OBSTETRICAL ANALGESIA.

With special reference to the ETHER-OIL-QUININE method of rectal instillation.

A THESIS

for the degree of M.D. submitted by

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O B S T E T R I C A L A N A L G E S I A.

INTRODUCTION.

There is a general consensus of opinion amongst medical men, whose experience of human joy and sorrow is unparalleled, that women should receive every possible relief in their unique function of bearing a child. There are, however, wide divergences of opinion as to how this desideratum can best be achieved.

So many new drugs have been lauded to the skies only, after critical and exhaustive trials, to be cast to earth again, and so many painless methods have been enthusiastically tried out only to be reluctantly abandoned that it has been gradually forced upon the minds of investigators that the ideal anaesthetic has yet to be discovered and that a long and arduous path lies before them ere the ideal is attained.

For reached it must be, since women, despite their inborn capacity for suffering, their stoicism in facing their ordeal and their fortitude in endurance, have at last realised that their insistent demands for relief can no longer be denied.

When it is realised that over 60% of births in this Country are attended by midwives and that little or no relief is afforded to these patients, one is appalled by the amount of needless suffering that poor women are called upon to endure. Anything that can be devised to alleviate some of this well nigh intolerable anguish will merit and earn the approbation of the whole civilised community.

Dame Mc.Ilroy says:-" A painless labour can never be a safe one, but a considerable alleviation of suffering must be within the scope of every practitioner" (i).

By the skilful and judicious use of drugs the sufferings of the parturient woman can be minimised without danger to herself or her child and the miseries endured by the mothers of countless generations greatly ameliorated.

Between promising an absolutely painless labour on the one hand and allowing untold tortures on the other, there must be a happy compromise and the drugs selected for this purpose should be employed to meet the individual requirements of the case and within the limits of safety.

A proper system of "Balanced Anaesthesia" could be evolved whereby no single drug should be expected to take the brunt of the whole procedure. Instead, two or more should be used in succession in such a way that the effect of the second was reaching its maximum as that of the first was passing off, thus ensuring a smooth and harmonious combination.

The effects of a painful, long drawn-out first labour are more marked than is at first realised. They include the horror of subsequent pregnancies, they disturb the perfection of marital relations and may finally lead to a resort to the use of abortifacients with their dire pathological effects. They lead also, to an unstable mentality and a desire to hand on to succeeding generations, with calamitous results, the knowledge so grievously acquired.

The difficulties in the way of ameliorating the agonies of childbirth can be appreciated when it is realised that by far the greatest proportion of this work is still in the hands of the general practitioner and midwife. No scheme can be of any use unless it includes their co-operation and goodwill.

In hospital and in expensive nursing homes there are always means at the disposal of the Specialist, but poorer persons in their own homes have little relief from the wearying pains of the first stage; indeed, respite is often delayed until they have become exhausted by their sufferings and are almost at the end of their resources, when a sympathetic doctor, yielding to their insistent demands, applies a chloroform mask and terminates their sufferings by forceps.

I feel convinced that a considerable amount of the present high rate of maternal mortality is due to the lowered resistance engendered by excessive fatigue, shock and sepsis - direct results of withholding relief during labour.

To allow the administration of such drugs as the Barbiturates by midwives will require a special Act of Parliament, but when the suitable drug is found, as I feel certain it will, the parturient woman will enter upon a new and happier era.

and the bad old days will have vanished like some hideous dream.

The small amount of relief given to women in childbirth is shown in the following extract:-

" In 1931 an appeal was made by Mrs. Baldwin "
" in the Press, for a Fund to enable routine "
" anaesthesia to be provided for the labours "
" of poor women. The London County Council "
" invited its Public Health Committee to "
" consider and report on its desirability, "
" and the following information was obtained:"
"Out of 7,454 patients delivered in 1929, "
" 1 in 8.5 received a sedative, an analgesic "
" or an anaesthetic; 1 in 19.5 a sedative only"
" 1 in 18 an analgesic only; 1 in 89 a general"
" anaesthetic, mostly abnormal cases. "
" At five out of twenty two hospitals light "
" anaesthesia was given to a few normal cases"
" - mostly primiparae. At eleven hospitals "
(ii) " analgesics were employed. At one hospital "
" half the patients received this form of "
" relief, but in most hospitals only a small "
" percentage. Many of the physicians in "
" charge of maternity hospitals were opposed "
" to general anaesthetics as a routine, as "
" they believed it delays labour, increases "
" the risk to mother and child. "
" In some quarters there was a considerable "
" prejudice against anaesthesia amongst the "
" poorer classes, but there was a great demand"
" for it amongst those who were able to pay. "

The Report of the Committee stated that"it felt that the provision of light anaesthesia, having regard to modern opinion and practice, should be conceded."

This condition of affairs in England is in striking contrast to that in America, where it is the rule that a pregnant woman is entitled to all the relief she can obtain, not only in the final stages but throughout the whole of the labour.
Some method of analgesia is practically routine in all the large Lying - in Hospitals, and the public have been so educated that the physician who refuses it is considered seriously behind the times, in his profession.

In the majority of cases some form of pre-medication such as morphia, pernocton, sodium amytal or nembutal is given followed by an installation of rectal ether, according to Gwathmey's technique, with or without modification.

Since 1926 Gwathmey's method has been the keynote of obstetrical analgesia and some modification has been used in thousands of cases without the slightest anxiety about the condition of either mother or child and with the greatest relief to the suffering mother. This statement is completely borne out by a close study of the Journals devoted to obstetrical anaesthesia, in the United States of America and Canada.

The literature dealing with the Gwathmey technique in this Country is very sparse and although the method appears to be well known, the application of it to any great extent is conspicuous by its absence. It is mentioned by Dame Mc. Ilroy without enthusiasm (iii); Connell states that it has been associated with so much well grounded adverse criticism that he has never tried it.(iv) Beattie points out its disadvantages in an article in the "Lancet". (v)
Roques at the Middlesex Hospital, states that it has been conspicuously unsuccessful in the few cases he has tried there (vi); Leslie Williams of Queen Charlotte's Hospital considers that it appears to have great possibilities but that his experience of it is slight (vii).

Malkin, a colleague of mine in Nottingham, was discouraged by some relative failures in his early cases at University College Hospital.
The method is described in "Recent Advances" (viii) but no account of its trial is given in this Country, other than Malkin's experiences just mentioned.

Even in the latest literature, e.g. "British Medical Journal", 24th. February, 1934, Featherstone does not refer to it (ix); nor does Parsons in "A Review of Modern Progress", March, 1934. (x).

On the other hand, O'Donel Browne, in "The Irish Journal of Medical Science", April, 1931 (xi) describes a series of over forty cases and reports that he secured complete relief in 51% and moderate results in 46%, one patient being kept under treatment for 35 hours with four instillations and terminating with a spontaneous delivery and a live baby. The average length of labour in primiparae was seventeen hours and in multiparae six hours.

By way of contrast, American literature abounds in articles dealing with the method.
Harrer states that he had complete amnesia in 85% of his 5,800 cases. (xii).

Gwathmey, in a series of 20,000 cases, claims great relief in 90% (xiii).
Davis, in his experience of over 12,000 cases, states that he finds no contra-indications (xiv).
Dr. Spiller, the Superintendent of the New York Lying-In Hospital continues to employ it as routine in both indoor and outdoor cases and after an experience of over five years claims that the method has more than casual merit and should command the interest of everybody attending parturient women.

Mc. Cormick, of the Indiana University School of Medicine, with whose modification this paper is chiefly concerned, states that after six years experience of using rectal ether, he is amazed and bewildered at the method's lack of popularity, more particularly amongst home obstetrics which include more than 75% of American confinements. (xv).

HISTORY.

Rectal analgesia is no new thing.
Dioscorides, Surgeon-Botanist to Nero's Armies recommended Wine of Mandragora as a Clisterium to dull the pain of an imminent surgical operation.
Erman, in 1808 was the first to observe that air introduced into a fish's gut, caused the blue blood in the portal veins to turn bright red; hydrogen or nitrogen caused the blood to be coloured a dark purple.
Four years after the announcement of anaesthesia by Crawford Long in 1842, Roux induced surgical anaesthesia by the injection of pure or aqueous ether into the rectum. In the following year, 1847 Pirogoff vapourised ether by heat and passed it into the rectum by the pressure thus produced.

In 1903, Cunningham for the first time, used a water bath at a temperature below the boiling point of ether and carried the vapour in by a stream of air, the return of which was intermittently facilitated by the anaesthetist placing his finger in the rectum alongside the delivery tube.
A little later, Sutton using oxygen instead of air as a vehicle and with a constant return of gas through another tube maintained continuous anaesthesia by this route in 140 cases at the Roosevelt Hospital.
Little more was done until 1913, when Gwathmey completed his experiments with animals and described the method of colonic ether administration now so widely associated with his name.

ANALGESIC METHODS.

Numerous other methods for obstetrical relief have been recommended by various Authorities, but only a brief reference to them is possible.
Morphia and Scopolamine in the first stage are still in vogue in this and other Countries, but the constant supervision necessary, the attendant restlessness, thirst, frequent need for catheterisation and hallucinations have brought it into disfavour.

My own experience of this method, many years ago, in 200 cases, proved that at least in hospital, it was the most satisfactory form of analgesia, but in labours quicker than was anticipated, I received so many scares due to sleepy babies that I was compelled to abandon it. An early dose in a nervous primiparous patient is however, a great help and in private practice I have no hesitation in giving it.

Scopolamine alone, also has its advocates; Van Hoosen showing excellent results in 2000 cases(xvi).

Avertin has also been strongly recommended; Connell having good results in Birmingham; Martin and Sonnewald, Reed, Wall, and Pierce in America; Benthin of Konigsburg and Martin of Elberfeld are all its strong supporters. James Young of Edinburgh states that its use in general surgery has revolutionised his wards. It appears to be contra-indicated in disease of the liver, colon, kidneys and in thyroid insufficiency. (xvii).

Sacral block and spinal anaesthesia have also their advocates but neither is applicable to the first stage.

More recently the barbiturate group has come into prominence and although there is a great divergence of opinion as to their relative merits or demerits, it appears that from this group will come the solution of our difficulties for the proper treatment of the first stage. They may be used orally, which is an enormous factor in their widespread applicability, intravenously or per rectum.

Hamblen and Hamblin used sodium amytal orally as the sole analgesic and obtained amnesia and moderate analgesia in the great majority of cases; restlessness and lack of co-operation on the part of the patient being the principal drawbacks (xviii).
Massey used sodium amytal intravenously and his conclusions entirely coincided with Hamblen's (xix).
Featherstone has also used it intravenously in doses up to 15 grains but this is considered to be too big to be generally accepted.

Cohen and Bristol working independently recommend an oral dose of sodium amytal combined with 1/200 grain of scopolamine early in labour and state that there are no ill-effects on the baby or mother and good amnesia results.

Axelrod of Ohio has had uniformly good results with a combination of nembutal and rectal ether mixture; the maximum dose never exceeded one gramme and complete analgesia was obtained for from twelve to eighteen hours with no ill-effect on the baby and no interference with uterine contractions, pulse, respiration and blood pressure were not materially affected. (xx)

Pernocton and more recently, sodium evipan have been tried chiefly in the second stage, with encouraging results.

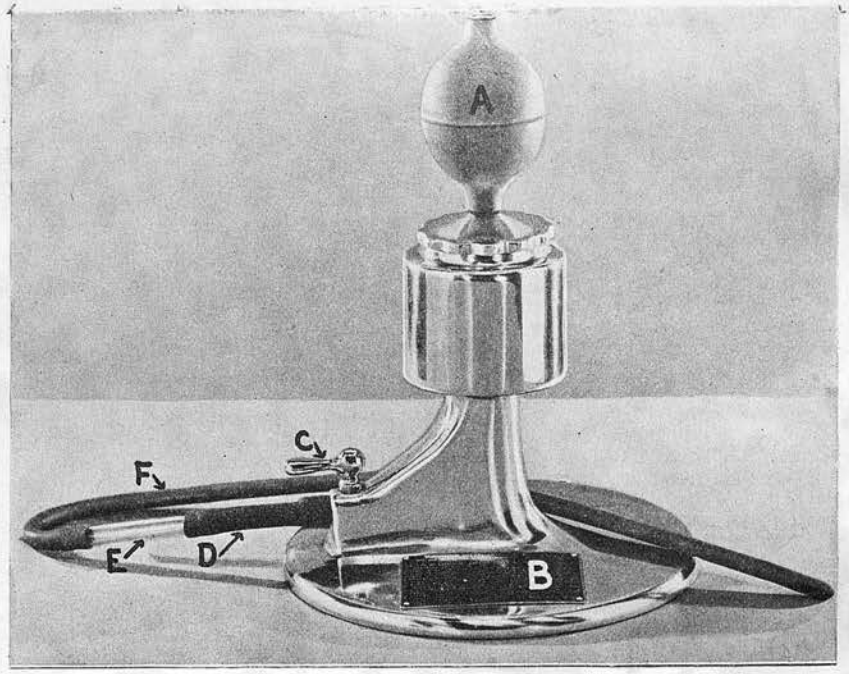
None of these methods however, fulfils the requirements of "Balanced anaesthesia" as already defined; they do not carry the patient over a long and difficult labour. The ideal method as practised in this Country consists of some form of premedication, such as morphia and scopolomine to cover the first stage followed by gas and oxygen for the second stage. The chief objections are relatively high cost and the necessity for the presence of an experienced anaesthetist for many hours together with a cumbersome apparatus.

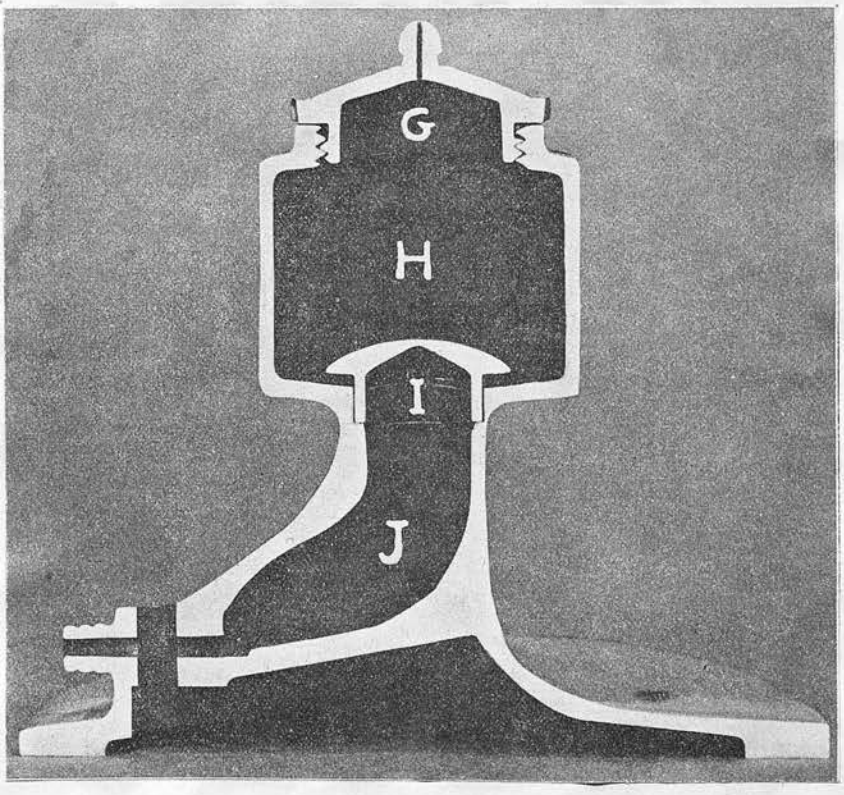
After having reviewed the various methods I decided that the one that appealed to me most was the modification of Gwathmey's method as suggested by Mc. Cormick and carried out by him for the past four or five years. To do so necessitated the purchase of his special apparatus for rectal administration and this was obtained from Messrs. Condensed Gas Co. Limited, of Manchester at a cost of £5.

It consists of an aluminium stand with a circular base, 6½" high and weighing 1½ lbs. with a container for the mixture and provided with a stopcock, DeVilbiss bulb and catheter.

The following illustrations show the complete apparatus and the same in section:-

Mc.Cormick's "E.O.Q" Apparatus.





A. DeVilbiss bulb.
B. Metal plate bearing instructions
C. Stopcock
D. Rubber connecting tube.
E. Glass connecting tube.
F. Catheter.
G. $1\frac{3}{4}$" screw cap.
H. 5 oz. Chamber.
I. Fixed stratifier.
J. 1 Oz. Chamber.

This apparatus possesses the following advantages:-

1. With it the need for assistance is eliminated.

2. There is little or no messiness.
3. The actual installation is completed within 30 or 40 seconds, i.e. within a pain interval.
4. Retention is higher, better, easier and more comfortable.

To appreciate the advantages of the Mc. Cormick technique a brief description of the Gwathmey method is necessary and by the courtesy of Mr. Malkin who had the opportunity of seeing several cases in New York I have been enabled to obtain a copy of the printed rules issued to interns in the New York Lying-in Hospital, which reads as follows:-

" When cervix is two fingers(1 inch) dilated, with pains three to five minutes apart, and lasting 30 or more seconds give (1) intramuscular injection of 2 c.c. sterile 50% solution of magnesium sulphate and $\frac{1}{4}$gr. of morphin sulphate. If sedation, wait until effect begins to wear off, or, if no relief within (20) minutes, repeat (2) intramuscular injection without morphin, and give by rectum the following instillation;

Quinin alkaloid ,,,,,,,,,,	grains 20
Alcohol	minims 45
Ether	ounces $2\frac{1}{2}$
Petro liq heavy	ad ounces 4.

Twenty minutes after rectal instillation, give (3) intramuscular injection of 2. c.c. sterile 50% solution magnesium sulphate (no morphin).

THE STANDARD TREATMENT is three (3) injections and one (1) instillation.
If labour is prolonged beyond four hours from the first injection the entire technic can be repeated with safety, except that the morphin is omitted when delivery is expected within one hour.
If an anaesthetic is required when head is passing over the perineum, use ether sparingly. To superimpose an anaesthetic upon a partially analgesic patient is dangerous for the child.

Details of Technic.

1. When labour begins, give soap suds enema then tap water until bowel is clean. Patient should walk to toilet when possible. Repeat tap water enemas every eight hours. If practical, a rest of at least four hours should intervene before treatment. Catheterise if necessary.

2. Cleanse the site of injection with iodin and alcohol, be sure the needle and syringe are absolutely sterile. Sterilise the outside of the ampules with alcohol. If the ampule with morphin is not at hand, dissolve the morphin tablet separately in a small amount of water and sterilise before it is drawn into the syringe containing the magnesium sulphate. State to patient that object of injection is to relieve pain.

   Give the intramuscular injection during a a contraction. Insert a long needle deep into the gluteal, deltoid or subscapular region and inject solution as needle is gradually withdrawn. Avoid injecting solution into skin and subcutaneous tissues.

   Keep patient as quiet as possible. Place cotton in ears and cover eyes with dark colored material or towel. If in a ward the bed should be screened; if in a room lower the shade and close door. Give only necessary attention talking in a quiet voice and making all manipulations as gently as possible. Note time of intramuscular injection and fill out analgesic chart as labor progresses.

3. Just before giving rectal instillation state that object is to relieve pain. Place patient on left side, Sim's position. Apply vaseline liberally around anus so that the ether if expelled will not burn. Fill catheter and rubber tubing to funnel with warm oil to exclude air. Insert gloved finger into rectum and direct catheter about eight inches i.e. beyond fetal head. Lower funnel below level of anus and allow oil to return to funnel together with any gas that may be left. Now elevate funnel. As last of oil is leaving funnel add warmed mixture. Finally add a sufficient amount of oil at 100° to make a 5 or 6 ounce mixture. Give the whole amount between 3 to 5 contractions. Clamp the catheter below glass connection so that no air can follow and then withdraw catheter. Make pressure on perineum with a towel for 10 to 15 minutes during contractions. Instruct the patient to breathe deeply with mouth open during contractions and to "squeeze up" in order to induce reversed peristalsis. From now on, the patient may be allowed to lie in the position most comfortable to her. Do not make a rectal or vaginal examination within one hour after instillation."

"Make full notes on back of chart.
Mark charts,

A. No inhalation, baby crying.
B. Inhalation, baby crying.
C. Inhalation, baby apnoeic, or asphyxia, slight relief to mother.
D. Failure. "

Gwathmey claims that:

1. 90% of the patients secure some relief, many a great deal.

2. Patients are quieter, undergo less strain, and are in better condition the day after labour is complete.

3. The ether relaxes the perineum so that if anything, the perineal stage is more rapid.

4. Operative delivery, asphyxia of the child during labour, still births and post partum haemorrhage even if the delivery occurs within one hour after morphia-magnesium sulphate are not more frequent than if the method had not been used.

5. Posterior positions are not prolonged, rotation of the occiput occurs just as frequently as in ordinary cases.

6. There is no subsequent irritation of the rectum or perineum.

7. The use of forceps is, if anything, decreased.

8. Morbidity of the mother is decreased, and no foetal deaths are attributable to the analgesia.

These claims are fully endorsed by Mc. Cormick and it was due to his desire to increase its popularity by simplifying the ease of administration that his suggestions were put forward.

He describes three major modifications, the first being the "E.O.Q." apparatus already described. The second consists of substituting oral nembutal for the intramuscular injections of magnesium sulphate, believing that these injections constitute the largest single factor in preventing the more general adoption of the Gwathmey technique. He states that intramuscular injections are primarily surgical procedures, much more so in the hands of a

student or nurse, and may lead to sloughing especially if injected into the fascia lata.
The synergistic action of magnesium sulphate has also been disclaimed by many authorities and is, in his opinion, quite unnecessary.

The third major modification is to substitute the degree of the patient's discomfort for the degree of cervical dilatation in determining the time when the sedatives and rectal ether are to be given.

This to me constitutes the most difficult part of the procedure. It is not easy to estimate from abdominal examination or the patient's behaviour the degree of dilatation necessary for the correct timing of appropriate administrations.
Women vary enormously in their reaction to pain depending on their temperament, education and mentality. Some will complain bitterly long before there is genuine pain and no corresponding cervical dilatation; others of more phlegmatic temperament will suffer in silence until the end of the second stage is almost complete.

Some of my earlier cases were not as successful as they might have been because in the absence of any vaginal examination instillation was given either too early or two late. It would appear preferable to make one or even more vaginal examinations under strictly aseptic conditions than to negative the chances of success by ill-timed administrations.

Minor but no less important modifications are:-

1. Substituting a sodium bicarbonate enema for the soap suds enema. Soap may be just as irritating to the mucous membrane of the rectum as it is to that of the eye. Rectal irritation has not occurred in any of my cases; some patients have complained of a burning sensation during the act of installation but never referred to it subsequently.

2. Employing a tragacanth lubricating jelly for protecting the rectum and anus. This does not deteriorate rubber goods and being non greasy and water soluble greatly facilitates the cleansing of the patient and the linen.

3. Omitting the warming of the solution as being unnecessary. The absorbability of the ether at room temperature is sufficiently rapid through the rectal wall.

4. Foregoing the second or follow-on ounce of olive oil as superfluous and adding to bulk and cost. The "E.O.Q." apparatus only accommodates the initial ounce of pure olive oil and the four ounce mixture.

5. Dispensing with or not insisting upon the darkening of the room and the stopping up of the patient's ears.

He also, at the beginning of labour explains to the patient that the object is to make the process as painless as possible and briefly tells her what is going to be done; he believes that this secures more satisfactory co-operation.

Beyond saying that something will be done to ease the pains I have carefully refrained from promising anything to the patients as I believe that they are often led to expect too much and if an absolutely painless labour does not result, are apt to be disappointed.

Mc. Cormick in his earlier cases, because of its special safety and lack of ill effect on the uterine contractions, used sodium amytal but on account of the objectionable feature of restlessness, replaced it by nembutal.

This drug is claimed to have the following advantages over amytal:-

(a) It is perceptably more potent and although said to be pharmacologically twice as toxic only requires half the dose.

(b) It appears to act more quickly; delirium if and when it occurs, is of much less degree.

(c) The amnesia is deeper and the hypnosis less protracted.

A storm of controversy exists at the present time in this Country over the use of the barbiturate group, more particularly in General Medicine and the widely divergent views of two such eminent authorities as Sir William Wilcox and Sir Maurice Craig do not help to clarify the issue.

Yet, it has been shown elsewhere that in the

doses suggested, as applied to obstetrics there is little or no risk to the mother or child. Obstetrical anaesthesia is not comparable with the surgical form, light anaesthesia being of little use in the latter whilst of the greatest benefit in midwifery practice.

The question of habit formation does not arise as the necessity for administration is short lived.

In the doses suggested there is no doubt that pain can be relieved without any serious interference with uterine activity, and there is little or no risk in leaving the administration of drugs of this type to a capable nurse for use in the first stage.

O'Sullivan and Craner using nembutal with chloral hydrate have had 62% of successes and only 7% of failures; they consider that it may be safely applied by midwives. (xxi).

Freda Kelly at University College Hospital with slightly different doses had very good results in 100 consecutive cases. She reports 62% as completely successful with failure in 13% and also considers that better results could be obtained in domiciliary practice where quiet and freedom from noise would be ensured (xxii).

Professor Miles Phillips at the Jessop Hospital, Sheffield with whom I had the privilege of working in a Post Graduate Course, uses oral nembutal with or without chloral hydrate and speaks glowingly in its favour. It is given by the Maternity Sister from printed instructions hanging in the Maternity Ward.

In view of this difference of opinion a brief reference to the Chemistry of the barbiturate group and its effects on the contractions of the parturient uterus would be instructive and the views expressed in the following section are representative of recent American opinion.

CHEMISTRY.

The development of synthetic drugs has been dependent on the recognition of the relationship between physiological activity and chemical structure. Once a given molecule is known to exert a certain physiological action, by exchanging a group here or removing a group there, the Chemist can obtain from a compound the optimum desired physiological quality.

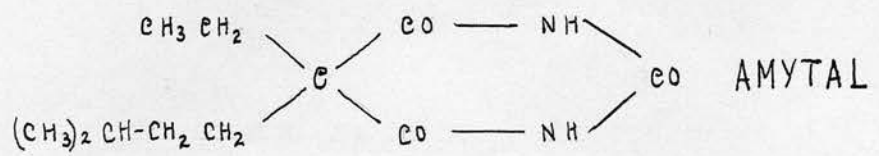
A thread of similarity runs through this apparently diverse group. In each case it is found that a hydrocarbon group (such as the ethyl or amyl groups) is attached to a polar group or acid molecule. The Hydrocarbon groups give to a compound a tendency to lipoid solubility, whilst the polar groups confer water solubility.

A hypnotic may thus be considered to be composed of two parts, a fat soluble hydrocarbon group in which the hypnotic action may be presumed to reside, joined to a water soluble group which affords the necessary degree of solubility in the body fluids.

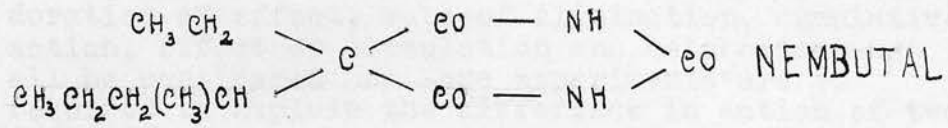
The more effective hypnotics possess a moderate resistance to destruction by oxidation or hydrolysis in vivo, so that sufficient time for them to exert their effect elapses before they are destroyed by the body. Since a satisfactory hypnotic should not produce a cumulative effect, the portion not broken down should therefore be readily eliminated.

It is further found that barbituric acids possessing dissimilar hydrocarbon groups reveal decided clinical advantages; thus, if one of the ethyl groups of barbital is replaced by a butyl or amyl group, an increased hypnotic effect, a more rapid action and a quicker elimination are observed. As a result, a number of barbituric acids possessing different hydrocarbon groups are now available.

The structural relationships of the better known compounds is shownbelow; thus if one of the ethyl groups of barbital is replaced by Iso-amyl, Amytal is produced:-

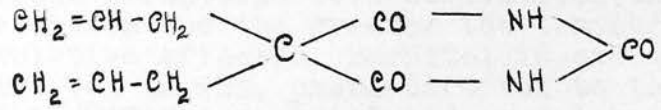


If one ethyl group is replaced by a <u>secondary</u> amyl group, Nembutal is formed:-



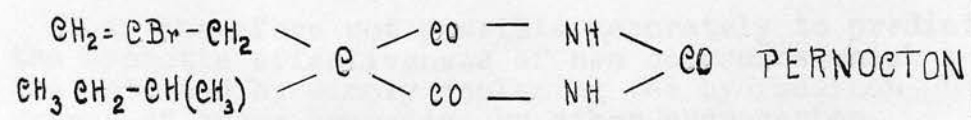
NEMBUTAL

If both ethyl groups are replaced by the <u>allyl</u> group, Dial is formed:-



DIAL

and if one ethyl group is replaced by the secondary butyl group and the other by the bromo-allyl group, Pernocton is produced.



PERNOCTON

It will be noticed that Amytal and Nembutal are isomeric, in the former , the group replacing the ethyl group being iso-amyl, and in the latter, a secondary amyl group. The number of carbon and hydrogen atoms are equal in each case. In the selection of the better therapeutic drug, such qualitative differences as rapidity of action, duration of effect, rate of elimination, cumulative action, effect on circulation and metabolism must all be considered and more experiments are required to explain the difference in action of two isomeric compounds as Sodium Amytal and Nembutal. Both these drugs have the same therapeutic ratio although one is twice as toxic as the other, twice as effective and the resulting hypnosis is half as long. The suggestion that the strength of a specimen may vary according to the proportions of dextro- rotatory and laevo-rotatory components present, has been made and is worthy of further consideration.

The slower the excretion or destruction of the various barbituric acid derivatives, the more lasting the action and the greater the tendency towards cumulative effects. Barbitol is excreted in the urine 74% to 92%, pheno-barbitol to the extent of 11% to 24% but nembutal and amytal have not been recovered from the urine even after long continued administrations (Shonle, xxiii). Other authorities, e.g. Featherstone, say that the drugs are removed from the body by oxidation and detoxication (principally in the liver) and elimination through the kidneys. It is probable that those barbituric acids which cause the briefer duration of anaesthesia and which are not excreted in the urine are rapidly destroyed through the breaking up of the barbituric acid ring with subsequent degradation to ammonia, carbon di-oxide and water.

It is therefore not possible accurately to predict the hypnotic effectiveness of new compounds which are obtained by simply replacing the hydrocarbon groups of known hypnotics by other hydrocarbon groups and the final evaluation of the therapeutic potency of each drug by careful clinical observation. Recent correspondence (xxiv) would seem to indicate that combined with too large a dose of morphia there is a considerable element of risk; in obstetrics however, where prolonged inhalation anaesthesia is not anticipated, this risk is reduced to a minimum; it would be just as unreasonable to withold it in all cases as to withold chloroform because deaths occasionally occur from its use. In America, where its administration is conducted on a much more extensive scale the general consensus of opinion is that its use in obstetrics is completely justifiable .

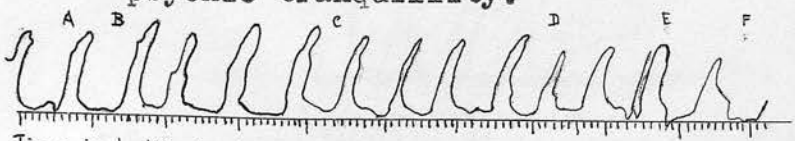
EFFECTS ON THE UTERUS.

In this Country one of the greatest objections to the use of the barbiturate group in obstetrics is that it has been alleged to slow up the uterine contractions. Another objection is its relative toxicity when combined with morphia. A third is an idiosyncrasy towards the drug which can only be discovered by preliminary testing out.

As regards the first objection, Dodek of Washington University (xxv.) with an external hysterograph so arranged as to be relatively insensitive to normal breathing has thrown a flood of light on the reactions of the parturient uterus to morphia, sodium amytal and rectal ether administrations. His principal findings are set out below:-

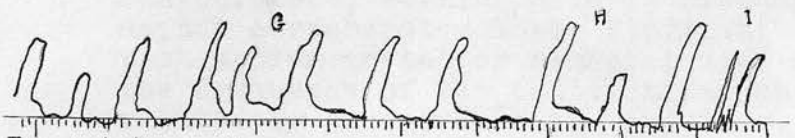
(a) Morphia.

After an injection of this drug, in the first few minutes the intensity of the contractions appears to be lessened to a slight degree, for the next few minutes the contractions again reach their former intensity but the intervals between them are very slightly prolonged and the periods of relaxation for each individual contraction increased.
This might be expected to diminish the duration of the first stage by giving relief from the pains and longer rests between.
There is also a combination of relaxation of the cervix with increased tonicity of the uterine muscle. A further effect of the morphia administration is a general refreshment of the whole organism resulting from increased psychic tranquillity.



Time in half minutes

Fig. The immediate effect of ¼ grain morphine on the uterine contractions in early labour. Depression of frequency and intensity; increased tonicity, cervix dilatated one half finger, vertex presenting.
A, Contractions, very painful, patient very restless;
B, Contractions of long duration; C, morphine sulphate, ¼ grain, hypodermically;
D, patient beginning to feel sleepy; E, patient sleeping between and during contractions, groans a bit during pains; F, duration of contractions increased, intensity somewhat less.



Time in half minutes

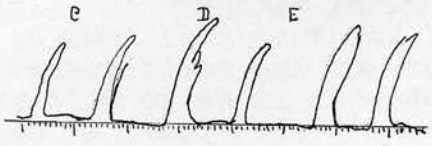
Fig. From 30 minutes to 80 minutes after morphine. Note the increased intervals and prolonged decrements
G, Patient resting completely during and between pains;
H, patient somewhat restless, but not awake, during contractions;
I, fetal movements.

These findings are in complete agreement with those of Bourne & Burn in this Country. (xxvi).

Of the many drugs at our disposal there is no doubt that morphia is the most useful, in fact, some authorities (De Lee &c.) believe it to be indispensable and given with due precautions it alone will smooth out many a difficult case. Combined with one of the barbiturate group its effect is prolonged and its potency greatly increased. Only when it is pushed into the second or third stage of narcosis does it become dangerous.

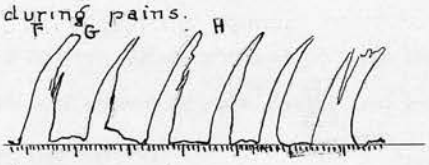
(b) Sodium Amytal.

The effect of oral sodium amytal is seen in the next tracing. It shows no depressant effect - rather the reverse - the contractions may become more intense with coincident relaxation of the lower uterine segment.



Time in half minutes

Contractions of the uterous after the oral administration of sodium amytal, 12 grains.
C, 12 grains sodium amytal were given by mouth;
D, contractions harder;
E, patient sleeping soundly between contractions, is only very slightly restless during pains.



Time in half minutes

Fig F, One hour and forty-five minutes after sodium amytal was administered. Contractions regular and forceful, patient comfortable
G, Contractions more frequent and stronger;
H, Patient sleeps very soundly between pains. Moves about with pains.

Featherstone, working with intravenous sodium amytal corroborates these findings. He states that sodium amytal or nembutal does not affect the frequency of the contraction but appears relatively to increase the expulsive force without embarassment to the child.
The placenta is born speedily and post-partum haemorrhage is reduced.

When the head is on the perineum progress is not delayed as in ordinary labour, in fact, the child may be shot out precipitately with a severe tear as a result.
The effect of sodium amytal on the nervous system is limited to the brain and cord both sensory and motor peripheral organs remaining intact. Its chief action is the depression of the psychic cells with resultant amnesia.

(c) Ether-oil-quinine.

The third tracing represents what happens to the contractions of the uterus after colonic instillation of ether oil quinine. Fifteen minutes after the installation the patient is comfortable and does not complain of pain, but there is a light and really negligible diminution of the intensity and frequency of the contractions which lasts for about twenty minutes before they return to their original intensity.
Even when this happens, the patient remains comfortable. It compares favourably with avertin in that it interferes less with uterine contractions and the degree of relief and relaxation which it affords lasts more than twice as long.

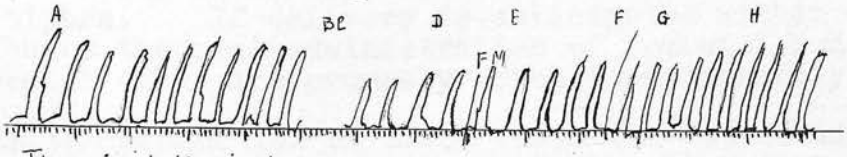


Fig. The effect of colonic ether with quinine upon the contractions of the uterus.
A, Patient restless and uncomfortable during and between pains;
B, colonic ether instillation;
C, 15 minutes after instillation;
D, patient comfortable and does not complain; F.M., fœtal movements;
E, intervals between pains greater and intensity decreased;
F, cough;
G, contractions becoming more frequent and intense, but patient sleeping
H, contractions similar to those before instillation, patient comfortable.

It would thus seem that morphia and one of the barbiturate group such as amytal or nembutal theoretically form an ideal combination for use in obstetrics, the former by its pain relieving

properties producing analgesia and the latter by its action on the psychic centres of the brain producing amnesia.
Given at the right moment in the early stages of labour, they serve to carry the patient on in a smooth and dreamy manner to the more stormy period of the second stage when the second link in the chain of "Balanced Anaesthesia" is continued by the rectal-ether-oil.

This in effect, constitutes Mr. Cormick's modification of the Gwathmey technique and is the foundation of the present series of cases.
His mode of administration consists of giving nembutal, Grs. 3. when the pains become insistent. In two hours or less, according to whether the pains are relieved or not, a second dose of nembutal grs. $1\frac{1}{2}$. is given in this case combined with a hypodermic injection of a quarter or a sixth of a grain of morphia. If the labour is of the prolonged type the second dose of nembutal is repeated once or oftener before the morphia is given. When the effects of the morphia begin to wear off the rectal instillation is given and repeated if necessary but the quinine is usually omitted after the second instillation.

Usually one instillation is sufficient. Morphia is omitted if delivery is anticipated within four hours and is rarely necessary if the patient is a multipara. If delivery is anticipated within four hours the oral administration of nembutal and the rectal ether are promptly given simultaneously.

In the conduction of these cases the Mc. Cormick technique has not been followed absolutely but the main principle of giving a preliminary barbiturate e.g. nembutal or amytal instead of the intramuscular injections of magnesium sulphate and combining it with morphia has been strictly adhered to.

I hoped that a suitable method could be devised by which it would be possible to help the poorest mother in her small and cramped surroundings but as many of these could not afford the privilege of a trained midwife the idea had to be abandoned; adequate and skilled supervision being essential in the simplest case.

Most of these cases therefore, were carried out at the Notts. County Infirmary of which I am the sole Medical Officer.

This hospital, which is administered by the Public Assistance Committee has a Maternity Ward of ten beds and takes in most of the abnormal midwifery of the southern half of the County. It has a modern operating theatre and each Sister holds the C.M.B. Certificate but there is no Resident.

The number of cases is not as large as I would have liked but the time occupied in attending each patient over periods of many hours in addition to conducting a large general practice, has been very great.

The results have been so encouraging that I propose to continue and hope to publish a further series in the next twelve months.
Private cases have had the advantage of a trained nurse to whom the details have been explained beforehand and the E.O.Q. has been administered by myself.

In hospital it was found that after a little experience the Sister could judge with considerable accuracy when to give the doses of nembutal and when the instillation of rectal ether was required.

Telephonic communication was maintained in all cases.

SUMMARY of CASES.

No of Case	Name	Age	Term.	Parity.	Duration of Labour. in hours	Type of Labour.	Pelvic Measurements.	Doses of E.O.Q.	Doses of Nembutal in grains.	Doses of Sodium Amytal in grains	Forceps Delivery.	Inhalation Ether	Complications.	Mentality.	Foetal Embarrassment.	Foetal Deaths.	Slowing of Uterine Contractions	Perineal Laceration	Class of Case.	Remarks.
1	Mrs Wilson	24	F.T.	2-Grav	7	R.O.A.	Normal	1	3	-	No	No	None	Below average.	None.		A little.		B.	Pains apparently slowed after rectal ether. (poor mentality).
2	Mrs Harlow.	25	F.T.	P.	4	L.O.A.	do.	1	1½	-	No	No	None.	Good.	do.				C	Tovaxia, technique slightly modified. Vomited.
3	Mrs Campion	23	F.T.	2-Grav.	4	R.O.A.	do	1	0	9	No	No	None	do	do				B.	
4	Mrs Yarwood.	26	F.T.	P.	4	Breech L.S.A.	do	1	1½	-	No	No	None.	do	do				B.	Pulmonary Tuberculosis.
5	Mrs Lycett.	36	F.T.	8-Grav.	4	L.O.A.	do	1	4½	-	No	No	None.	do	do				C	
6	Mrs Beegon	23	F.T.	2-Grav.	3	R.O.A.	do	1	-	6	No	No	None.	do	do				A	Slight ante-partum haemorrhage.
7	Mrs Jamson	17	F.T.	2-Grav.	3	R.O.A.	do	1	-	6	No	No	None	do	yes.				C	T.B. Larynx. and early T.B. lungs.
8	Miss Jones.	16	F.T.	P	6	R.O.A.	Justo-minor Pelvis.	1	3	-	No	No	Restless and difficult.	do	None.				C	
9	Mrs Berry.	38	F.T.	9-Grav.	3½	R.O.P.	Normal.	1	3	-	No	No	None.	Poor.	do				B.	Baby died 3 days afterwards. Spontaneous rotation of Occiput.
10	Mrs Battison.	27	F.T.	5-Grav.	2½	R.O.A.	do	1	0	6	No	No	Very noisy.	Good.	do				A	
11	Miss May	15	F.T.	P.	9	L.O.A.	do	1	3	-	No	No	None.	Fair.	do				B	
12	Miss Potts.	19	F.T.	P.	20½	R.O.T.	Justo-minor Pelvis.	2	6	-	No	No	None.	Very good.	do		Yes.		A	Spontaneous rotation of Occiput. Pituitrin ½ c.c.
13	Mrs Cooper.	36	F.T.	2-Grav.	14½	R.O.P.	Diag. Conj. 4".	1	4½	-	No	Yes for manual rotation.	Restless.	Good.	do				A.	Light ether for manual rotation of occiput. Pituitrin ½ c.c.
14	Mrs Anthony.	25	36 weeks.	P	4	L.O.A.	Diag. Conj. 3¾"	1	3	-	No	No	Restless.	do.	do				B	Query Caes. Section. Premature baby. Wt. 3 lbs. 10 ozs.
15	Mrs Ellis.	42	F.T.	9-Gray.	6½	Hydrocephalus and Spina. Bifida.	Normal.	1	3	-	Perforation and Extraction	Yes.	None.	Fair.	-	Yes. (Perforation)	Yes.		B	
16	Mrs Johnson	26	41 weeks	P.	6	Anencephalic Foetus.	Normal	1	4½	-	Yes	Yes	Narcosis too deep.	Good.	-	Yes.	Yes.		B	
17	Miss Darby.	25	F.T.	P	7½	L.O.A.	Normal.	1	4½	-	No	No	None	Poor.	None.				A	
18	Miss Stewart.	28	F.T.	P	10	R.O.A.	do	1	4½	-	No	No	None	Very good.	do.				A	
19	Miss Harris.	33	34 weeks	P.	1½	Breech L.S.A.	do	1	3	-	No	No	Hysterical.	do.	do	Yes (Premature.)			C	
20	Mrs Cooke.	21	F.T.	P		L.O.A.	Diag. Conj. 3¾"	1	3	-	Yes	Yes	None.	Good.	do		A little.		B	Query Caes. Section.
21	Mrs Chambers.	19	F.T.	P	1¼	Footling and Prolapse of Cord.	Normal.	1	0	-	No	No	None	do.	Rather blue.				A	
22	Mrs Robinson.	30	F.T.	3-Grav.	11	R.O.A.	do	-	0	12	No	No	None	do	None				B	Precipitate Labour.
23	Mrs Phyllis.	23	38 weeks	P.	12	Contracted. Pelvis L.O.A.	Diag Conj. . 4"	2	3	-	Yes	Yes	Noisy.	do	Yes.		Yes.		B	Query Caes. Section.
24	Mrs Winfield.	26	F.T.?	P.	16	Breech Macerated Foetus.	Normal.	0	7½	-	No	No	None	Very good	-	Macerated foetus.			B	
25.	Mrs McDonough.	23.	F.T.	P.	11	R.O.P.	Generally Contracted	0	7½	-	Yes	Yes	None.	do.	Yes.				D.	

DETAILS OF SELECTED CASES.

Particulars of the whole series of cases will be found in the accompanying Table; supplementary details of the more important ones are set out below:-

Case 1.

Mrs. Wilson, aet. 24; 2-gravida; full term, pelvic measurements normal, vertex, R.O.A., Complained of pains 6. p.m., os admitted 2 fingers, head not engaged.
Nembutal grs. 3 with ¼gr. morphia given.
Pains good and regular; patient called out with contractions, drowsy in between.
9. 15 p.m. os almost fully dilated, Ether-oil-quinine (E.O.Q.) given rectally.
Pains still regular but not quite so strong, patient sleeping in between, membranes ruptured naturally at 12 o'clock, patient delivered of a living male child weighing 7 lbs. 4 oz. at 1. a.m.
Placenta and membranes expelled intact at 1. 25.
Perineum rather oedematous with slight laceration.
Duration of labour, 7 hours.

When questioned next day she stated that she remembered nothing after the injection into the bowel but remembered having pains before. When pressed as to the kind of pain she said that "they were numbed and not half so bad as those she had with the first baby"
As her mentality was not too bright it was difficult to assess the amount of amnesia, but there appeared to be no doubt about the relief afforded by the E.O.Q.

Class B.

Case 2.

Mrs. Harlow, aet. 25, primip., full term, normal pelvis, vertex, L.O.A.
Admitted with slight oedema of legs, puffiness of face and headaches, no vomiting, B.P. 145/95, Urine clear, labour had commenced five hours previously.
Head well engaged, cervix thin, os size of five shillings, having small "niggly" pains, morphia gr.1/6 with nembutal gr. 1½ given at 3 p.m. Membranes ruptured at 5. p.m.
Cervix fully dilated at 6. p.m. when E.O.Q. given. Patient was quiet up to 6. 30 p.m. when she vomited a small quantity of greenish fluid. spontaneous live baby at 7. p.m.

Duration 4 hours in hospital, 9 hours in all.

In view of the toxaemia I decided to continue the treatment on a modified scale and with the exception of the vomiting there was nothing abnormal to report.
Amnesia was only moderate, she said she could remember a good deal of pain but said it was somewhat numbed.
As this was one on my early cases I was ultra-cautious in selection of dose, probably larger doses would have given better results as regards analgesia and amnesia.

Class C.

Case 3.

Mrs. Campion, aet. 23, 2-grav., full term, normal pelvis, vertex, R.O.A.
Labour commenced at 6. p.m. with slight pains occurring every ten minutes.
7. a.m. sodium amytal gr. 6 given by mouth, no effect on pains and patient rather restless.
9. a.m. pains stronger, second dose of sodium amytal gr. 3, followed 15 minutes later by E.O.Q.
Membranes ruptured soon after, pains seemed to slacken a little and patient became much quieter.
Patient complained bitterly when head was being born at 10. a.m. but was asleep soon afterwards.
Placenta was expelled naturally at 10. 15, no laceration. Duration 4 hours.

In spite of her noisiness and restlessness, she remembered very little of the labour after the E.O.Q. and was very hazy about what happened before.

Class B.

Case 4.

Mrs. Yarwood, aet 26, primip. full term, normal pelvis, breech, L.S.A.
Admitted as Tuberculosis, following influenza previously.
Examination revealed dull note in left apex, numerous coarse crepitations over both lungs, with increased V.S. & V.R. Bronchial breathing over left lung behind.
Patient's general condition was very poor,

Urine contained a cloud of albumen and B.P. 110/80.
Labour commenced at 2. p.m., and was evidently distressing. Morphia gr. ¼ with nembutal gr. 1½ given at once to relieve pain.
3. p.m.patient appeared much easier and did not complain so much. Presenting part advancing well and at 5. p.m. E.O.Q. given.
Pains appeared to slacken at first but increased in severity 15 minutes later and continued strong until breech was born spontaneously at 5. 45 p.m. Baby was very small (5lb. 8 oz.) and there was no difficulty with the after-coming head.
Placenta expelled at 6. p.m. with normal loss.
Duration, 4 hours.

Amnesia was surprisingly good considering the small dose of nembutal and I feel sure that this method was of considerable assistance in conserving her energies. No ether was given by inhalation which, in the circumstances was very desirable. She slept well after the labour and looked remarkably well next morning.
She did not gain weight during her convalescence and the outlook is a bad one.

Class B.

Case 5.

Mrs. Lycett, aet. 36, 8-grav. full term, normal pelvis, vertex, L.O.A.
Pains commenced at 5. p.m. and became strong at 6. p.m., cervix admitted 3 fingers and was softening. Morphia omitted, and nembutal gr.3 only, given. Pains did not appear to be affected nembutal gr. 1½ repeated at 7. 30 p.m.
Cervix fully dilated at 8. p.m. when E.O.Q. given. No interference with contractions, patient did not appear to be relieved as much as was expected. Spontaneous delivery, 8. 40. and placenta expelled at 9. 10. p.m.
Weight of baby, 6 lbs. 10 oz.
Duration, 4 hours.

Slight relief only was experienced in this case, probably due to omission of morphia, as a quick labour was anticipated.
Some of the later cases of this series received sodium amytal instead of nembutal, with more satisfactory results.

Class C.

Case 6.

Mrs. Beeston: aet 23, 2-grav., full term, normal pelvis, vertex, R.O.A.
Admitted with slight ante-partum haemorrhage which subsided in a few days with rest in bed.
Labour commenced 10. 15. p.m. pains strong and regular. membranes ruptured at 10. 30 p.m. sodium amytal gr. 6 given at 10. 45 p.m. Pains continued strong and patient rather restless and crying out. E.O.Q. administered at 11. 30 p.m.patient much quieter and dozing between pains. Spontaneous delivery 1. 15 a.m. baby crying lustily.
Placenta expelled 1. 30. a.m.
Duration, 3 hours.

Recollections were extremely hazy. Patient did now know she had had a baby until she woke up for a drink at 4. a.m. Was asleep most of the time during labour but was able to co-operate.
This case fully confirms the observations made about the previous case.

Class A.

Case 7.

Mrs. Jamson. aet. 22, 2-grav., full term, large pelvis, P.N.R. $4\frac{1}{2}+$, vertex, R.O.A.
Admitted with slight swelling of legs and vomiting. She was slightly husky and a few fine crepitations were heard in the left lung in front. B.P. 100/80, no sputum. Pains commenced 2. p.m., when the os was well dilated and sodium amytal gr. 6, given without morphia. Pains continued strong and patient was very short of breath. Blood pressure was not taken but pulse was 94 and foetal heart 140.
It was carefully considered whether E.O.Q. should be given but it was decided that the soothing effect would be beneficial and preferable to inhalation, should this prove necessary. It was accordingly given at 3. 45. p.m. and occasioned no anxiety, the baby being born at 5. 8. p.m. (5 lbs.10 oz.) with slight asphyxia. It was revived with slight stimulation.
Duration 3 hours.
Patient left hospital unexpectedly at the end of ten days and I was not able to obtain a specimen of sputum but think she was an early case of tuberculous laryngitis.

She stated that she remembered a considerable amount of pain but it was much easier that her first confinement.

Class C.

Case 8.

Miss Jones. aet 16, primip., full term, well made and looked much older, P.N.R. 4½+, Vertex, R.O.A. Labour commenced 11. a.m. with strong pains, 3 minute intervals, nembutal gr. 3 given without morphia as I anticipated a quick labour.
Patient was rather difficult to manage and did not get much relief.
3. p.m. E.O.Q. given, patient dozed between pains which continued strong. Spontaneous delivery at 5. p.m. baby weighing 7 lbs. and crying at once. Small perineal tear and one suture.
Duration, 6 hours.

Not a very good case as she appeared to feel and remember all the pains before the E.O.Q. She was very hazy about the pains after the administration but I imagine she felt a good deal.
The case would have been more succesful if morphia had been combined with the nembutal, but with her large pelvis and strong initial pains I thought it would be unsafe to give it.

Class C.

Case 9.

Mrs. Berry, aet. 38, 9-grav., full term, normal pelvis, vertex, R.O.P. mental condition very poor.
Admitted 2 a.m. having been in labour since 10 o'clock the previous evening.
She was in a very wild and demented state, resisting examination and most difficult to manage Cervix 3 fingers dilated, and head not engaged.
Owing to her wild condition, morphia gr. ¼ given at once and at 3. a.m. she was much quieter. Nembutal gr. 3 now given, she

continued to doze between pains.
Cervix now fully dilated and pains strong and regular. At 4. a.m. E.O.Q. administered.
Patient remained moderately quiet.
The head came down well baby was born spontaneously at 5. 20 a.m. occiput having rotated naturally. There was a large caput and child in state of white asphyxia.
24 hours afterwards it commenced with convulsions which were continuous until it died three days later. Weight 8 lbs. 8 oz.
Post mortem not obtained.
Cause of death was intra-cranial haemorrhage and it would hardly be fair to attribute this to the E.O.Q. technique.
It is just as likely that the posterior position and the large caput were sufficient cause.

The amnesia and analgesia were good; it was very striking to contrast the behaviour of the patient before and after the administration of the E.O.Q.
Her mentality being much below the average, it was difficult to assess the amount of amnesia from her answers but her behaviour clearly proved that she had had great relief.
Duration in hospital 3½ hours, total 7½ hours.

Class B.

Case 10.

Mrs. Battison. aet. 27, 5-grav., normal pelvis, vertex, R.O.A., extensive varicose veins of both legs and labia.
Pains commenced at 11. 15. p.m. strong and frequent. Os admitted three fingers.
Sodium amytal gr. 6, followed by E.O.Q. 15 minutes later.
Pains continued severe, patient was very noisy but was sleepy during the intervals.
No further vaginal examination was made and she was obviously coming on well.
Baby was born spontaneously at 1. 30 a.m.
Placenta was expelled naturally with normal loss. Duration 2¼ hours.

When questioned next day she remembered very little which was all the more striking

as she was one of the noisiest of the series.

Class A.

Case 11.

Miss May. aet. 15, primip., full term, pelvic measurements small but head entered the brim. Vertex, L.O.A.
This was a police case, as her father was supposed to be responsible for her condition. Pains commenced at 12 midnight, of slight severity. Cervix admitted one finger.
At 5. a.m. nembutal gr. 3 with morphia 1/6 gr. given. Pains apeared to be eased, contractions continued good. Cervix fully dilated by 7 a.m. when E.O.Q. given. Spontaneous delivery at 9. 10. a.m. with slight internal laceration and perineum swollen and oedematous.
Duration 9 hours. Baby small weighing 5 lbs. 14 oz. but appeared healthy and unfortunately lived and gained weight during its stay in hospital.

Amnesia and analgesia only fair, probably due to the small dose of morphia.

Class B.

Case 12.

Miss. Potts. aet. 19, primip., full term, normal pelvis, vertex, R.O.T.
Labour commenced at 1. 30 a.m. with slight pains which became severe at 3. a.m. Nembutal gr. 3 and morphia gr. ¼ given.
At 5. 30 a.m. as pains were still strong Repeated dose of nembutal 1½ gr.
On examination, a good deal of cervix to be taken up.
Patient now slept at intervals until 10 a.m. when pains again became insistent.
Another dose of nembutal gr. 1½. given by mouth and patient became drowsy again.
At 5. p.m. cervix was fully dilated and E.O.Q. given. Pains became less strong but she became much quieter. No distinct

advance was made for the next three hours and a second instillation of E.O.Q. was given at 8. p.m. At 9. 30 p.m. as head was well down, Pituitrin, ½ c.c. was injected and pains increased in strength with head showing at the vulva.
Baby was born at 10. p.m. crying lustily and perineum was intact. Weight 7½ lbs.
Duration 21 hours.
This labour could possibly have been terminated earlier by forceps, but the maternal condition was good and the foetal heart, 128.
It was the longest case of the series and in every way satisfactory.

Amnesia was good, and her condition at the end of the case excellent.
She remembered seeing me in the morning at 10 o'clock but did not remember me in the evening at 8. o'clock.
The length of labour was probably due to the fairly long rotation of the occiput.

Class A.

Case 13.

Mrs. Cooper. aet. 36, 2-grav. full term, diagonal conjugate 4 inches, vertex, R.O.P.
Labour commenced at 10. 30 p.m. cervix soft, os admitted two fingers, vertex not engaged, nembutal gr. 3 given with morphia, gr. ¼, patient slept most of the night, pains occurring at 15 minute intervals. As she was not complaining much she was left undisturbed until 7. a.m. when nembutal gr. 1½ was repeated.
Examined at 10. 30 a.m. cervix fully taken up and E.O.Q. given. Pains continued every three minutes of strong character but with no advance of the head
At 12 noon light ether given by inhalation head manually rotated into the L.O.A. position and left to deliver herself.
Good progress was then made, head coming down to the perineum where it remained.
1. a.m. Pituitrin, ½ c.c. given and at 1. 20 a.m. the head was born, baby cried normally, there was no difficulty with the placenta and normal loss.

Possibly this head would have rotated spontaneously in time but the mother's condition justified interference.

Amnesia was again good, she slept most of the night only awaking when the pains became more severe. After the repeat dose of nembutal she again became drowsy and whilst she appeared rather restless and cried out during the pains she remembered nothing after the rectal instillation and did not know she had had a baby until some hours afterwards. Duration 14½ hours.

Since the inhalation ether was given 1½ hours before delivery, to correct an obstetrical difficulty, I feel justified in allocating this case to

Class A.

Case 14.

Mrs. Anthony. aet. 25, admitted as full term but actually only 36 weeks. Primipara.
Examined at ante-natal clinic by an outside Authority and recommended for Caesarean Section at term. Diagonal conjugate, 3¾ inches, vertex, L.O.A.
Admitted in labour, 9. 45 p.m.
On examination, head appeared to be very small, and as there was some doubt at to the correctness of her dates it was decided to allow labour to continue naturally.
P.V. os size of five shillings, cervix soft, having good pains, nembutal gr. 3 with morphia, 1/6 gr. given. 10. 30 p.m. cervix fully dilated and living female child weighing 3 lbs. 8 oz. born at 11. 30 p.m
Placenta and membranes expelled intact at 11. 45 p.m., and two sutures inserted into perineum.
Baby was feeble and cried weakly but gradually improved in appearance; there was no asphyxia.
Duration, 2 hours (in hospital)

For the first half hour patient was rather restless and tossed about but then appeared to settle down and slept between pains. Her sufferings did not appear to be acute during the whole labour, which was much quicker than I anticipated.

Probably a better form of treatment would have been the omission of the preliminary morphia and the administration of sodium amytal and E.O.Q. simultaneously.

When questioned afterwards, she admitted feelings pains of a mild character previous to the administration of the E.O.Q. but did not remember anything afterwards, even the insertion of the perineal sutures.

Class B.

Case 15.

Mrs. Ellis. aet. 42, 9-grav. full term, normal pelvis, breech. Lived in a caravan with six children and sent into hospital by the police. Admitted at 12 midnight with two finger os. Advised Sister to give nembutal gr. 3, with morphia gr. 1/6 and report progress. At 5. a.m. was informed by telephone that cervix was fully dilated and breech appearing at vulva. On arrival 10 minutes afterwards the legs and buttocks had just been born. An examination revealed deficiency of the lower dorsal and lumbar spinal processes. Abdominal examination disclosed the existence of a very large head which could never by any chance, enter the brim. As a temporary expedient, pending the arrival of assistance, and as the pains were continuous, E.O.Q. was given. The pains gradually ceased and she became quiet. My assistant having now arrived, the base of the skull was perforated, the head collapsed and after a little difficulty, assisted by supra-pubic pressure the child was extracted, 6. 30 a.m. Inhalation ether was given during this procedure.
Duration in hospital, 6½ hours.

Patient was oblivious from 5. 30 a.m. and very hazy about the happenings before. The effect of the E.O.Q. was striking, Before its administration she was noisy restless and obviously suffering greatly, but in a very short time she became quite quiet. Recovery was uneventful and complete.

Class B.

Case 16.

Mrs. Johnson, aet. 26, primipara, one week post mature, normal pelvis.
Ante-natal examination revealed a mass in the pelvis corresponding to the head.
X. ray examination showed an anencephalic foetus in the R.O.A. position.
Medicinal induction was performed at 7. a.m. Pains commenced at 3. p.m. and by 4. p.m. were strong and regular.
Nembutal gr. 3. given orally with little relief. At 4. 30 p.m. nembutal gr. 1½. with morphia gr. ¼ hypodermically.
Patient was a little restless and still complained of pain, no examination was made vaginally. At 5. 30 p.m. as pains were still severe, E.O.Q. given and a few minutes afterwards patient ceased complaining and went to sleep. At 6. 30 p.m. she was still sound asleep, breathing slowly, pulse 72 and colour good.
B.P. was 110/70 and conjunctival reflexes were present.
Pains became less strong and by 7. p.m. has ceased completely. Patient was still in a sound sleep but she responded to severe pinches and to tickling the soles of her feet. Nothing was done until 8. p.m. when she commenced to move about, this coinciding with the onset of fresh uterine contractions.
As no further advance took place and the presenting part was well down, pituitrin ¼ c.c. was given with a corresponding increase of pains and the perineum began to bulge.
Another ¼ c.c. of pituitrin was then given but there was no further advance.

At 9.p.m. under light ether, forceps were applied but owing to the shape of the head little traction could be obtained, however, by careful manipulation, assisted by supra-pubic pressure the head was extracted and with considerable difficulty, the shoulders were next delivered.
Weight of child. 7½ lbs. perineum was intact and placenta was expelled normally.
Duration 6 hours.

I left at 9. 30 p.m. with the patient fast asleep. Next morning she stated that she woke up at 3. a.m. not realising that she had had her baby; the last thing she remembered was the injection at 5. 30. since then her mind had been a blank.

This case, although a perfect result as regards relief of pain to the mother gave considerable anxiety to the Staff; there is no doubt that the nembutal, repeat dose, morphia and rectal instillation were given too close together, the cumulative effect causing the deep sleep and the consequent cessation of the pains.
The nembutal and morphia should have been given earlier, or the rectal ether later; in fact it would have been better to have dispensed with the morphia altogether, but in this case the relief to the mother was the primary consideration.
As the child was a monster, I do not think that the delay caused by the cessation of pains of any great moment but the sleep was too deep to be pleasant and the co-operation of the mother was absent. A vaginal examination at 3 p.m. would have been of undoubted assistance as I feel that there was then considerable dilatation of the cervix, in spite of her statement that the pains were not severe. This rather discounts Mc. Cormick's claim that it is comparatively easy to judge the extent of cervical dilatation by the severity of the pains.

Class B.

Case 17.

Miss Darby. aet 25 , primipara, full term, normal pelvis, vertex, L.O.A.
Labour commenced 1. p.m. os size of five shillings. Nembutal gr. 3 with morphia gr. ¼ given, patient dozed intermittently.
5. p.m. nembutal gr. 1½ given.
Cervix fully taken up at 6. 30 p.m. and E.O.Q. administered.
Patient sleeping peacefully between contractions, spontaneous delivery at 8. 30 p.m. with rather severe perineal laceration, which required three sutures.
Duration 7½ hours.
Amnesia and analgesia both appeared good but her mentality was much below normal, she said she did not remember being stitched.

Class A.

Case 18.

Miss Stewart; aet. 28, primipara, full term, normal pelvis, vertex, R.O.A.
Labour commenced 12 midnight, but pains were not severe until 2. a.m. when cervix was three fingers dilated.
I was informed by telephone and ordered nembutal gr. 3 and morphia, gr. ¼.
Patient was drowsy but restless during the pains and at 4. 30 a.m. nembutal gr. 1½ were ordered.
E.O.Q administered at 6.a.m., patient slept between the pains baby weighing 7 lbs. 12 oz. born at 10 a.m. with normal loss.
Duration, 10 hours.

This was a very good case, the patient being a well educated and intelligent woman and co-operated well. When questioned afterwards, she stated " Although I was conscious of some of the pains, they were so numbed and far away as to be bearable, I felt the baby being born but it was not half so bad as I imagined"

Class A.

Case 19.

Miss Harris. aet. 33, primipara, 34 weeks, normal pelvis, breech, L.S.A.
Admitted in labour with membranes ruptured and history of having had pains since 1. p.m. i.e. six hours previously.
Os size of five shillings, strong pains occurring every three minutes.
Nembutal gr. 3 given without morphia.
Patient was very hysterical and cried a good deal and had to be dealt with very firmly.
E.O.Q. given at 7. 30 p.m. when she quietened down a good deal.
Baby was born easily at 8. 30 p.m. but never breathed, in spite of carbon dioxide and usual methods of stimulation. Weight was only 3½ lbs.
Placenta and membranes born naturally and perineum intact.
Duration 1½ hours (in hospital).

It is difficult to say whether the nembutal and E.O.Q. played any part

in the loss of this child, as it was premature and a breech presentation. The foetal heart was rapid, 144, at 7. p.m. and it is very doubtful if the baby would have lived even if the method had not been used.

Amnesia also was not good, as the mother was a poor subject, nervous, highly strung and upset at coming to hospital, in addition to feeling her position acutely.

Class C.

Case 20.

Mrs. Cooke. aet 21, primipara, full term, contracted pelvis, diagonal conjugate, 3¾ inches? but outlet normal, sent in as as "? Caesarean section".
Ante-natal examination revealed head freely floating above brim but under anaesthesia could just be made to enter.
Medicinal induction commenced at 7. a.m. but no result until the following day, when cervix began to soften, pains commenced and membranes ruptured naturally at 12. 30 p.m.
Pains continued slowly until 5. 45 p.m. when nembutal gr. 3 and morphia ¼gr. were given. Pains became much stronger cervix fully dilated and E.O.Q. given at 6. 15 p.m.
Patient became drowsy and head slowly advanced.
7. 30 p.m. Head had reached the perineum where it was delayed. As no further advance had been made in an hour, forceps were applied and a living child was delivered, with preliminary episiotomy. Weight 6 lbs. 8 oz.
Light ether inhalation.
Placenta and membranes expelled intact at 9. 25 p.m. and one suture inserted in the perineum.
Duration 8 hours.

Amnesia fairly good, was dozing most of the time up to administration of E.O.Q. after which she remembered nothing until she awakened next morning.

Class B.

Case 21.

Mrs. Chambers. aet. 19, primipara, full term, breech, prolapse of cord,
Summoned by Midwife Bexon at 10. p.m. on emergency form.
On examination, loop of cord was presenting in vagina, cervix three quarters dilated with foot presentation.
Uterine pains strong, every three minutes and at attempt to replace cord failed.
As enema had just been given by nurse E.O.Q. given without preliminary narcotic. In a few minutes patient became sleepy and drowsy but cried out with each pain. Cervix fully dilated at 10. 30 p.m. and patient vomited a large amount of brownish fluid, probably tea.
A foot was brought down, followed by the other, the breech was delivered to the umbilicus.
Gentle traction enabled the posterior shoulder to be freed followed by the anterior shoulder. Body of child wrapped in hot cloths and loop of cord carefully watched for pulsation.
Head gently extracted by Smellie grip, baby born rather blue but soon regained normal colour and began to cry. (10. 45 p.m.)
All this time the patient protested and cried out but it was noticed that when the manipulations ceased, she was soon asleep again.
The placenta was manually expressed at 11. 15 p.m. and perineum was intact.
After perineal toilet, patient was asleep again and did not see me go at 11. 30. p.m.
She stated afterwards that "I seemed to feel the pain but they were far away, I felt I had to bear down.
I did not hear the baby cry".
Temperament ideal as she was of a calm and quiet nature.
Duration. ¾ hour.

Class A.

Case 22.

Mrs. Robinson. aet. 30, 3-grav., full term, normal pelvis, vertex, R.O.A.
Pains commenced 12 noon, os patulous, cervix softening, no advance during afternoon and pains ceased about 5 p.m. Pains recommenced at 7. p.m. and sodium amytal, gr. 6, given by mouth. Patient restless until 8. 30 and then settled down.
Vaginal examination at 9. 30 p.m. cervix not much softer, os the size of five shillings. Morphia gr. ¼ given and patient told to settle down for night. Slept all night pains recommenced at 6. a.m. ten minute intervals. Examined abdominally at 12 noon and head still well above brim. Sodium amytal, gr. 6 repeated, contractions occurring at four minute intervals but patient not complaining. At 2. p.m. she was fast asleep and continued to doze till 3. p.m.
She was now allowed to speak to her husband in the adjoining side ward on urgent family business and subsequently walked back to the Labour ward.
At 4. 30 p.m. she asked for the bed pan had one long contraction and the baby was born.
No E.O.Q. was administered or appeared necessary.
I saw her at 4. 45 p.m. and asked her why she did not complain to the Sister who was in the Ward the whole afternoon. Her reply was that she shouted all afternoon and nobody would attend to her. She also stated that she had only one pain and that was when she wanted the bed pan.
She was questioned the next morning and refused to believe that she had spoken to her husband , in fact she could remember nothing that happened the previous afternoon and as she was an intelligent woman there was no reason to disbelieve her statement.

This case also supports my contention that the patient's complaints are no criterion of cervical dilatation. It also indicates that sodium amytal does exert some effect in the relaxation of the cervix and lower uterine segment. It cannot be claimed as a good result for E.O.Q. but is a convincing argument in favour of amnesia conferred by sodium amytal. Duration 11 hours.

Class B.

Case 23.

Mrs. Phyllis. aet. 23, primipara, 38 weeks,
generally contracted pelvis, diagonal
conjugate 4 inches, vertex, L.O.A.
Sent in an "Query Caesarean Section".
On examination head was just not able to
enter brim but it was believed that if
induced at once with moulding, the head
would just be able to pass through.
Medicinal induction performed at once with
no results the same day.
The next day the cervix was softening and
os admitted one finger easily.
Membranes ruptured early morning but no pains.
Slight pains commenced at noon becoming
regular every ten minutes by 1. p.m.
Rectal wash out given at 1. 30 p.m. and
pains becoming stronger by 3. p.m. nembutal, gr.3
with morphia gr. ¼, given.
Patient much quieter at 4. p.m. with pains
still regular.
Cervix nearly fully dilated at 6. p.m. and
E.O.Q. given. Pains continued strong and
regular at three minute intervals but by
6. 30 p.m. they appeared to slacken a little
and patient became very drowsy.
This continued until 8. p.m. when head was
still above the brim and considerable
head moulding.
10 p.m. head through brim, patient making a
lot of noise and pains very strong.
Foetal heart 130.
10. 30 p.m. second instillation of E.O.Q.
but some difficulty was experienced in
getting the catheter passed the head and it
was not all retained.
10. 30 to 11. 30 p.m. patient very noisy
and complained that she could "stand no more"
Head on perineum and foetal heart 148.
Light ether administered, baby delivered by
low forceps, cyanosed and breathing very
shallowly. Responded to hot baths and
carbon dioxide. Preliminary episiotomy
repaired with one suture.
Duration 12 hours.
Amnesia was good considering the
trying nature of the case.
When questioned next morning she stated she
did not wake until 3 a.m. and was very
muddled about the previous day. Her own
words were:- "I remember the pains starting
about 12 then I went to sleep in the afternoon
after nurse had given me some medicine. I
woke up at tea time and had some tea, I
seemed to remember pains coming on after tea
and someone coming and putting a mask on my
face"

She had not the slightest recollection of my visit and examination at 8. p.m. but appeared to remember the period about 10. 30 most clearly. This period coincided with the second instillation which was not very effective. This is a good example of its utility in cases of dystocia and it is difficult to believe that she would have done so well without its help.
The baby weighed 6 lbs. and there was pronounced moulding.

Class B.

Case 24.

Mrs. Winfield, aet. 26, primipara full term (?), pelvic measurements small, presentation not determined.
Attended at Sherwood Rise Maternity Home.
I was asked to see her by a Nurse as she could not pick up the heart sounds.
On examination she appeared about 32 weeks pregnant although she was supposed to be due in two weeks.
I could not feel the head on abdominal examination either at the brim or fundus.
No limbs could be felt and the mass appeared to have no form. No foetal heart sounds could be heard.
Pains were occurring every fifteen minutes, and were of average severity.
P.V. cervix was softening but there was practically no dilatation.
A tentative diagnosis of a dead macerated foetus was made and the husband informed accordingly. Nembutal gr. 3 and morphia gr $\frac{1}{4}$ were given at once with instructions to repeat the nembutal gr. $1\frac{1}{2}$, in two hours if the pains were not eased.
At 6. p.m. (i.e. 4 hours later), pains were increasing with considerable softening of the cervix and slightly increased dilatation. Two more capsules were left with instructions to give one at 9. p.m. and one at midnight.
At this time, I again saw her and found she was advancing slowly but very drowsy.
I received an urgent call at 4. a.m. and on arrival found the foetus, placenta with amniotic sac delivered and intact.
As patient was sleeping peacefully the Matron went to bed, not expecting to be called again for some hours; patient

dozed most of the night but complained to the night nurse at 3. 30 a.m. and at 3. 45 a.m. the foetus was expelled. When asked why she had not called for the nurse before, she stated that she only one big pain at the end.
Duration 16 hours.

The next day, she said she could remember nothing clearly, she did not remember seeing the Doctor at 6 p.m. or at Midnight. She remembered the baby coming when she had a bearing down pain.
As she was a trained nurse, her answers could be relied upon.
Her temperament was calm and even.
This case is not strictly comparable with the others as E.O.Q. was not given.
It also illustrates the difficulties of its administration in private practice and of judging cervical dilatation by the intensity or triviality of the pains.
In spite of the absence of E.O.Q. the amnesia was surprisingly effective.

Class B.

Case 25.

Mrs. Mc. Donough. aet. 23, primipara, full term, contracted pelvis, vertex, R.O.P.
Case attended at Highbury Nursing Home, Bulwell. Examined at 11. a.m., head engaged, cervix soft, os admitted two fingers, pains slight every ten minutes.
Nembutal gr. 3 and morphia gr. $\frac{1}{4}$, given.
1. 30 p.m. pains increasing slightly but no further dilatation.
Nembutal gr. $1\frac{1}{2}$ given, with instructions to repeat in two hours if patient uncomfortable. Patient dozed and slept all afternoon. 6. 30 p.m. head advancing slowly, cervix nearly fully dilated, nembutal gr. $1\frac{1}{2}$ repeated.
9. 30 p.m. os fully dilated, large caput formed but head still not through the brim.
E.O.Q. administration attempted but impossible to pass the catheter.
10 p.m. inhalation ether and forceps applied . With considerable difficulty head was delivered in partially rotated position with severe perineal laceration, necessitating four sutures.

Brisk post-partum haemorrhage due to partially retained placenta which was manually expressed with considerable difficulty.
Baby had severe head moulding, large caput and was only revived after prolonged attention.
Duration of labour: 12 hours.

Amnesia was only fair and in the absence of the E.O.Q. must be regarded as a failure.
In view of the pelvic measurements, a better result would have been obtained by induction at the 38th. week.

Class D.

Commentary.

An analysis of this series brings out two interesting features, firstly the large proportion of abnormal cases and secondly, the high percentage of primiparous unmarried girls. These facts undoubtedly tend to affect any calculation based upon the figures obtained from a different type of hospital.

The number of single girls was six or 24%; the youngest age was 15 and the average 20.

Obstetrically there was little difficulty but temperamentally the sedative effect of the drugs was adversely affected, owing to the nervousness, lack of confidence and hysteria consequent upon their unmarried state. The most difficult cases belong to this group, many of whom required very firm handling.

The percentage of primiparae was 60% and multiparae 40%. The average age of the series was 26, the oldest being 42 and the youngest 15.

22 were full term and 3 were respectively 34, 36 and 38 weeks.

The duration of labour varied from 1¼ hours to 21 hours, the average duration was just over 8 hours, ranging from 9 hours in primiparae to 6½ hours in multiparae.

50% of the cases were sent in in labour and no opportunity for ante-natal care was available. Of the remainder, several had some slight defect associated with their condition, e.g. ante-partum haemorrhage, glycosuria or albuminuria and were treated on usual lines.

EFFECT ON LABOUR.

(a) Deliveries.

Spontaneous.	Instrumental	Precipitate	Cessation of Pains.
20	4	1	1

(b) Maternal effects.

Restlessness & Noisiness	Vomiting	Slowing of Contractions	Perineal Lacerations
6	2	5	8

(c) Effects on Child.

Slight Asphyxia	Moderate Asphyxia	Deaths.
2	2	0

The number of abnormal cases was just over 50% and and was divided into:-

Contracted pelves	5	(including 2 R.O.P)
Breeches	3	
Hydrocephalus	1	
Anencephalic	1	
Footling & prolapse of cord	1	
R.O.P's	2	
	13.	

In addition, there were two cases of pulmonary tuberculosis and one of toxaemia which increases the percentage to 64%.

In three cases the pelvic contraction was of extreme degree and were sent in as requiring Caesarean Section but of these, two commenced labour, not later than the 38th week and the

other was delivered by low forceps.
The breeches occasioned no anxiety as regards the mother but one baby was rather blue.

Two of the R.O.P's rotated spontaneously, one was manually rotated the other had partially rotated and was terminated by forceps.

I am firmly of the opinion that this method of analgesia was of the greatest possible advantage in the trying and long drawn out labours associated with these particular types of dystocia.

Forceps.

Four cases required interference and termination by forceps, but this was accounted for by obvious obstetrical abnormalities.
This average cannot be considered high, considering the exceptional type of cases, interference being necessary to preserve the maternal organism or on account of foetal distress.
In two cases the anaesthetic effect of the rectal injection was sufficient to carry out the operation without supplementary inhalation ether and the patients had no recollection of the procedure afterwards.

Restlessness and Noisiness.

Restlessness is a usual feature of labour and it is only when it occurs in an aggravated form that it can be fairly criticised. Six cases were either extremely restless, noisy or hysterical and required the attention of more than one nurse.
The amount of noise is no true criterion of the method as some of the noisiest patients had the most complete amnesia afterwards.
The exceptional degree of restlessness usually associated with sodium amytal was not experienced, possibly because the large doses recommended by other investigators were not used.
The administration of the E.O.Q. mixture acted like a charm and soon afterwards, the patients were quiet and peaceful.

This was one of the most striking characteristics of the series. Sodium amytal was given in five cases with no ill effects on the mother or slowing of uterine contractions, in fact, one case of pricipitate labour occurred.

In only one case was it associated with foetal embarassment and here the condition of the mother was a contributory factor.

Vomiting.

This only occurred in two cases. In one case pt. had returned from a Dance two hours before the baby was born. When it occurs it is generally soon after the rectal instillation and is said to be a reflex phenomenon due to a reversed peristalsis.

Effect on contractions.

Contrary to what I had been led to expect, there was decided slowing of the uterine contractions in 24% of the series. It usually occurred soon after the rectal instillation and lasted from half an hour to two hours, being more pronounced when the preliminary nembutal and morphia had been recently given. Complete cessation occurred in one case and was unquestionably due to faulty technique. This slowing may not always be a disadvantage in that it affords a little rest to the mother in long tiring labours, provided that it has no adverse effect on the child. It is sometimes a little trying to the Staff. I have not hesitated to repeat the instillation when the pains have become fully established again. In the absence of definite rules for the timing of the various administrations mistakes are bound to be made in judging cervical dilatation and instillations may be given too early or too late with corresponding effect on the contractions.

It becomes easier however, with experience and is not an insurmountable objection.

Hastening of the pains has not been observed but precipitate labour occurred in two cases, one being associated with sodium amytal in a full term multiparous patient and the other with nembutal in a premature dead foetus. In neither case was there time to give the rectal instillation nor to make a vaginal examination, the Staff being deceived by the absence of complaint or any difference in the patient's behaviour.

Perineal lacerations.

There were eight cases, two of moderate severity requiring three and four sutures respectively. Three required no supplementary anaesthetic and had no subsequent recollection of the operation.

Inhalation Anaesthesia.

Ether only was administered to the five cases requiring it, chloroform being definitely contra-indicated in this particular form of analgesia. Again, it was associated with some form of pelvic abnormality which necessitated forceps. The amount of ether used was much less than in ordinary cases, only very light anaesthesia being aimed at. The resulting amnesia and analgesia were extremely good, only the fact of supplementary anaesthetic having to be given, excluding these cases from Class A.

Pituitrin was given in two cases, with resulting increase of uterine contractions. There appeared to be no contra-indication to its use and its administration probably obviated the application of forceps.

Effects on the Child.

Four deaths occurred but three were monsters and the fourth died three days later from intra-cranial haemorrhage. None of these deaths can properly be attributed to the rectal analgesia. Four babies had some form of foetal embarassment, one was a breech in a normal mother and the asphyxia was slight and rapidly passed off. The second, also a breech, occurred in a mother suffering from pulmonary tuberculosis, the baby being very small and weakly. The other two were associated with contracted pelves and required instrumental delivery. Each case could therefore be explained by the concomitant obstetrical abnormality.

Difficulties of technique.

There are one or two minor difficulties which are sometimes annoying but not sufficiently serious to be regarded as drawbacks.

Expulsion of the catheter is probably caused by neglect in passing it well above the presenting part. The tube may disappear eight inches or more in the rectum but curl or kink in which case the presenting part forces out the mixture during a pain. It is desirable to pass the tube before the head advances too far, for once the injection has passed this obstruction it is mechanically prevented from returning.

Soiling of the perineum is very troublesome and occurs when the preliminary washing out of the

bowel is incomplete. It also occasionally occurs when the head is being born especially when the rectal instillation has been administered too recently. It can usually be prevented by the proper application of a suitable pad.

It is essential to keep a pad on the rectum for ten to fifteen minutes after any instillation, otherwise a thin faecal stream is extruded.

The solution must be freshly made up. If left for a few days in an ordinary container the quinine tends to crystallise out or be precipitated. Quinine sulphate and quinine hydrobromide both act in this way and several mixtures had to be discarded. Quinine alkaloid appears to be more stable and it has been used in the later cases. E.O.Q. mixture is now made up in ether-tight containers by Messrs. E.R. Squibb & Sons, of New York and the Abbott Laboratories of North Chicago but I have not been able to obtain any in this Country.

Soon after the rectal administration the patient begins to exhale ether and the Labour Ward becomes filled with its fumes. This appears a little strange ~~at first~~ especially on first entering the Ward and caused complaints of headaches amongst the Staff but proper attention to ventilation was followed by its disappearance.

No cases of rectal irritation have occurred. Several patients have complained of transient burning during the instillation but have not referred to it subsequently and no untoward effects have been observed. This is all the more striking as several patients suffered severely from haemorrhoids.

AMNESIA AND ANALGESIA.

The results classified according to the Gwathmey technique are as follows:-

Class A.	7	or 28%
Class B.	12	or 48%
Class C.	5	or 20%
Class D.	1	or 4%

As the main distinction between Classes A. & B. is the addition of inhalation anaesthesia the combination of these two groups would give good amnesia and analgesia in 76% of all cases. Considering the abnormal types it would be reasonable to describe the results as good. It is a fair assumption that if the method is good in this class of case it would be even more satisfactory in normal midwifery.

Two cases in Group C. were early ones and the poor results were probably due to insufficient dosage and lack of experience.

In the conduction of cases no alteration was made in the routine management, after the preliminary dose of barbiturate and morphia the patient was encouraged to lie down and go to sleep. Ordinary quiet was insisted upon but no extra precautions as to the shading of lights or plugging of ears were taken, and no case was left after the injection, a sister and a nurse usually working together. In the early cases administrations were personally made but later on were delegated to a sister.

The foetal heart was auscultated hourly and frequent blood pressure examinations made. Pains were timed as to frequency and noted as to strength. Pulse was charted two hourly and observations recorded as to restlessness, thirst, hysteria and frequency of need for catheterisation.

A note of the commencement of labour, rupture of membranes, full dilatation of cervix, birth of child, separation of membranes and total duration of labour was made. Times of administration of drugs and rectal instillation were strictly kept.

Whilst instilling, the patient may complain of a taste of ether but often before the whole instillation is completed she becomes drowsy and later falls asleep. Often she remembers nothing from the time of the first instillation until she awakes when delivery is all over.

Freedom from pain may be from three to six hours and the instillation if necessary, can be repeated at intervals of three to four hours.

The effect of the E.O.Q. was very marked in ensuring a peaceful night and the condition of the mother next morning was extremely good. Twenty four hours after the labour, each patient was questioned in similar terms, as follows:-

" How much do you remember of yesterday?"
"What was the last time you could remember?"
(A clock being in the Ward.)

"Do you remember seeing the Doctor?"
" Did you hear your baby cry?"

The majority were very hazy and hesitating in their answers, requiring deep concentration and much knitting of brows.

Comparatively long periods of time were completely forgotten. Those who remembered the pains, stated that they were "numbed or far away" and multiparous women, who had had severe confinements in the past, confessed that the pains were nothing like so severe.

As a rule the more intelligent patients remembered more clearly and amnesia was not so good; those of poorer mentality seemed to remember less and to have suffered less acutely.

Those of placid and even temperament were better subjects for analgesia than those of a highly strung nature, this being particularly brought out in the group of unmarried girls, some of whom were mentally sub-normal.

The largest dose of nembutal given was gr. 7½ but as the rectal ether could not be given in this case the result was a failure.

The largest dose of sodium amytal was gr. 12 with good result and no prejudicial effects on mother or child.

In the earliest cases, and in cases where greater precautions than usual were necessary, a modified dose of nembutal and morphia was substituted but the resulting amnesia was poor. In the later cases I have not hesitated to push the drugs and the results have improved without increase of anxiety. Mc. Cormick advises doses of nembutal every two hours up to gr. 12 and Dodek's initial dose with multiparous patients is gr. 9, with repeat doses of gr. 6.
So far I have hesitated to adopt such heroic measures.

In future, I propose to give to cases entering hospital early, a preliminary dose of one of the barbiturate group to guard against any idiosyncrasy after which I shall feel confident in pushing the dosage.

The E. O.Q. appeared uniformly safe to mother and child and was given without any qualms.

In conclusion, I can say that after a thorough trial in difficult midwifery, I am convinced that the method has very great possibilities and is worthy of a much more extended trial. It is safe, economical, easy to administer and requires the minimum of skilled nursing and attention. It is particularly adapted to long and difficult labours and the patient's energies are conserved so that she makes a better convalescence. There is no increase in the proprtion of operative deliveries or of still births.

SUMMARY.

1. A series of twenty five maternity cases treated with rectal-ether-oil-quinine in labour is reviewed and discussed in the light of modern practice.

2. Great relief was experienced in 76% of all cases and moderate relief in 20% with one failure.

3. No maternal deaths occurred in spite of the large percentage of abnormal cases and no foetal deaths could be attributed to its use.

4. Its suitability to dystocia, tuberculosis, toxaemia and induction is proved.

5. Labour is not unduly prolonged; it may be hastened but with careful technique rarely ceases.

6. Certain minor objections can be obviated by improved technique and wider experience; they are not in themselves, sufficiently serious to disqualify the method.

7. It is best used in hospital where skilled supervision and attention are available, but, in a modified form can be adapted to Nursing Homes.

8. The physical and mental condition of the patient is improved by the knowledge of ease during delivery, thus ensuring a better convalescence.

9. The admitted enthusiasm of the patient is the best criterion of the success of this method.

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