 such women, or 4.5 per cent of 7,500 deliveries. They formed 11.3 per cent of the 2,992 primiparas in the series. Of the 337 women, 231 were between 30 and 35 years of age; eighty-five between 35 and 40, and twenty-one from 40 to 45 inclusive. Only eight women were over 40: two of these were 41, three were 42, two were 43 and one was 45.

OBSERVATIONS

Course of Pregnancy.—The course of pregnancy does not differ greatly from that in other women. Although some authorities state that nausea, vomiting and other discomforts of pregnancy are apt to be exaggerated, the present observations do not substantiate this: Twenty-four per cent gave a history of nausea and vomiting, and 14.8 per cent of nausea only. In 3.2 per cent the vomiting was severe. Lynch[10] reported a history of some form of nausea in 45 per cent of 500 unselected cases from this clinic and in 58 per cent of 500 private cases, exclusive of those referred for treatment of vomiting.

In 12.1 per cent of the women there was evidence of mild toxemia in the presence of a slight amount of albumin or of hypertension; in 5 per cent there was moderate and in 1.2 per cent severe toxemia. There was one case of intrapartum eclampsia.

Syphilis complicated pregnancy in six instances. In two of these it was unrecognized until the delivery of a macerated child. In one the Wassermann reaction was negative, while the other occurred before the days of the Wassermann test. Both placentas were syphilitic. One patient with a triple plus Wassermann reaction, untreated because she reported for the first time just before delivery, had a syphilitic placenta and a syphilitic child. Three patients who were treated

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1. Spain, Kate: Childbirth in Elderly Primipara, Am. J. Obst. & Gynec. **65**: 421, 1912.
2. Freeland, J. R.: Labor in Elderly Primipara, Am. J. Obst. & Gynec. **71**: 306, 1915.
3. Cohnstein: Zur Kenntniss alter Erstgebärender, Arch. f. Gynäk. **4**: 499, 1872.
4. Ahlfeld: Die Geburten älterer Erstgeschwängerten, Arch. f. Gynäk. **4**: 510, 1872.
5. Quoted by Varnier (footnote 6).
6. Varnier, H.: Obstétrique journalière, 1900.
7. Meyer, Leopold: Les primipares agées, Arch. mens. d'obst. et de gynéc. **8**: 264, 1916.
8. Jaroschka, K.: Über den Verlauf der Erstgeburt im höheren Lebensalter, Med. Klin. **22**: 448 (March 19) 1926.
9. Fassbaender, quoted by Jaroschka (footnote 8).
10. Lynch, F. W.: Treatment of the Severe Vomitings of Early Pregnancy, J. A. M. A. **73**: 488 (Aug. 18) 1919.

during pregnancy had normal placentas and apparently normal children.

Children.—There were 342 children including five pairs of twins, of whom 162 were male and 180 female, a proportion of 90 to 100. The literature in general reports a large preponderance of male children, varying from Steinmann's [11] figures of 107 males to 100 females to Ahlfeld's of 137 to 100.

The average weight of the children was 3,248 Gm.; 6.9 per cent were over 4,000 Gm. This is somewhat below the average birth weight of 2,100 consecutive infants in our clinic, which was 3,478 Gm.

Since there is such a marked variability in the prognosis of labor in these cases, the very easy labors and the dystocias have been studied particularly, in an attempt to determine the factors that have most bearing on their incidence. Since it is obvious that the number of cesarean sections in each group may have much influence on the relative proportion of easy and difficult labors, these are considered also. Eighteen hours is given by Williams as the average duration of a primiparous labor, and the standards of most of the other authorities are slightly above this. I therefore feel that a primiparous labor completed spontaneously in less than half this time could certainly be considered easy and I have so classified all labors completed within nine hours. I have classified as dystocias all labors giving serious concern because of their excessive length or their termination in maternal exhaustion, as well as all those in which operative procedures of greater importance than low forceps delivery became necessary. The influence of each factor on maternal and fetal mortality is considered also.

Prognosis.—In the total series of 337 cases, there were 10.3 per cent cesarean operations, 19.2 per cent very easy labors and 14.8 per cent dystocias. The fetal mortality was 7 per cent. The maternal mortality was 0.29 per cent—one patient on whom cesarean section was performed.

Aside from malpresentations and contracted pelves, which will be considered in detail, the complications of labor were remarkably few. There was no placenta praevia. There were two premature separations of the placenta, one delivered by rapid spontaneous labor and the other by cesarean section. Both mothers and both children survived. There were three cases of prolapse of the cord; two of the children were saved by rapid delivery. There was one intrapartum eclampsia.

Duration of Labor.—The average duration of labor was only slightly longer than the average given by Williams for primiparous labor. The average length of the first stage was 16.5 hours and of the second stage 2.1 hours.

Type of Delivery.—Of the 302 cases of vaginal delivery, 177, or 58.6 per cent, were spontaneous. Thirty-five cases required assistance in the first stage. There were twenty-eight manual dilations, four cases of incision of the cervix and three cases in which a Voorhees bag was used to aid dilatation. In practically all of these cases, the difficulty was due to poor pains, although in a few cases of cephalicopelvic disproportion with premature rupture of membranes the head remained too high to come through and completely efface the cervix in spite of good pains. There were seventy-four cases in which excessive length of the first stage caused a prolongation of the whole labor to more than twenty-four hours. In thirty-six of these the pains were vague and infrequent for a considerable number of hours; then they became good and labor was completed promptly. In thirty cases the pains were inadequate throughout, while in only seven were they good; in four of these there was disproportion. I should therefore be inclined to agree with Spain that the large majority of cases of so-called rigidity of the cervix were due to poor pains rather than to abnormal resistance of the cervix itself.

Operative Procedures.—There were 121 operative deliveries, or 40 per cent; of these, sixty-one were low forceps, thirty-two midforceps and six high forceps. There were eighteen breech extractions, three versions and extractions and one craniotomy.

Third Stage.—The average amount of bleeding in the third stage was 300 cc. There were twenty-one, or 6.9 per cent, postpartum hemorrhages in which the average loss of blood was 700 cc. There were three serious hemorrhages (1,000 cc.), or 1 per cent. Manual removal of the placenta was necessary in six cases.

Maternal Morbidity.—The total morbidity, including all patients who had a temperature over 38 C. (100.4 F.) even once was very high—94 cases, or 27.8 per cent. Eliminating the cases in which uterine cultures were sterile or those in which the fever was clearly due to mastitis, pyelitis or other extrapelvic cause, the corrected morbidity was seventy-one cases, or 21 per cent, which is still much higher than the corrected morbidity of 12.8 per cent in our first 6,500 consecutive deliveries. On closer analysis of the series, however, this high morbidity may be partly explained by the large number of cesarean sections, as in twenty of the thirty-five cases of cesarean section, or 57.1 per cent, there was some febrile reaction. Normal cases showed 13.5 per cent morbidity, and other operative procedures than cesarean 20 per cent. In thirty-eight cases, or 11.2 per cent of the total, there was fever for more than one day; the average number of days of fever was 2.9. Only three patients had fever lasting over seven days: eleven, fourteen and twenty-six days, respectively. All three had cesarean sections. The twenty-six day morbidity was due to a thrombophlebitis of the left femoral vein in a woman who had had a similar condition following an operation on the gallbladder a year previously and who had had trouble with the leg ever since.

Seventeen patients had a temperature of 38 C. or more during labor; eight of these had a febrile puerperium also. Only one of the seventeen showed an inflammatory reaction on microscopic examination of the cord. Only six cases in the whole series, or 2.4 per cent of the 248 cases in which the cord was examined microscopically, showed an omphalitis, a rather surprising fact in view of the high percentage of dry labors and operative deliveries.

Fetal Mortality.—The fetal mortality in this series was twenty-four, or 7 per cent of the 342 children, including stillbirths and deaths in the first two weeks of life. This is almost exactly comparable to Williams' [12] rate of 7 per cent in 10,000 deliveries of viable children (over 1,500 Gm.) at Johns Hopkins Hospital and to Holt's [13] rate of 7.2 per cent in a similar series

11. Steinmann: Geburt und Wochenbett älterer Erstgebärender, Arch. f. Gynäk. **22**: 475, 1883.

12. Williams, J. W.: Obstetrics, New York, D. Appleton & Company. The Limitations and Possibilities of Prenatal Care, J. A. M. A. **64**: 95 (Jan. 9) 1915.

13. Holt: Institutional Mortality of the New-Born, J. A. M. A. **64**: 287 (Jan. 23) 1915.

from Sloane and would indicate that the fetal risk in labors of elderly primiparas had been exaggerated. However, the death rate at birth and in the first twelve hours following was 6.1, a figure considerably higher than McQuarrie's [14] mortality of 3.6 in a comparable period in the first 2,700 cases in this clinic.

There were nineteen stillbirths, or 5.5 per cent, and five deaths, or 1.5 per cent, in the first two weeks. Among the stillbirths one child was an anencephalic monster, two were macerated syphilitic infants and one macerated in a severe preclamptic toxemia. Among the deaths after birth, one child weighing 1,800 Gm. died on the fourth day of prematurity, and another on the thirteenth day of pneumonia. Thus, only eighteen of the deaths could be related in any way to the type of labor.

In twelve cases the death could be definitely attributed to birth trauma. Ten of these were difficult operative deliveries, in one there was prolapse of the cord, and in another death was attributed to pressure on the cord, which was wrapped many times about the neck, feet and arms. In six cases the cause of death was not entirely evident; two infants died during a rather prolonged first stage, and one near the beginning of the second stage. One was stillborn after a short and easy labor and the postmortem examination was negative. In two others, one which died one hour after a cesarean section and one which died forty-eight hours after labor, no anatomic lesions sufficient to account for death could be found, but as both women had had long difficult labors, the labor was probably accountable.

Lacerations.—The older authorities were much concerned with the question of lacerations, and the greater frequency of these in elderly primiparas is emphasized in most of the older papers. I feel that a properly repaired perineal wound is of much less damage to the patient than the relaxation which so often follows attempts to prevent laceration. Therefore, a median episiotomy for some time has been a routine in first labors. One hundred and forty-three patients had episiotomies; of these 108 were median, twelve mediolateral and twenty-three lateral. Of 159 patients delivered vaginally without episiotomy, twenty had no lacerations and fifty-eight had first degree, seventy-six second degree and five third degree lacerations. In eight of the episiotomy cases, the wound extended and a third degree laceration resulted. Only three of the third degree tears occurred in nonoperative deliveries. Of the third degree lacerations, eight healed primarily; in two a rectovaginal fistula developed and in one a rectoperineal fistula which healed spontaneously. In one patient a rectovaginal fistula developed which did not heal and which was repaired successfully a year later. Another was not healed when the patient was discharged from the hospital, but she did not return for reexamination.

There were nine cervical lacerations of sufficient degree to necessitate repair: All but two occurred in operative deliveries; in five of these, urgent indications had demanded delivery before the cervix was completely dilated, and completion of dilatation manually had therefore preceded the operative termination. In four other cases of this type, the cervix was incised before operative delivery and later was repaired.

Castor Oil and Quinine.—Castor oil and quinine was given to induce labor in thirty-nine cases. It was successful in twenty-six cases, or 66.6 per cent; in five of these it was supplemented with from one to six doses of solution of pituitary. In one successful case, a previous attempt had been unsuccessful. In one of the thirteen unsuccessful cases six doses of solution of pituitary had been given without result. Five patients had had two, one three, and one four unsuccessful attempts at induction. Three of these had later had labor induced by Voorhees bags; the others went into labor spontaneously. The average length of the labors induced by quinine and castor oil was 17.6 hours, slightly less than the general average.

Quinine and castor oil was given in the early part of labor in eleven cases when pains had been present for some hours but were vague and indefinite; it was followed by the prompt appearance of good pains and a satisfactory termination in a comparatively short time. In one of these cases a bag had been inserted to induce labor, but pains did not appear until after the medication. In three cases castor oil alone and in two quinine alone, was followed by good pains and a normal labor. In one labor induced by bags in a twin pregnancy, because of toxemia, pains were very poor and were not improved by quinine and castor oil, or by small doses of solution of pituitary. Dilation was finally accomplished but, after the expulsion of the bag, labor ceased entirely and delivery was effected by version and extraction. In two other cases of labor with poor pains there was no improvement with quinine and castor oil. One of these was delivered with midforceps and the other by a cervical cesarean section. In three cases quinine alone given during the first stage had little influence in stimulating poor pains.

My experience, then, would lead me to believe that quinine and castor oil had a definite value in stimulating pains, as in 72.7 per cent of the cases in which it was given prompt improvement followed, although of course it is impossible to prove that labor might not have gained momentum without it.

There has been so much discussion in recent literature of the possibility of fetal death due to quinine that the question of its danger to the child cannot be ignored. In only four of the cases of fetal death had quinine been given at the beginning of labor or during it, and all of these were difficult labors with poor pains. One ended in craniotomy and two in difficult forceps operations; in all of these the death was clearly due to birth trauma. The fourth was a patient with a flat pelvis who was given a test of labor. After forty-seven hours of poor pains, which were not improved by quinine and castor oil, she was delivered by a cervical cesarean section. The child died an hour after birth. Postmortem examination showed atelectasis, a patent foramen ovale and a patent ductus arteriosus. These lesions were not considered sufficient to have caused the death and the possible etiologic importance of the quinine was discussed. The case seems dubious, to say the least.

Solution of Pituitary.—The use of solution of pituitary during labor before the delivery of the child is definitely ruled against in this clinic. Its use is recorded in only four cases in this series: the aforementioned case in which the bag was employed, when it was entirely ineffective, another case of the same kind in which irregular and inefficient pains were slightly better after solution of pituitary was given, and a third case in which 3 minims (0.18 cc.) of solution of pituitary given after the head was in sight resulted in prompt improvement of the pains and in rapid delivery. In

14. McQuarrie: Fetal Death, J. A. M. A. **73**: 1574 (Nov. 22) 1919.

all these cases relatively small doses were used, not more than from 3 to 5 minims (0.3 cc.). In one early case, before the dangers of solution of pituitary were fully realized, two doses of 1 cc. each were given in a case with ineffectual pains. The pains increased in intensity but there was no progress and low forceps delivery was necessary.

Voorhees Bags.—Bags were used relatively infrequently in this series. There were ten cases. In four cases, labor was induced because of toxemia. In two of these, castor oil and quinine had failed twice. In a third it was given after the bag was inserted because pains had not resulted. In these three, delivery occurred without difficulty. The fourth was the case of twins described, in which very poor pains did not improve although castor oil, quinine and solution of pituitary were given, and in which version and extraction were necessary. In one case, labor was induced because of premature rupture of the membranes. Delivery was uneventful. In two cases, labor was induced because of postmaturity. In each of these, castor oil and quinine had failed. In one, a fairly normal labor was terminated by low forceps delivery. In the other, pains were very poor and little improved by small doses of solution of pituitary, and delivery by a very difficult breech extraction was finally necessary because of maternal exhaustion. The child was stillborn. In three cases bags were inserted during the course of a prolonged labor because of slow dilatation and poor pains. In two cases dilatation progressed slowly; one patient delivered normally, the other required midforceps delivery because of insufficient vis a tergo. In the other the bag did not entirely complete dilatation, and after its expulsion the cervix contracted down again. Maternal exhaustion necessitated completion of the dilation manually and high forceps delivery. The child died an hour post partum.

TABLE 1.—*Influence of Age on Type of Delivery*

	30-35 Years, Inclusive, Per Cent	35-40 Years, Inclusive, Per Cent	40-45 Years, Inclusive, Per Cent
Cesarean section	6.9	14.1	33.3
Easy labors	20.4	21.9	35.7
Dystocia	14.3	23.2	14.2
Fetal mortality	5.1	8.0	0.45
Maternal mortality	0.4	0	0

FACTORS IN PROGNOSIS

Age.—The next consideration is the influence of various factors on prognosis. I shall first consider age.

Table 1 shows that although the incidence of cesarean sections in the group 35 to 40 years of age was double that in the women aged 30 to 35, the proportion of very easy labors was practically the same in the two groups, while the proportion of dystocias was very considerably increased in the older women and the fetal mortality was also higher.

In the women of 40 or over, a very high incidence of cesarean section apparently eliminated a great deal of expected difficulty, for the percentage of easy labors was almost double that of either of the other groups, the number of dystocias practically the same as that in the youngest group, and fetal mortality practically eliminated.

Type of Pains.—Since forceful pains are a necessity for successful labor, a consideration of the quality of the uterine contractions is of paramount importance. They were good throughout labor in 168 cases, or in 55.5 per cent of the elderly primiparas. In 20.8 per cent they were vague in early labor but later good. In 4.6 per cent good pains began but secondary inertia developed. In 5.6 per cent the pains were fair and in 13.5 per cent poor; that is, 23.7 per cent of the women had inadequate pains, and the proportion increased regularly with advancing age. In the younger women the percentage was 20.9 in the group aged 35 to 40, 28.7 per cent, while in those of 40 or over it was 35.7 per cent. There was little difference between the women who had had their first baby within a year of marriage and those who had been sterile for five or more years; 27.4 and 29.5 per cent, respectively. Though one might expect a greater proportion of the women who develop late to have uterine inertia, the percentage of those who had their first menstruation after 17 was practically the same as that of the total series (23.2 per cent).

The influence of inadequate pains on the prognosis of labor was most striking. There were seventy-two cases, with one cesarean section after a long test of labor. The easy labors were 6.9 per cent, the difficult labors 38.8 per cent and the fetal mortality 20.8 per cent, which was mainly due, of course, to difficult operative deliveries. There was no maternal mortality.

Previous Sterility.—I was much interested in the theory of Leopold Meyer, which he offered not as a proved fact but as a theory based on considerable observation and mature reflection, and which he wished his colleagues to put to the proof. He felt that the elderly primiparas should be divided into two classes: normal women who did not become pregnant until relatively late because of lack of opportunity, either because of late marriage or because of the use of contraceptive measures. These are the women who have the easy labors that seem so surprising and in them one need anticipate no greater difficulty than in a younger woman. On the other hand, the women who in spite of opportunity are sterile over a period of years because of hypoplasia of the genital organs form the classic type of the elderly primipara and show the effect of this hypoplasia in the character of their labors—ineffective pains and difficulty in cervical dilatation—a narrow vagina and a tight perineum offering difficulties in the perineal stage.

TABLE 2.—*Type of Delivery in First Labor*

	1 Year After Marriage, Per Cent	5 or More Years, Per Cent
Cesarean section	6.0	21.4
Easy labors	29.0	18.2
Dystocia	17.7	20.4
Fetal mortality	8.9	5.2
Maternal mortality	0	0

Accordingly, I have selected from the series the women who have had their first child within a year after marriage and the women who have not had a child until five or more years after marriage. Table 2 compares the types of deliveries.

The second group probably includes some normal women with voluntary sterility or who have not had children because of relative sterility of their husbands. Nevertheless, in spite of the fact that there were three and one-half times as many cesarean sections, the easy labors were much less frequent and the dystocias slightly more frequent than in the group who became

pregnant immediately. The fact that the fetal mortality is less in this group is undoubtedly the result of the high percentage of cesarean sections, for most of the women who have long been sterile are willing to assume a slightly increased risk themselves to assure the safety of their children.

From the standpoint of the possibility of genital hypoplasia also, the women have been considered whose menstruation was late in beginning. There were forty-three women in whom menstruation began at 17 years or later, while in an unselected similar series of obstetric patients only nineteen had begun so late. Their deliveries, however, were rather surprising and contrary to what was expected. None of the patients required cesarean section, 30.2 per cent had easy labors, only 11.6 per cent had dystocias, and the fetal mortality was the same as in the total series.

Physical Type.—A consideration of physical type would be of importance. All obstetricians recognize the two types described by Jaroschka who are particularly prone to have inefficient pains with resulting dystocia: the woman with marked obesity, sparse pubic hair, a short thick neck, short fat thighs and large breasts with little parenchyma; and an asthenic type with delicate bones, pale coloring, poor nutrition and poorly developed body musculature. Unfortunately, clinical obstetric records rarely include a sufficiently accurate description of the physical type of the patient to permit of statistical study on this point. The cases have been studied, however, in which definite note of conditions suggesting endocrine dyscrasia were made or in which marked obesity suggested that it might be present. There were forty-three such women, of whom 6.9 per cent had cesarean sections, 23.2 per cent very easy labors and 23.2 per cent dystocia, and there was 9.2 per cent fetal mortality. Of nine notably tall and slim women, one had a cesarean section, two had very easy labors, none had dystocia and none lost their babies.

TABLE 3.—*Abnormal Presentations*

	Seventy-Seven Occipitoposterior, Per Cent	Eighteen Breech, Per Cent
Cesarean section	16.8	5.5
Easy labors	15.6	11.7
Dystocia	39.2	23.5
Fetal mortality	7.7	16.6
Maternal mortality	1.3	0

Presentations.—I shall now consider the prognosis in various presentations of the child. The present study shows that occipito-anterior presentation occurred in 70.7 per cent of cases, occipitoposterior in 22.5 per cent, breech in 5.2 per cent, face in 0.6 per cent, and transverse in 0.3 per cent. In the remaining 0.6 per cent, which were cesarean sections, the presentation was not stated.

In 191 cases in which the head was engaged in a normal pelvis in occipito-anterior positions, there were 24.3 per cent easy labors, 5.8 per cent dystocias and 4.1 per cent fetal mortality. Of the dystocias, 75 per cent were due to uterine inertia; in other words, when there are normal relationships between mother and child, and good pains, the probability of difficulty in the elderly primipara is reduced to an almost negligible minimum.

With abnormal presentations, however, there is a different situation. Table 3 shows the results in occipitoposterior and breech presentations. The percentage of dystocia is very high in occipito posterior presentations, and in the breech deliveries the fetal mortality is considerable.

A consideration of the patients who entered labor with an unengaged head shows again that this must be considered as a definite danger signal. Many of the cases were, of course, due to disproportion or malpresentation and the difficulties were due to these complications. In spite of 36.8 per cent cesarean sections, however, there were 44.4 per cent dystocias, only 11.1 per cent easy labors, 27.7 per cent fetal mortality and 1.7 per cent maternal mortality.

Contracted Pelves.—Practically all authorities emphasize the greater frequency of contracted pelvis in the elderly primipara. This series included twenty-nine cases, an incidence of 8.6 per cent—which is more than twice as great as the average incidence of 3.9 per cent in this clinic reported by Maxwell.[15] There was not found, however, a progressive increase with age as noted by Jaroschka and other authorities, for while the group aged 30 to 35 showed 8.2 per cent and that aged 35 to 40 showed 10.6 per cent, the women of 40 or over had only 4.9 per cent of contracted pelvis.

The frequency of the various types of contracted pelvis is as follows: generally contracted eleven, or 37.9 per cent; simple flat five, or 17.2 per cent; funnel five, or 17.2 per cent; rachitic four, or 13.8 per cent, and asymmetrical four, or 13.8 per cent. It is interesting to note that the incidence of the two types usually associated with visible deformities is almost twice as great as that found by Maxwell.

The results in the contracted pelves were extremely poor. Although eleven patients, or 37.7 per cent, were delivered by elective cesarean section, in nine, or 50 per cent, of the eighteen that were allowed to go into labor serious dystocia developed. One of these patients was delivered by cervical cesarean section, four by high forceps and one by craniotomy. Only one had an easy labor. The fetal mortality was 16.6 per cent; in the patients delivered vaginally, it was 22 per cent. There was no maternal mortality.

Dry Labor.—The subject of dry labor has long been of interest to me. In a study of the subject some time ago,[16] I felt that age was not of particular importance in the etiology. This now seems to have been an error, probably due largely to the comparatively small proportion of cases in older women, for it is now found that 21.6 per cent of primiparas over 30 begin labor with ruptured membranes while the former study showed that only 12.34 per cent of all primiparas had dry labors. As in general, so in elderly primiparas, dry labor does not deserve the gloomy prognosis so long associated with it. There were seventy-one dry labors, with 2.8 per cent cesarean sections, 34.7 per cent easy labors, 10.1 per cent dystocias and 5.5 per cent fetal mortality. Incidentally, the average length of the first stage in dry labor in elderly primiparas was 12.1 hours, which was more than four hours shorter than the average length, while the duration of the second stage was unchanged.

Size of Child.—A consideration of the over-large child shows that cesarean sections were necessary in 17.3 per cent of the twenty-three cases in which the child weighed over 4,000 Gm. There were 22.2 per

15. Maxwell, Alice F.: A Study of Labor in Contracted Pelves, J. A. M. A. **89**: 2088 (Dec. 17) 1927.
16. Schulze, Margaret: Dry Labor, Am. J. Obst. & Gynec. **17**: 20 (Jan.) 1929.

cent easy labors, 22.2 dystocias and 4.3 per cent fetal mortality. There was no maternal mortality.

Cesarean Section.—There were thirty-five cesarean sections, an incidence of 10.3 per cent. Of these patients, eighteen would undoubtedly have been delivered in this way regardless of age; in the other seventeen the age was at least an important complicating factor in the choice. Eleven patients had a contracted pelvis; three of these had toxemia also, and one case was complicated by cardiac decompensation. In two patients the necessity for rapid delivery because of rapidly increasing toxemia was the primary indication; one of these had a breech presentation, the other an unengaged head in right occipitoposterior presentation. One patient had a premature separation of the placenta, one had previously had a myomectomy and now had a large child in right occipitoposterior presentation, while another had a large baby with an unengaged head plus a large ventral hernia through an old appendectomy scar.

Of the seventeen patients whose age was at least one important factor in the choice of a cesarean section, seven had an unengaged head in an occipitoposterior position, one case being complicated by extreme obesity and a mild toxemia; and four patients had had previously sterile marriages, lasting five, eight, twelve and twenty-three years, respectively. Five had an unengaged head in occipito-anterior position; four of these patients had been sterile for four, seven, ten and thirteen years, respectively. In the five remaining patients, age or a long-standing period of sterility alone were considered sufficient indication.

In the presence of not entirely clear-cut indications, four of the patients undergoing cesarean section had been allowed to go into labor. In three of these, after five, nine and ten hours, respectively, of fairly good pains there was no dilatation of the cervix and a cesarean section was performed. One woman with a flat pelvis was delivered by a cervical cesarean section after forty-seven hours of poor pains. Her child died an hour post partum. There was one other fetal death in the series of cesarean sections, one from pneumonia thirteen days post partum.

Twenty-eight of the cesarean sections were classic and seven were cervical. In twenty of the cesarean sections, the patient had a temperature of more than 38 C. at least once, a maternal morbidity of 57.1 per cent. The maternal mortality was 1, or 2.8 per cent, a patient who had a classic cesarean section and who died on the third day post partum of paralytic ileus and acute cardiac dilatation.

In fourteen of the thirty-five cases of cesarean section, uterine fibromyomas were noticed at operation, varying from the size of a pea to 4 or 5 cm. in diameter. In all but one case, in which the operation was performed twenty years ago, the tumors were shelled out. In practically all these cases the tumors were too small to have been noted clinically, and in the 302 cases of vaginal delivery there were noted only six myomas, the largest of which was the size of an orange. This patient was 38 years of age and had a hysterectomy a year later, by which time the tumor had decreased in diameter to 4 cm.

CONCLUSIONS

The dangers and difficulties of labor in elderly primiparas have been somewhat exaggerated.

Speaking generally, neither fetal nor maternal mortality is increased above levels generally accepted as normal and the average duration of labor is only slightly prolonged. About 20 per cent of the women have strikingly rapid and easy labors.

Dystocia may be expected in about 15 per cent of the cases but is usually dependent on complicating factors rather than on age alone. A careful consideration of the patient will usually enable one to make a fairly accurate prognosis even before labor starts. Abnormal presentations and contracted pelves, both of which are more frequent than in younger patients, increase the necessity for operative intervention and with it the danger to both mother and child. A woman beginning labor with the head engaged in a normal pelvis in an occipito-anterior presentation has little likelihood of difficulty. If she has good pains, her likelihood of having dystocia is almost negligible.

The most important single factor in prognosis, however, is the quality of the uterine contractions, and this unfortunately cannot be accurately prognosticated until after labor has set in. It is known that the frequency of inadequate pains increases with advancing age and it is probable that a consideration of the physical type of the patient and of her history, such as that of a previous long-standing sterility, will be of greater importance the more accurately it is observed.

Fortunately, however, the development of the cervical cesarean section in recent years makes it possible, without materially increasing the risk to the mother, to await labor, observe the type of uterine contractions and then, if these seem insufficient to carry the patient through successfully, perform cesarean section. A rather high percentage of cesarean sections will probably always be necessary, especially in the older women and in those with previous long-standing sterility, for the greatly increased value of the child in these cases makes it desirable to minimize fetal risk.

ABSTRACT OF DISCUSSION

DR. THEODORE W. ADAMS, Portland, Ore.: Dr. Schulze reminds us that folklore and superstition have not been completely eradicated from modern scientific medicine. If this paper does nothing else than allay, to some extent, the exaggerated fears of labor in elderly primiparas, it has served a worthy purpose. Dr. Schulze stated that the cause of the dystocia in the majority of these cases lies in an inability on the part of the uterus to dilate the cervix. Whether this is due to a failure in the uterine contraction or to an increased rigidity or resistance on the part of the cervix is difficult to determine. My own feeling is that both factors probably enter into the question, for there is no reason to feel that advancing age and its associated pathologic changes are any more apt to cause a lessening of the contractibility of the fundus than to cause a lessening of the elasticity of the cervix. In my own experience, the use of a hydrostatic bag in this type of case has been somewhat more valuable than was brought out by Dr. Schulze. However, I would not wish to be misunderstood, because I am cognizant of the dangers of hydrostatic bags, and I feel, therefore, that they should be used only in selected cases.

DR. E. D. PLASS, Iowa City: Our experience with labor in elderly primiparas has been very largely the same as Dr. Schulze's, both in clinic practice and among private patients. In order to present some figures from private practice, I have analyzed 619 primiparous labors. Private patients are more likely to begin childbearing later than clinic patients, so that the number of elderly primiparas is greater. Our series shows 163 (26.3 per cent) women over 30 years of age. We believe, however, that up to about 35 years, age has relatively little effect on labor, and consequently we have divided our series at 35, indicating as elderly only those women over that age.

There were fifty-five (8.9 per cent) women in this group. By arranging our data to show the percentage of labors ending in certain three-hour periods, we find that the graphs for young and elderly primiparas agree very closely, except that the number of prolonged labors (over thirty-six hours in duration) is twice as great in the latter group (10 per cent as against 5 per cent). Among the fifty-five primiparas over 35, thirty-five had spontaneous labors, thirteen were delivered by low forceps, two by mid forceps, one by high forceps, two by breech extraction, and two by cesarean section. The abdominal deliveries were indicated by the presence of uterine fibroids. The uncorrected fetal mortality was four (7.3 per cent). In only one instance, a forceps delivery with intracranial hemorrhage, did we feel that the death of the child could in any way be connected with the age of the mother.

DR. JOHN O. POLAK, Brooklyn: Dr. Schulze has upset the idea of the elderly primipara having a big baby. I think her average is somewhere around 3,200 Gm. That removes the bugbear that has stood out before the profession for a number of years. Another fact worth noting is that she has shown a high fetal mortality even when cesarean section has been done in the interest of the child, which brings out the point that it is the stress of labor, prolonged labor, that affects the child no matter what method of delivery, and justifies us, in these old primiparas, in not waiting until we have had a final test. If we are operating in the interest of the child, we should do it as an elective procedure. Another important result of this study is that dry labor is not such a serious matter. It does not need bags. Most of these dry labors have a spontaneous termination. They have prepared the soft parts before labor actually takes place. Another interesting point with which we are all familiar is that the dystocia in these cases is due to the inadequate contractions of the uterus. As these women grow older, it is surprising how we meet this inadequate uterine contraction. How to handle this condition I do not know; I am also ignorant of its cause. I had supposed, from investigating a large number of these cases, that there was nothing to the fibroid risk. Dr. Lynch in his paper will show that there is nothing to it. Yet Fitzgibbon has shown that such is not the fact in his experience at the Rotunda Hospital.

DR. ISAIAH SICOTTE, Michigamme, Mich.: I should like to know how frequently tears of the cervix and the perineum occur in elderly primiparas.

DR. MARGARET SCHULZE, San Francisco: The question of whether there is a true rigidity of the cervix in the elderly primiparas who have first stage dystocia is one that has agitated practically all observers. Most authorities have felt that there is. My study showed that nearly all of the women who had prolonged first stages had inadequate pains. In many of the cases dilatation began very slowly, and one might have felt that one was dealing with a rigid cervix; yet later the patient would develop good pains and complete labor normally and rapidly. I feel, therefore, that the majority of cases of so-called rigidity of the cervix were due to poor pains, rather than to abnormal resistance of the cervix itself. In our clinic, we feel that a perineal laceration is of far less importance than the relaxation which may follow the attempt to prevent one. A median episiotomy, therefore, has long been a routine. Occasionally, of course, particularly in operative cases, such an episiotomy may extend to form a third degree laceration. In the few cases in which this unfortunate accident occurred, we had little difficulty in healing the repair. In only a small proportion of cases were there cervical lacerations of sufficient extent to require repair, but routine inspection of the cervix has been done only in the last few years. I agree with Dr. Plass that 30 is rather young to label a woman an elderly primipara, yet most of the discussions in the literature take this age as the standard, and we felt that it would allow comparison with other statistics if we accepted it. Of great interest, I feel, is the probability that the women who have difficulty as elderly primiparas include a large proportion of those who would have had difficulties no matter when they happened to have their babies. These women have hypoplastic uteri; they often remain sterile for a period of years, and then, if they do become pregnant, show the hypoplasia in inefficient contractions at the time of labor.