THE MORPHINE-HYOSCINE METHOD OF PAINLESS CHILDBIRTH.

OR SO-CALLED "TWILIGHT SLEEP."

BY

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LAST year a popular work, entitled *Painless Childbirth in Twilight Sleep*, was published by a lay author. In it a careful and excellent summary was given by various experts; it included also a somewhat amusing personal interview with a prominent British obstetrician, who not only gave the treatment unqualified commendation, but also in the form of a letter added a benediction to the value of the methods employed.

As is natural to expect with such testimony, the subject has been energetically exploited by women interested, who in some cases merely desire to know its real value, but in other instances uncompromisingly demand its adoption in their confinement. Having the Maternity Hospital clinic at our disposal, we felt we might be able to give an opinion from actual practical experience, and perhaps help others who are less fortunately placed in the way of gaining experience, but who are equally subjected to popular demands.

In the first instance, it should be clearly understood that there is a vast difference between the true so-called "twilight sleep," as devised and carried out by Kronig and Gauss, and the ordinary haphazard scopolamine-morphine treatment which has been freely practised by many of us for the last eight years. In the former a complete analgesia and amnesia is the object aimed at in the conduct of labour, so that the patient becomes absolutely free from any knowledge of pain, or indeed of any recollection of the process having occurred. It will be useful, therefore, first to give a brief outline of the technique.

As soon as the pains begin the patient is put in a quiet and darkened room, and plugs of cotton-wool are put in her ears. When the pains occur regularly every five or six minutes and the os is of a size sufficient to admit two fingers the initial dose is given. This consists in the hypodermic injection of morphine hydrochloride gr. $\frac{1}{4}$ with hyoscine hydrobromide gr. $\frac{1}{150}$. The patient usually rapidly begins to feel drowsy, and in an hour may fall off to sleep but awakes when the pains come on. The second injection of hyoscine gr. $\frac{1}{250}$, is usually given at the end of an hour. Half an hour later the patient's memory is tested by showing her some object and then allowing her to sleep. Sometime afterwards the same object is shown her again, the patient being awakened. If she recognizes the object as one that was shown her before, another dose of hyoscine gr. $\frac{1}{250}$ is called for; if, however, she does not recognize the object and says it had not been shown her before, then the depth of desired unconsciousness has been obtained. This memory test is repeated later, and, if necessary, similar doses of hyoscine may be required. The patient usually sleeps between the pains, but generally is conscious during them. She does not, however, fully appreciate the pains as such, and, if asked about them, generally describes them otherwise.

The child is usually born normally, and, after the birth of the placenta, the patient falls into a normal sleep for four to six hours and awakes quite fresh. During the labour she should be catheterized. This is most important, especially in long labours. Patients very often complain of thirst, and in such cases should have water to drink.

Kronig lays stress on what he calls islets of memory. For instance, the patient whilst coming out of the narcosis may hear some noise or see some action which arouses her and may remain in her brain, so that she will remember it, and after the labour will build up her ideas of the labour from this one fact. Thus, the baby should be removed to another room, so as to avoid the mother hearing the child cry and so forming an islet of memory.

The morphine-hyoscine method has been extensively used in America, especially since the beginning of 1914. Hellman has discussed the work done, and has shown that when the Kronig technique was used the results had been excellent.

In the British Isles this method had not been used so extensively. Kronig's technique had not been adhered to, and most observers have not given repeated doses, but usually one or two doses, in order to lessen the pain. In 1908 Buist published a paper on "Scopolamine-morphine in natural labour." He did not repeat the injections of hyoscine in any number, but seemed rather to give the morphine and hyoscine simply so far as to alleviate the distress of the patient. He summarizes his treatment as follows: "Whenever your patient is distressed by the pains and you expect the labour to last more than an hour, give an injection of hyoscine and morphine; and if you expect it to last a considerable time, repeat the injections, if necessary, in three or four hours." From this it may be inferred that Buist did not try for true "twilight sleep," but rather an alleviation of the pain in distressing cases.

In 1907 Croom published a paper on the subject, and quoted 65 cases. In his cases, however, the injections were always given late in the second stage, when the pains were very severe. This is not the true so-called twilight sleep of Kronig. He seldom found it necessary to repeat the dose, and does not mention repeating the injections with hyoscine alone. In 1915 Croom published another paper, in which he advised the injections to be given at the beginning of the second stage. The repetition of the initial dose, and not of pure hyoscine, also differs from Kronig's technique. Perhaps the greatest advantage of Kronig's method is that the patient is relieved of suffering through a tedious first stage.

In 1911 Giuseppi published a paper in the *Practitioner*, and gave his results based on a series of 37 cases. As the initial dose in most of his cases he used morphine gr. $\frac{1}{4}$, hyoscine gr. $\frac{1}{100}$. This initial injection was given when he considered the amount of pain complained of was sufficient. He did not use the size of the os as a guide. To use his own words, he says, "The time for the administration of the first dose was therefore decided not by the state of the os or by the frequency of the pains, but by the amount of suffering." He never repeated the morphine, and in 16 cases the hyoscine was repeated once only. He did not seem to lay much stress on amnesia, but gauged his results rather from the amount of pain. Thus in 16 per cent. no pain was felt; in 27 per cent. very little pain was felt; in 37 per cent. pain was decreased, and in 19 per cent. pain was felt as usual. It is very difficult, of course, to compare the degrees of pain in the cases of various observers.

Giuseppi goes on to state that in seven cases the mothers did not know of the birth of their children. As this is really the true amnesia, the percentage of true "twilight sleep," therefore, was very low. This was most probably because he did not repeat the hyoscine, and so the narcosis obtained was not deep enough for true amnesia.

In our cases the Kronig technique was rigidly adhered to in the first eight cases, the memory test always being applied, and the results were highly satisfactory. After this, however, less stress was laid on the memory test. We found that it was most useful for the first two or three injections, but that when once the patient had lost her memory it was quite satisfactory and safe to continue the injections of hyoscine gr. $\frac{1}{250}$ at regular intervals of one hour. It was also noticed that after several cases had been treated with this method one learnt to judge from the patient's general appearance whether another injection was required or not. The method of giving the hyoscine every hour relieves the physician of much trouble, as nurses can simply be directed to give an injection at such specified times.

There is, however, a chance of the patient becoming restless, which, according to Kronig, is due to faulty dosage, or to over-dosage. The pharmacology of hyoscine —or scopolamine as it is sometimes called—is not very definite, but Cushny quotes that "Hyoscine in large doses sometimes gives rise to delirium and excitement resembling the delirium caused by atropine."

Whether this restlessness in the case of "twilight sleep" is due to over-dosage or not, is difficult to say. In quite a number of cases over twenty injections of hyoscine were given without the slightest ill effect. In one case only was there very marked restlessness. In this case the patient began to be restless after the third injection, which seems to put over-dosage of hyoscine out of the question. In one case forty-five injections were given without the least sign of restlessness. This was the greatest number of injections

given in any one case, and shows that hyoscine is not so dangerous as it is supposed to be. Restlessness, therefore, is probably an idiosyncrasy of the patient to the drug. Before these investigations the greatest number of injections in any one case was twenty-two; and Hellman warned that more than this might be harmful. However, in several cases we have given more injections without any ill effects to mother or child.

As it is impossible in hospital to isolate each case in a separate room, it was found that by darkening the room and placing a screen round the patient, whose ears were plugged with cotton-wool, the desired result was obtained. As soon as the patient's memory was gone, injections were given at the fixed interval, usually at intervals of three-quarters of an hour or an hour, according as the patient appeared to be deeply under or not. The second dose was usually given three quarters of an hour after the initial dose of the morphine and hyoscine. In one case, however, the first injection had such a marked effect that the second was not necessary for four hours; on the other hand, if the time before the second injection is given is too long, the morphine will have worn off and the hyoscine will not take effect.

There were in all 40 cases taken consecutively—36 primiparas and 4 multiparas—and with the above technique of regular injections the results were excellent. The initial injections were given early in the first stage, if possible.

Dosage.

The initial dose was, in 36 cases, morphine gr. $\frac{1}{4}$, hyoscine gr. $\frac{1}{150}$; in 3 cases, morphine gr. $\frac{1}{3}$, hyoscine gr. $\frac{1}{150}$. The results of these three cases were: One case total amnesia, one case slight amnesia, and one case no amnesia. In these two last cases there was marked analgesia. It seems, therefore, that, although this smaller dose of morphine will do quite well in some cases, the larger dose is to be preferred. In the other case the initial dose was hyoscine gr. $\frac{1}{150}$ alone. This was given in order to see if it would ease the pain in any way. The hyoscine was repeated twice in doses of gr. $\frac{1}{450}$, but without any effect at all. Morphine gr. $\frac{1}{4}$ was then given, and the case became one of normal "twilight sleep." The reason for trying this method was that in one case the injection of the initial dose of morphine and hyoscine stopped the pains. This is apt to be so if it is given very early before the pains are quite regular, which rather helps to prove that the morphine has some effect in diminishing the strength of the pains.

In three cases the morphine was repeated. One case was a very long labour, in which, after the first twelve injections of hyoscine, the patient began to recover consciousness, so that morphine gr. $\frac{1}{3}$ was given. This had a beneficial effect, and the patient passed well under narcosis again. The second case was also one of a long labour; the pains at one period stopped altogether, and did not start again for twelve hours, and then were not very good. The child in this case was slightly oligopnoeic. The remaining case was one in which the pains seemed to be stopped by the initial injections, although strong before. The pains returned in ten hours, when the morphine was given again. The baby was slightly oligopnoeic. The labour was completely amnesic.

The smallest number of injections by which amnesia was obtained was four, including the initial dose, and the greatest number forty-five, including two doses of morphine. The average number of hyoscine injections per case was eleven; this is in the total number of cases. In the thirty cases in which the results were perfect, the average number was twelve injections.

Results.

Total amnesia and analgesia were obtained in 30 out of 40 cases—namely, 75 per cent. This means that the patient had no memory whatever of the labour after the first pin-prick, and so, being unable to remember anything, says she had no pain. The patient, however, may have complained during the labour of something, but has not appreciated the something as pain. The other cases varied from slight amnesia 13 per cent. to no amnesia 12 per cent. It was found that in practically every case there was at least slight analgesia. However, three cases were in some degree practically failures. In one treatment was started very late—namely, when the os was fully dilated, and the injections seemed to have no effect. In another the patient was a primipara of 42 with a very long and painful first stage.

It is interesting to compare these results with those of Hellman, whose are the latest published. His results were obtained at the Lebanon Hospital, New York.

	Our Cases.	Hellman.
Amnesia	75.0%	67.95%
Slight amnesia	13.0%	13.59%
No amnesia	12.0%	18.12%

Complications.

Restlessness.—In one case only was there marked restlessness so that the injections had to be stopped, but the mother had no recollection of having been restless. This was the second case on which the method was used, so the defect may have been due to lack of knowledge or faulty dosing. The case is described later. Hellman also notes such a case. One observer advises the repetition of the morphine in cases of restlessness, but this was not tried.

Post-partum Haemorrhage.—There was only one case of this incident, and it was easily checked by hot douching and pituitrin.

Forceps Cases.—There were 14 forceps cases in the 40 cases, or 35 per cent. This, no doubt, seems a large percentage, but is no higher than under ordinary circumstances in our practice, which entails the application of forceps after the second stage has lasted three and a half hours. From this it may be inferred, so far as we could decide, that the scopolamine-morphine did not in any way interfere with the strength of the pains. In five cases forceps were applied without chloroform; in the others they could have been applied without pain, but the patients, on being interfered with, became restless, so chloroform was given, merely to allow of their more simple application.

Comparing the statistics for these complications with those of Hellman:

	Forceps.	Post-partum Haemorrhage.
Royal Maternity Hospital ...	35%	3.3%
Hellman	9.06%	2.5%

Giuseppi in his paper quotes a percentage of 33 forceps cases.

Baby Statistics.

In the 40 cases there were 40 babies, 5 dead born, but in only one of these was the labour normal.

One was a case of contracted pelvis with prolapse of the cord. The child was turned and extracted with difficulty. The patient only had four injections, and then chloroform. She had come into hospital well on in labour, with a previous history of a stiff forceps case. The second dead-born baby was a very badly nourished premature child of a woman who had a very bad heart lesion. The third was a craniotomy for contracted pelvis, where the second stage was allowed to continue for nine hours to permit of moulding. The fourth a premature child of seven months. The fifth was a normal labour, which lasted twelve hours, during which eleven injections were given.

Out of the thirty-five babies born alive, only four required any artificial stimulation. In two of these cases the morphine had been repeated, and the labours were very long. In all cases the child cried on being smacked and having cold water thrown on it. In several cases the method of injecting the morphine and hyoscine late in the second stage, to relieve the pain, was tried. This was done in patients who were too far on in labour for the proper technique to be attempted; in these it was generally found that the babies born were oligopnoeic. This helps to prove that when the initial injection is given in the second stage the chances of the baby being born oligopnoeic are very much increased.

Hyoscine alone has evidently no effect on the child. In the case of forty-five injections the baby cried at once.

From these points it can be seen that the danger to the child is very slight. The four cases of oligopnoea were not at all severe, and required only slight stimulation.

Comparisons.

The following cases are worthy of mention.

CASE I.

Mrs. H., 1-para, aged 34. Admitted 2.15 p.m., February 27th. She had had three eclamptic fits before admission. She was

due in the middle of March. Her blood pressure was 168, and she was treated with veratrone. She had two more fits, but after more veratrone her blood pressure went down to 80, and they ceased. Her urine contained 4 grains of albumin per ounce, and she passed 6 oz. At 10 a.m. next day the patient went into labour, and at 11.30 was given morphine gr. ¼, hyoscine gr. $\frac{1}{150}$; the os admitted one finger, and the pains were strong. Her blood pressure was taken every half-hour and veratrone given when it was high. The injections of hyoscine were given every hour; after the third injection her memory was gone, and she was sleeping. The injections were continued, and the baby was born at 11.30 p.m. with forceps without chloroform (to bring the head over the perineum). The baby cried at once. The veratrone was continued during the labour to keep the blood pressure low. The mother and child both did very well, and left hospital twenty days later.

Case II.

Mrs. M., aged 31, 1-para. Admitted 11.45 p.m., March 14th. Os the size of a shilling; pains strong. At 1 a.m. on March 15th, morphine gr. ¼, hyoscine gr. $\frac{1}{150}$; the hyoscine was repeated in gr. $\frac{1}{200}$ doses every hour. The patient slept; she said she felt pains a little, and at 2.30 p.m. became more awake. Morphine gr. ¼ was given at 2.30 p.m. The hyoscine was continued every three-quarters of an hour. These were continued all the next day, March 16th; the patient was sleeping most of the time, and when asked if she felt any pain, she complained of a sore shoulder and wandered in her talk. At 9 p.m. on March 16th, the head appeared to have stuck, so forceps were applied. The os had been fully dilated for some hours, but the patient had been left to see if the child would be born spontaneously; for the fetal heart sounded good, and the patient's condition likewise. As the patient was slightly restless, chloroform was given. It was a firm pull, and there was a slight tear. The baby was born at 9.45 p.m., March 16th, and cried at once. Next day the patient could remember nothing except the pain she had when she came into hospital. She had quite lost count of the days, and did not know what day it was. The total number of injections in the case was one morphine gr. ¼, hyoscine gr. $\frac{1}{150}$, one morphine gr. ⅓; forty-three injections of hyoscine gr. $\frac{1}{150}$. This was the greatest number given.

During the labour she had drinks of water and was catheterized. She appeared very fit the next day after the labour, and the child was very well.

Case III.

Mrs. A., 1-para, aged 26. Admitted February 18th. On February 18th the pains were very strong and regular, and the os admitted two fingers. Morphine gr. ¼ and hyoscine gr. $\frac{1}{150}$ was injected. In half an hour the patient was sleeping, the hyoscine was injected after an hour. She was very congested about the face, and complained of great thirst. She was sleeping between the pains, but awoke during them. At the end of three hours from the first injection (she had had two of hyoscine and her memory had gone) she began to get a little restless during the pains. The injections were continued, but the restlessness got worse. She became obstreperous, tearing her hair, throwing herself about, and trying to bite the nurses. She had to be held in bed. However, she did exactly as she was told at the time—namely, when told to lie down she did so, but the restlessness soon started again. It was decided to stop the injections. Her memory was still gone, but it was difficult to apply the test. Two hours later she was much quieter and delivery was quite normal. She had eight injections. She slept for six hours, and then she felt quite all right. She could not remember anything about the restlessness, but just remembered the baby being born. The baby cried at once.

Summary of Procedure.

The following is a summary of special points which are most important:

1. In the case of a primipara the first injection must not be given too early, as it tends to stop the pains. The rule of giving the first injection when the os admits two fingers, and the pains are regular, is a useful one. In the case of a multipara, however, the injections cannot be given too early after the pains have started. It is generally found that the first injection is given too late.

2. The second injection, namely, the first $\frac{1}{150}$ gr. of pure hyoscine, should be given about an hour after the initial injection, whether the patient is well under or not. If this injection is delayed the effect of the morphine tends to wear off, when the future injections of hyoscine will not take effect.

3. The injection can with safety be repeated either at hourly or three-quarter hourly intervals.

4. Do not repeat the morphine in the latter part of the second stage or the child will most probably be born oligopnoeic. If the hyoscine is not taking effect, then it is well to give the mother a slight whiff of chloroform; thus the hyoscine is allowed to work and the patient gets again into the condition of "twilight sleep."

5. The patient's friends must be kept away from the room, which ought to be quiet and darkened.

6. Patients, if thirsty, must be given water to drink.

7. The bladder must be catheterized during long labours.

8. Remove the baby to another room after birth, so that the mother cannot hear the cries, otherwise she may remember the cry and so piece together, and so imagine her whole labour.

Conclusions.

From the foregoing experience it may be stated that we have a safe and efficient means of managing labour painlessly in the majority of cases. It requires, however, the constant attendance of a competent attendant. This rôle can be efficiently undertaken by a reliable nurse under supervision, which makes its adoption in better class private practice possible to the medical practitioner.

It is of special value in primiparae, in whom as a rule the first and second stages of labour are long and painful.

It is also of great value in a prolonged second stage, due to a large head or slightly contracted pelvis, as it allows of head moulding without unduly exhausting the patient.

So far as amnesia is concerned, it is of little use to commence the treatment during the second stage.

The strength of the uterine contractions is not diminished, hence its advantage over chloroform. There are no contraindications to its use beyond extreme restlessness, which is very exceptional, and probably due to an idiosyncrasy.

The absence of exhaustion after even a long labour is one of its greatest advantages.

Thirty-seven of the forty patients rose from bed on the third day after labour.

It is regrettable that such a great deal of publicity has been given to the subject, and that prominent specialists have allowed themselves to be exploited through the lay press, as the lay community suffers from the want of knowledge and sense of proportion which allows of an estimate of its value under various conditions, and is therefore too apt to attempt to force the hand of the careful practitioner. At the same time, the method of management of labour is so good from the point of view of relief of suffering, that it may help materially to bring about the increase of the birth-rate so much required, which is perhaps the only argument in favour of publication in lay journals, etc.

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RETRACTION OF THE UTERINE MUSCLE ASSOCIATED WITH OBSTRUCTED LABOUR.

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In 1906 I reported two cases of premature retraction of the uterus occurring in primiparous patients. In both cases the brim of the pelvis was contracted moderately, and in one there was some oblique distortion. In neither case was the bony obstruction of the pelvis too great to prevent delivery with forceps or with the cephalotribe after perforation of the fetal skull. Since then I have seen two more cases.

My reason for again bringing the subject forward is because I know that this condition is not often recognized and that I have altered my own views in the light of further experience.

In order to make the condition clear I will give one case in detail.

A primipara, aged 30, rather short in the long bones and square about the head, went into labour at full term on June 27th, at 10 p.m. She was seen by the doctor next morning; he found the os about the size of half a crown (about 3 cm.). The fetal head was high above the brim and freely movable. The head seemed half extended. The diagonal conjugate was taken and measured 4¼ in. The cervix hung loosely below the presenting part. By 8.40 p.m. on June 28th the os was apparently fully dilated, but still not filled by the presenting part. The doctor came to the conclusion that there was enough room to allow of an easy delivery with forceps. The membranes had