The method and formula for spinal anaesthesia is that of Dr. W. Wayne Babcock:—

\[
\begin{align*}
\text{Stovaine} & \quad 0.08 \\
\text{Lactic Acid} & \quad 0.02 \\
\text{Ethyl Alcohol} & \quad 0.2 \\
\text{Aq. dist. q.s.} & \quad 2 \text{ mils}
\end{align*}
\]

The injection is made in the first or second lumbar inter-space, with the withdrawal and re-injection of a small amount of spinal fluid.

Results have amply warranted our confidence in the combined method.

THE EVALUATION OF METHODS IN OBSTETRICAL ANALGESIA AND ANÆSTHESIA: WITH SPECIAL REFERENCE TO GAS-OXYGEN.

By Carl Henry Davis, M.D., F.A.C.S., Milwaukee.

SUMMARY.

The woman in labour is entitled to the maximum relief of pain which is possible without sacrificing safety. With methods now in use there is no longer any excuse for the old-time sound-proof crying room and the delivery room is no longer a chamber of horrors. Formerly the out-cries of obstetrical patients made the nights hideous for everyone in a hospital, but to-day most women may be carried through labour with few moans and no out-cries. Attention to pain relief does not require more nursing or medical attention than is necessary for the safe conduct of labour.

The obstetrician must be familiar with all methods of pain relief and adapt them to the needs of the patient during the different stages of labour. Standardization is impracticable except in so far as a general plan may be followed. The writer has experimented with most methods of pain relief and as the result of animal experiments and clinical experience has adopted the following plan for his private patients.

First stage pain is relieved by hypodermic medication, occasionally supplemented by colonic ether-oil. Heroin grs. 1/12 or pantopon grs. 1/3 and hyoscin grs. 1/100 is prepared
in the syringe. The patient is told that she may have a hypo-
dermic at any time she may wish it because of painful con-
tractions. When she begins to complain a rectal examination is made to determine the degree of dilatation. If early in labour with little dilatation, pains moderate and contractions short, only half of the dose is injected, the rest being given when needed. A severe labour requires the full dose at one time. Colonic ether-oil is limited to the patients who have a tetanic type of contraction or an unusually painful first stage with slow dilatation of the cervix. Ether-oil is contraindicated if the patient has kidney disease or a history of an irritable colon or colitis. In long labours additional hypodermic medication is frequently needed, and reduced doses such as heroin grs. 1/24 or pantopon grs. 1/6, and hyoscin grs. 1/300 may be administered. An attempt is made to avoid hypodermic medication during the last two hours of labour. Hypodermic medication may also be used during the night to give sleep to patients who may not have much pain but who are being kept awake by the constantly recurring uterine contractions. This tends to conserve strength and lessens the tendency to exhaustion late in labour.

Near the end of the first stage or early in the second stage of labour the patient is taken to the delivery room and inter-
mittent gas-oxygen analgesia used as needed to control pain. Many patients only require gas for a few minutes during the perineal stage. Either nitrous oxid-oxygen or ethylene-oxygen may be used. For the second stage analgesia ethyl-
ene appears to have some advantages over nitrous oxide. It is the more powerful anaesthetic and may be administered with a higher percentage of oxygen. Both gases undoubtedly reduce the oxygen carrying power of the blood. During the past two years 580 patients at Columbia Hospital have had ethylene-oxygen for delivery. The average time of adminis-
tration was 63 minutes and the average cost to the patient $12.00 (£2 8s 6d).

Gas oxygen is satisfactory for most operative deliveries except those requiring a considerable degree of relaxation, such as version. For these ether may be added to the mixture but it is rarely needed when ethylene-oxygen is employed.
Cæsarean section may be performed with local anaesthesia, combined anaesthesia or with ethylene-oxygen. Caudal anaesthesia or sacral nerve block is advised for severe pulmonary, cardiac and renal complications, with or without toxæmia.

**DISCUSSION**

**Dr. Long:** It has been said there are four generally accepted methods of analgesia; three of them have been covered in this afternoon’s symposium. The one left untouched in this series is the latter-day morphine semi-narcosis. If that newspaper campaign on twilight sleep some fifteen or sixteen years ago, carried on in the modern up-to-date style, was permitted, and it is generally agreed it was, it had one good later effect. It got the women to demand some sort of relief and put the obstetricians on their toes to help find it. It is absolutely true that the field of progress made in the field of obstetrical analgesia can be referred back to that popular magazine called *Twilight Sleep*. It was read by every woman in the United States. Anaesthetists and obstetricians working together on this subject have accomplished a good deal. There is a field for each of these techniques and we should select that one most adaptable to the case in hand at the time. Naturally, I see more of the results of ethylene analgesia than any other kind. I am especially fond of watching the effect of gas analgesia. I am impressed with the nicety and accuracy with which you can control the expulsive stage. Permitting of that ideal of modern anaesthesia and the delivery of the head I have, with ethylene particularly, held patients at the place where one more pain would certainly deliver the head, for 25 or 30 minutes, not permitting that last pain to occur. Some maintain there is danger to the child in that delay. It is nice to know that nowadays, as Dr. Davis has said, there is no excuse for the outcry of the obstetrical patient. We should never hear it again. It ought to be a disgrace for anyone to hear the outcry of agony. There will always be some women who cannot get assistance, and some who won’t have assistance, but those who do call for assistance should, in this day and age, be able to be free from pain.

**Dr. Harding:** Generally using ethylene and air, I give 25 per cent. ethylene and 75 per cent. air. I think Dr. Clark reported 2,500 cases in the Journal at a cost of about $1.00 a patient for gas. We use 25 per cent. ethylene and 75 per cent. of air, and we give that until the child’s head is down, if the obstetrician wants complete relaxation or the pain is abolished. The patients have no recollection of any pain whatever. They are not conscious of it but they have pain; they help themselves just as though they had no anaesthetic at all. We have used and given it in all cases of pulmonary tuberculosis. We happen to be located within a few miles of a tuberculosis...
sanitorium and such cases are referred to us. In obstetrics, however, they confine us to ethylene and we give it in all cases regardless of pulmonary findings, or kidney complications, with beautiful results. The patients are happy over the results and rather look forward to being confined afterwards.

Dr. Ruth: Referring to Dr. Oldham's paper, I have had probably one hundred such cases and I have noticed some marked reactions immediately after the injections. It has not been due to excessive toxicity of the solution; it has not been due to lack of care; but, nevertheless, we have had some marked reactions: one which I have seen more than any other has been the circulatory reaction, the patient being cold and clammy. In one instance, I remember a man in excellent health who, for a period of ten or fifteen minutes after injection had an absolute loss of orientation—he could not recognize anyone for ten or fifteen minutes. As regards the circulatory action in his case I have not been able to find anything to explain it. I would like to ask Dr. Oldham if he has had anything of that nature.

A Voice: Has Dr. Oldham found any danger of permanent loss of sleep? Has he had any indication of anything bordering on collapse following injection?

Dr. Noyes: I would like to ask Dr. Oldham about the position of the patient during the injection. I had an idea in most surgical cases an attempt was made to place the patient on the abdomen. In obstetrical cases that is a very uncomfortable position. We place them on the side. I was also wondering whether there was any effect on the bladder control; also if the percentage of forceps would be increased in these cases.

I want to ask Dr. Davis what percentage of gas oxygen for analgesia is considered to-day, the best mixture, or must that be varied from time to time, according to conditions. The question was asked about type of quinine used. During part of the time, in the earlier cases, I used quinine hydro-bromide and with that I naturally used more alkaloid; latterly, I used the quinine alkaloid. I talked with the pharmacist at the New York Lying-In Hospital and he said that the reports that he got from people doing work in the wards was that there was a greater amount of neuritis coming from the rectum within the next few days after the alkaloid quinine had been used. I gathered from what he said that the alkaloid was a little more irritating to the wall.

Dr. Oldham: The question was asked in regard to the effect of cocaine and quinine. I have never noticed any bad effect. I can see that in using a needle excessively long you may get some of the solution into the spinal fluid. I am always looking for blood pressure,—that is taken between the time of injection and the time
of the anaesthetic. Of course, it would be better to lay the patients on the abdomen, but sometimes I place them on the side; in that position it is easy to get into the small canal. Sometimes it is pretty hard to get into the small canal. Someone asked about the paralysis of the rectum. You may get that. However, it is only a matter of a few days duration and comes back to normal.

Dr. Astley: Inquiry has been made regarding the appearance of any indication of collapse. In the use of spinal anaesthetics there is reduction in blood pressure; because of this we use a fluid that is lighter than the cerebral. Because of the tendency of the fluid to float upward we promptly get our patient down on the table. The anaesthetist, as soon as he takes his needle out, must lower the patient in a head-low position. By getting our patient down promptly in these high pressure cases—the toxic cases—we haven’t seen a dangerous fall in blood pressure. Occasionally you will get an unusual fall in blood pressure. Occasionally the pressure may not be recorded and yet your patient is breathing perfectly freely.

Dr. Davis: Dr. Noyes asks regarding the percentage. I do not believe we should ever attempt to have a fixed percentage. We have to change that with the patient and with conditions as they develop. You may have a general percentage that you start out with, but you should always depend on conditions. Re the question regarding ethylene used in pulmonary-cardiac complications. I have personally had no experience with cardiac anaesthesia, but if I do, I will probably use oxygen as much as possible.

Dr. McMechan: On the subject of the use of gum glucose and gum in the treatment of shock, the observation was made that gum secured from different sources might produce rather a disagreeable reaction. I wanted to ask whether, in your experience, Dr. Driscoll, in using the gum glucose solution, you encountered any particular reaction due to the gum which you used?

Dr. Driscoll: We did not. We have been using a preparation made by Swift. We have had no bad results except in one case. The gum is given at the rate of every three or four minutes. We have had no bad effects but in this particular instance we had bad results but I do not think it was due to the action of the gum.

(Demonstration by Dr. Axlerod of Cleveland, Ohio, of apparatus for driving ethylene fumes from the operating room.)

Adjourned.

Tuesday, May 17, 1927, 8 p.m. Dinner-Dance at which Dr. Wm. Hamilton Long made address on “Putting Anaesthesia Across in Dixie.”