

ART. XV.—*On the Hydrate of Chloral as a Hypnotic and Nervous Sedative, especially in Gynecological Practice.* By THOMAS MORE MADDEN, M.R.I.A.; Licentiate of the King and Queen's College of Physicians, Ireland; Member of the Royal College of Surgeons of England; Assistant Physician to the Rotunda or Dublin Lying-in Hospital; Corresponding Member of the Gynecological Society of Boston, &c., &c.

HAVING had an opportunity of testing the effects of hydrate of chloral, the new hypnotic and sedative, in a great number of cases, I venture to hope that the following observations, being a *résumé* of my notes of its action in several cases, may be of interest to those who have not employed this new remedy on an extensive scale.

Before entering on the consideration of the therapeutic value of chloral, as exemplified by the cases in which, with the approval of Dr. Johnston, Master of the Rotunda Hospital, I have administered this remedy in the gynecological wards of the lying-in hospital, as well as in private practice, I may premise that having no predisposition in favour of or against the new drug, I have given it a fair trial, and now submit the notes taken as to its effects in some of the cases in which it was administered, whether they be in favour of or against the supposed value of this addition to our therapeutic resources.

In many instances, those who have taken an active part in introducing new remedies into practice appear to have fallen into the not uncommon error of taking the *post hoc* for the *propter hoc*; and the experience of any one conversant with periodical medical literature, for even a few years past, will find highly educated and accomplished physicians extolling the virtues of novel medicines, which, within a very short time, have fallen into well-merited disuse. The confidence of the physician who administers a new drug of supposed extraordinary powers in the novel remedy is oftentimes reflected by the patient, who, being perhaps minutely questioned as to the effects which it was hoped might be produced by the medicine, begins to imagine what he wishes may be truly effected by the curing pill or potion; and, such is the wondrous power of the imagination over bodily sensation, that he oftentimes feels for the moment all the benefits which have been ascribed to the medicine, and unconsciously deceives his physician as well as

himself. Anxious to avoid this error, I have endeavoured to test the new remedy, so as to exclude, if possible, this source of fallacy. I have, therefore, in a certain number of cases, first given the narcotics and sedatives usually employed, and have then compared their effects with those of hydrate of chloral, without letting either the patient or nurse know of the change of medicine, and I have then given some inert substance in draughts similar in form and taste to those previously prescribed, and had them administered with all the formalities with which the patient had been familiarized when taking the chloral for the purpose of the experiment; and I have thus been able to say how far the phenomena that followed were really produced by the medicine administered or not.

The great number of alleged new remedies which now-a-days are almost daily added to our list of the *Materia Medica*, already as long, and, in some respects, nearly as useless as the catalogue of the ships in the *Iliad*, should act as a preventive to our resorting to medicines simply because they are novel, unless they expressly accomplish new purposes or fulfil more advantageously those already attained; for, the unnecessary multiplication of medicines and preparations, far from adding to the resources of the practitioner, becomes, as Sir Henry Holland justly remarks, "an incumbrance to the practitioner and an impediment to the progress of the science."

Chloral, however, does promise to accomplish new purposes in the hands of the physician, as well as those of the surgeon, and to fulfil more advantageously others already attained.

The effects claimed for chloral by Liebreich, Richardson, and others, are:—1. That it produces sleep. 2. That it brings down the animal temperature. 3. That it removes sensibility. 4. Causes muscular relaxation. 5. Acts with extreme rapidity. 6. Does not require an increased dose to produce its effects, even after long use. 7. Has no counter-indication to its employment. 8. Is not followed by any unpleasant after-effects.

According to Liebreich, the physiological action of chloral is entirely due to the decomposition of the substance in the system by the free alkali contained in the blood, and the gradual formation of chloroform. This theory of the *modus operandi* of chloral has been controverted by M. Demarquay, of Paris, but has been in great measure confirmed by the more recent experiments of MM. Personne and Roussin,\* who have shown that

\* MM. Personne and Roussin, *L'Union Medicale*, Nov. 30th et Dec. 2nd, 1869.

chloral is, in the first instance, decomposed into formic acid and chloroform in the blood.

Chloral seldom produces the preliminary stage of excitement so constantly observed when chloroform is introduced into the system by inhalation; and the fact is thus accounted for by Dr. Liebreich:—"On account of there not being a sufficient amount of alkali in the blood, the formation of chloroform cannot take place, as it were, explosively; on the contrary, each molecule will take up a quantity of alkali from its immediate neighbourhood; and this process can only be finished after the blood has furnished the corresponding amount of alkali. A minimal quantity of chloroform is therefore formed in a unit of time, and acts at first on the ganglia of the cerebral hemispheres, afterwards on the ganglia of the cord, and at last on those of the heart. It is therefore, as it were, the very slowest method of administering chloroform."<sup>a</sup>

I now purpose to lay before the reader the observations I have made as to the physiological and therapeutic action of hydrate of chloral in the cases in which I have administered it.

Chloral is unquestionably a most powerful nervous sedative and hypnotic, but I have not found it quite as certain in its action as I had hoped from reading Liebreich's, Sir James Simpson's, and Dr. Richardson's papers; on the contrary, in some of the cases in which I tried chloral it failed in ordinary doses to produce any effect whatever. The average dose for an adult as an anodyne is from 20 to 40 grs.; usually 30 grs. acts as a full anodyne, but I have found 10 sufficient, and I have given as much as 80 grs. I would not, however, recommend the latter quantity to be rashly tried, as chloral is no mere placebo which, if it does no good, at least can do no harm; on the contrary, it is a substance which requires to be administered with great caution, being capable of acting with extraordinary power on the ganglionic and nervous system generally. Dr. Richardson states that 2 grs. of hydrate of chloral are equivalent in physiological value to 4 grs. of chloroform; and when we bear this in mind we cannot be surprised at the cases recorded by Dr. Noir in the *Gazette des Hôpitaux*, December 22nd, 1869, in which 75 grs. of chloral produced symptoms of a very grave and alarming character.

<sup>a</sup> Dr. Oscar Liebreich, "On Hydrate of Chloral, a new Hypnotic and Anesthetic." Berlin: 1869. See also Dr. Dobell's Report on the Progress of Practical Medicine, p. 227. London: 1870.

The case in which I gave 80 grs. of chloral, as will be seen when I come to refer to it presently (see Case VII), was of a very exceptional nature, and one in which I had very cautiously given the medicine in gradually increasing quantities from a very small to a very large dose. I have frequently found 10 grs. of chloral quite sufficient to cause the almost immediate cessation of violent uterine pain, and sometimes even to produce some three or four hours' sound sleep in cases which had resisted full opiates.

One of the great advantages which chloral possesses over every other hypnotic and nervous sedative is the rapidity of its action. In all the cases in which I have tried chloral, if it had any effect whatever, it was manifested within an hour of its administration; this was the furthest limit, but in the great majority of cases it acted within twenty minutes, and in several cases I have seen sleep produced or pain completely relieved in less than five minutes from the time the dose of chloral was taken.

It has been remarked by some observers that this drug differs from opium and other narcotics in the fact that the same dose continues to produce the same effect for long periods of constant use. This has not been my experience; for in several cases in which I continued the chloral for some time I found it necessary to increase the dose, and that after some time that even large doses failed in their effect.

Dr. Richardson states that the administration of chloral reduces the animal temperature in ordinary narcotism at the minimum  $3^{\circ}$ , and at the maximum  $4^{\circ}$ ; any decrease of temperature below the latter figure being, according to this observer, an indication that the chloral has been pushed to a dangerous extent.\* My experiments, as far as they have gone, have not confirmed this observation. In some cases I have noted a diminution of temperature to the extent of from  $\frac{1}{2}$  to  $\frac{1}{3}$  of a degree produced by the chloral; but in quite as many cases the medicine had no effect whatever on the patient's temperature. I have not, however, pursued my inquiry on this point sufficiently far to enable me to speak with any certainty on it.

The muscular relaxation which, as Dr. Richardson points out, is produced by chloral, indicates the probable value which the surgeon will doubtless derive from this agent in cases in which it is necessary to overcome muscular spasmodic action; and to the midwifery practitioner Dr. Richardson's hint should be of even

\* *Medical Times and Gazette*, Nov. 6th, 1869, p. 567.

greater value than to the surgeon; for, as Sir James Simpson has shown, parturition has come on without any diminution of the parturient force in a patient under the influence of chloral. We have here the hint of a remedy probably of great power afforded us in the treatment of a class of cases in which I believe chloral was never thought of until I tried its effects in the wards of the lying-in hospital—I mean in cases of difficult labour from rigidity of the os uteri and soft parts. I shall now, without further preface, proceed to give the details of some cases in which I employed chloral

CASE I.—*Cancer of the Bladder*.—February 6th, 1870.—K. C., aged twenty, an unmarried girl, who had been admitted to No. 10 ward August 5th, 1869. She had previously been under treatment in Dr. Stevens' Hospital; and when admitted into our chronic ward was suffering from acute pain in the vesical region and incontinence of urine, being unable to retain her urine for more than a few minutes together. The urine was very acid and turbid, containing muco-purulent matter and epithelium; her tongue was exceeding foul; her appetite very poor; her aspect cachetic, not hysterical; and her sleep broken by the incessant pain and necessity for frequent micturition. She was treated as the symptoms rendered necessary, and by various plans in succession, but with the same unsatisfactory result in all—namely, that under each she would generally appear to improve for a short time, and then as certainly relapse again. She continued in this condition for six months, when, the full opiates which she was now obliged to take twice a day to allay the pain, failed in its effects, it was resolved to try chloral, for the first time in this hospital; and accordingly on the 6th of February she was ordered—

R.—Hydratis chlorali, gr. xx.

Mel. despumat, ʒi.

Aquæ cinnamoni, ʒi.

M.—Fiat haustus statim sumendus

Ten minutes before getting this draught she passed water. Just before it was administered at 11:30 a.m. she had intense pain in the bladder, as usual; her pulse was 110, but rather irregular, temperature normal, and pupils natural; she had also a severe headache, which she had complained of for several days. Three minutes after taking the draught she had no pain whatever; ten minutes after—at 11:40 a.m.—her pulse was 104. At 11:50 her pulse was 100, pupils slightly contracted; at 12 noon pulse 96, is

dozing; 12:30, pulse 96, sleeping; 12:40 p.m., woke up for a minute, got up and passed a small quantity of urine. She states that the micturition was not as painful as usual; the time she retained her water was 80 minutes, by far the longest period she had done so since she came into the hospital. At 1 p.m. still asleep; pulse 96. She slept till 2 o'clock, when she awoke, free from pain and no headache. She says she has not had such an interval of complete ease since her admission. At 3 p.m. the pain and frequent micturition returned, though the pain is less severe than usual. At 8:50 p.m., has some pain, no headache; pulse 92; temperature  $100\frac{1}{2}$ , second dose of 20 grs. of chloral given. In ten minutes the pain had ceased, and her pulse had fallen to 88. She did not sleep this night, though she had no pain whatever.

February 7th.—She had 20 grs. of chloral at the morning visit, and slept for three hours after it. At 5 p.m., being in a state of great suffering, rolling on the ground with intense pain in the bladder, 30 grs. of chloral in a draught was given. This, however, only gave her a few minutes' ease, for at 6 p.m. I found her again in great pain, and gave her 35 grs. of chloral.

February 8th.—She tells me the last draught gave her more ease than anything she had yet taken; a few minutes after it she fell asleep, and slept between four and five hours, but awoke in great pain again. At 10:55 a.m. she got 30 grs. of chloral; immediately before taking it was in great pain; countenance pale and anxious; pupils contracted; tongue furred and aphthous; skin cold and clammy; pulse about 88, irregular, weak, and fluttering. Immediately afterwards her pulse became a little stronger and more regular, and the pain appeared to cease instantly. Twenty minutes after is falling asleep; complains of cold; is free from pain; pulse 84. She slept till 2 p.m., awoke crying and nervous; not in pain; appeared stupified by medicine; has not eaten nor taken her wine to-day; has only had to pass water since 11 a.m. At 8 p.m. I was sent for, and finding her again crying with the intense pain in the bladder, gave another draught with 36 grs. of chloral, which, in four minutes, was followed by complete cessation of pain in the bladder, though she still complained much of what she describes as "a queer boiling sensation or pain in the head," over the frontal region. At midnight it was again necessary to repeat the chloral, after which she passed a good night, and was free from pain next morning. The chloral was not continued in this case.

CASE II.—*Odontalgia—Insomnia*.—February 27th.—E. M'D., aged thirty, a woman two days previously confined of her sixth child; was in great pain from violent toothache, which prevented her from sleeping since her confinement. She was in a semi-febrile condition from the pain; her pulse about 100; I gave her 15 grs. of chloral in a draught; this gave her immediate ease, and within a few minutes produced sleep, which lasted for three hours. She awoke talking incoherently for a few moments, but continued free from pain.

CASE III.—*Puerperal Mania*.—February 6th, 1870.—An unmarried primipara, who had been delivered five days previously after a natural labour, suddenly became maniacal. As she was being dressed, to lie outside the bedclothes, as is usual, she began to shriek and clap her hands together in a hysterical manner; and after a few moments of violent excitement, became taciturn and refused to speak a word. I was sent for at once, and ordered a draught containing 20 grs. of chloral, which produced no apparent effect. She also got wine and beef-tea. Next day at noon she had an epileptic fit, and fifteen minutes afterwards, finding her very restless, excited, and loquacious, I gave her another draught with 20 grs. of chloral. Her pulse was then 100, and she complained of severe headache. After taking this draught she immediately fell asleep and remained so for four hours, when she awoke in a stupified condition; eyes wild and staring; would not speak. She had wine and beef-tea at short intervals.

February 8th.—Her condition is nowise improved. She continues obstinately silent; pulse small and very rapid; decubitus dorsal; features pinched, and her expression fatuous. Twenty grains of chloral given at the morning visit produced no effect, and at night she had 30 grs. of chloral in an enema, with brandy and beef-tea, but only slept for one hour after getting this.

February 9th.—No change in condition or treatment. She slept that night till 4 a.m.

February 10th.—She has passed from a state of melancholia and taciturnity into one of maniacal excitement and extreme loquacity. At the morning visit I gave her (as I was visiting for Dr. Johnston) gr. xxx. of chloral, which at once subdued the excitement and gave her four hours' sleep, and at night I repeated this dose with the effect of giving her, for the first time since her illness, a whole night of undisturbed repose. Next day she

appeared to be semi-stupified, as if by the medicine; was very depressed and quiet in manner, but refused to speak a word or to take any nourishment or medicine by the mouth, and that day was sent to the Richmond Lunatic Asylum.

CASE IV.—*Insomnia—Threatened Puerperal Mania.*—March 30th.—Ward No. 12.—A woman, aged about forty, unmarried, was delivered of her second child after a natural labour at 10 a.m. She was in great distress of mind; did not sleep for three nights; talked wildly; got out of bed and insisted on going home the day after her confinement; manifested an aversion to the child. On the evening of April 21st she got 20 grs. of chloral, and half an hour after fell asleep, and slept for the first night since her admission into hospital, three days before delivery. Next morning she was much better.

CASE V.—*Puerperal Mania*—February 16th.—A. S., aged thirty-five—ward ; incipient puerperal mania and sleeplessness four days after delivery; was given 30 grs. of chloral at 10 a.m., slept for three hours. At 8 p.m. she had a similar dose of chloral. During the night of the 18th she had an acute attack of puerperal mania, and attempted to kill her child. This was at first treated by bromide of potassium; but this failing, on the evening of the 20th she got 30 grs. of chloral; an hour after which she fell asleep, and had nearly four hours' rest. On the 21st the puerperal mania had subsided.

CASE VI.—*Puerperal Mania.*—March 5th.—I was called, in consultation with Dr. O'Neil, of Earl-street, to see a lady, aged twenty-one, who had been, fourteen days previously, confined of her first child, and had afterwards progressed favourably till the tenth day after delivery, when she was suddenly attacked by acute puerperal mania of a very violent type. When I saw her she had not slept for six nights; was highly delirious; pulse 140, and weak, as she refused to take food. Two drachms of hydrate of chloral, with the same quantity of bromide of potassi, and  $\zeta$ iv. of tinct. of hyosyamus in a six oz. mixture, an ounce of which was to be given every hour, was prescribed. Next day we found her worse; she had spit out the medicine, and had not slept nor took food since. We now gave her enemata of brandy, beef-tea, and 30 grs. of chloral in each, every third hour.



The third enema produced immediate effect, and she had uninterrupted sleep after taking it. The mania, however, still continued, and we found her no better the following day. The chloral was continued till the 9th, when, finding the mania unabated, though she now slept well each night, we agreed to discontinue it, and the following day she was sent to a lunatic asylum.

CASE VII.—*Hysterical Mania*.—March 2nd, 1870.—Ward 11, bed 123.—A patient, aged about eighteen, who had been in the hospital for some days suffering from hysteria, was attacked by violent hysterical mania, which came on quite suddenly this evening about seven o'clock. An hour after the attack I was sent for, and on visiting the ward I found her in such a state of violent hysterical excitement that at the urgent request of the ward nurse and patients I removed her to another ward. Having before given her chloral in smaller doses, I now prescribed:—

R.—Hydratis chlorali, grs. lxxv.

Syrupi, ℥ii.

Aquæ ad., ℥ii.

M.—Fiat haustus statim sumend.

8:25 p.m.—Chloral given. She declared that nothing should induce her to go to bed. With a view of keeping herself awake she paced up and down, and running on meanwhile, as the note made by the pupil who administered the medicine (Mr. E. B. Roche) states, "against the hospital and things in general." After about ten minutes it was noticed that she was walking unsteadily, and in the next few minutes she evidently could not "toe a line." She then began actually to stagger; and as the situation appeared to be suggestive, began to talk of another occasion when she was drunk. She then got into the "maudlin stage," deplored her folly, asked forgiveness; and by taking proper advantage of this state of mind, was induced to return to the much-abused bed. She soon became calm, and slept from 10:30 p.m. till 4 a.m., when she awoke quietly.

March 3rd, 10 a.m.—She wished to go home; and on being advised to remain in the hospital, became again very much excited with hysterical crying, and was ordered 80 grs. of chloral, which was given at mid-day. Her pulse was then 100. At her urgent request her mother was sent for to fetch her home, and on her arrival she insisted on going. She walked about the ward, said the draught should not set her to sleep, and got into a state

of extreme nervous excitement about going home. Gradually, however, she began to reel and stagger in her gait, and protesting that she would not lie down, easily allowed me to put her to bed. Ten minutes after the chloral her pulse had fallen to 88; her pupils were widely dilated; talking in a thick incoherent manner, but much less excited. 12:35 p.m.—Still awake, but very sleepy; can hardly keep her eyes open, though she is trying hard to keep herself awake. 12:40.—Fell asleep, and slept till 4:15 p.m.; very calm, and awoke much more composed. 5 p.m.—She insisted on her mother taking her home; is rational, but very sleepy, and staggers so much that she cannot walk across the ward unaided; appears like a patient suffering from progressive loco-motor ataxy, having no power of co-ordinating her movements. She went home that evening. Some days afterwards she again came under my care, suffering from well-marked hysteria.

CASE VIII.—*Delirium Tremens*.—February 10th.—I was sent for to see a young man who had been drinking hard for several days, but had stopped drinking three days ago and did not sleep since. He was in a state of great nervous excitement; his face pale and anxious; skin cool and moist; pulse quick, small, and compressible; tongue furred and tremulous. His wife informed me that she, her servant, and two friends had passed the last couple of nights keeping him in bed, from which he was endeavouring to escape. He had taken no nourishment whatever for three days; complains of great thirst, which he has been striving to slake by copious draughts of cold water, vomited as soon as swallowed. Ordered milk and soda water in small quantities; and the following draught:—

R.—Hydratis chlorali, grs. xxx.

Potassi bromidi, grs. xxx

Aquæ camphoræ ad., ℥ii.

M.—Fiat haust.

This was given at 11 p.m., when his pulse was 116. In 15 minutes his pulse continued as before; in 30 minutes pulse 102—fell asleep. He slept all night; awoke more tranquil, and took some soup. Next night he had 20 grs. of chloral; slept well, and rapidly convalesced.

CASE IX.—*Insomnia—Tonsillitis*.—February 13th, 1870.—A. N., aged twenty-eight—ward 10—was suffering from anteflexion of the uterus, complicated by acute tonsillitis. Not having slept for

three nights, was ordered 30 grs. of chloral, with a little syrup in three drachms of cinnamon water, as she could not swallow a larger draught. This was administered at 8.15 p.m.; her pulse being then one hundred; twenty minutes after there was no change in either pulse or temperature. She had become very excited—almost as much so as if in the excitement stage of anesthesia by chloroform. She had to be held in bed; talked loudly and incoherently; passed a sleepless night, and next morning complained of headache.

CASE X.—*Acute Pelvic Cellulitis*.—February 23rd.—M. D., aged twenty-four—ward No. 10—a patient suffering from acute pelvic cellulitis. Being kept awake for some nights by the pain, was ordered 30 grs. of chloral at bed-time; this produced no effect, and she passed a sleepless night.

CASE XI.—*Cauliflower Cancer from Os Uteri*.—February 16th.—J. K., aged forty-three, suffering from a large cancerous cauliflower growth from the cervix uteri, which gives rise to intense uterine pain, controlled by opiates. Every night was given 30 grs. of chloral; at mid-day, when in an exacerbation of pain, this produced immediate relief, and she had three hours' sleep afterwards.

CASE XII.—*Irritable Bladder*.—February 23rd.—K. Q., unmarried, aged twenty-eight, a patient suffering from incontinency of urine; is unable to retain her water for more than ten minutes continuously. She hardly sleeps at all, being so frequently obliged to rise to pass water. There is considerable pain and soreness in the urethra and wall of the bladder. The quantity of urine voided at one time is, of course, exceedingly small. She had been previously for some time under treatment, without appearing to derive benefit. With a view of lessening the irritability of the urinary mucous membrane, and diminishing the spasmodic action of the bladder, I determined to try the effects of repeated small doses of chloral, and order a mixture containing 10 grs. to the dose, to be taken every hour. This was of decided use. The irritability of the bladder was greatly lessened. She could keep her water for two or three hours continuously, and slept soundly at night whilst taking the chloral. When it was left off all the symptoms again returned, and were not relieved until we again had recourse to it. There has not, however, I fear, any permanent improvement been effected by the chloral in this case.

CASE XIII.—*Incontinence of Urine.*—February 27th.—M. J., aged twenty-eight, married; has three children; was last delivered in Glasgow three years ago, after a hard labour, and for the last two years has been suffering from incontinence of urine. This is especially troublesome at night; each morning she finds her bed saturated with urine; and, as she told me, her life had become a perfect burden to her in consequence of this infirmity. She complains much of bearing down pain in the back and hips, and also in the vagina. On examination there was no uterine displacement found, and the bladder and urethra were apparently in their normal condition. She was put on 10 gr. doses of chloral, given every third hour, with the effect of completely relieving the incontinence of urine, and allowing her to retain her water all night as long as the medicine was continued, but no longer.

CASE XIV.—*Irritable Bladder.*—April 10th.—Ward No. 10.—A girl suffering from an irritable bladder, with acute pain in the vesical region, was ordered five grains of chloral at 10.35. The patient was then suffering a good deal of pain. Pulse 104.

At 11 o'clock the medicine was administered. In twenty-five minutes the pain was found to be somewhat lessened; the pulse was 96; and although the girl did not lie down she showed unmistakable signs of sleepiness.

Another dose was given, which completely removed the pain, causing decided drowsiness, with some headache.

CASE XV.—*Hysterical Peritonitis.*—K. S., aged eighteen, married, was admitted to 10 ward, February 23rd, 1870. Four months ago she received a kick in the abdomen, and since then she has never been free from abdominal pain. This has been most acute for the last three weeks, and has confined her to bed. For the last three months her appetite has been very bad, and she acknowledges that she has lived chiefly on brandy and whiskey during this time. When she came to the dispensary she appeared half mad with the abdominal pain; could not stand nor answer my questions, and she repeatedly assured me that she had not slept for the last three weeks. The abdomen was small and contracted, the muscles tense and rigid, the lips drawn up, and such extreme tenderness as to render an examination difficult. She was ordered fomentations, poultices, and a draught with 35 grs. of chloral at once, to be followed by a castor oil draught with

tincture of hyosyamus in four hours. At 11:25 a.m. she got the chloral, her pulse being then 68, soft and compressible; temperature in axilla 99·8; six minutes after taking draught feels sleepy; abdominal pain still continues; pulse and temperature unchanged. At 11:55 a.m. she fell asleep, and slept soundly till 4:40 p.m. Her pulse was then 68. Soon after waking she became very excited; talked incoherently; got sick, and retched a good deal. At 9:40 p.m., as she was again complaining loudly of the extreme abdominal pain and pain in breast, with great tenderness, especially in the supra-pubic region, her pulse 72, temperature 100, pupils normal, tongue clear, but very red, she got a draught with 45 grs. of chloral in 2 oz. of cinnamon water. She objected thoroughly to the acid taste of the medicine. Two minutes after taking it pain in abdomen greatly relieved; twenty minutes afterwards pulse 78, and softer; temperature had fallen 0·5; pupils widely dilated; is very flushed, excited, and talkative. She then soon fell asleep, and slept till 3½ a.m., when she awoke complaining of the pain as before.

February 24th.—She was still complaining of great pain at the morning visit. She was ordered a turpentine draught with acetum opii; and in the evening, as the pain and restlessness continued unabated, I ordered 55 grs. of chloral in a draught. By some mistake she did not take this. I found next morning that she had contrived to smuggle in some whiskey, after taking which she slept as well as after the medicine.

25th.—Her condition was much the same as the previous days, and she was now ordered 65 grs. of chloral in ℥ii. of peppermint water. She got sick immediately after swallowing this; however, she fell asleep half an hour afterwards. At 8 p.m. she was in great pain and begged loudly for an anodyne. I resolved to try the effect of a larger dose of chloral than I had yet administered, as I gradually increased the dose day by day up to the present. I prescribed—

℞.—Hydratis chlorali, grs. lxx.

Syrupi, ℥ii.

Aquæ cinnamoni, ℥i.

℞.—Fiat haust.

Immediately before taking this, appeared in much pain, and manifested extreme tenderness over uterus. Pulse 116; temperature normal. Five minutes after taking the chloral began to talk in an excited and incoherent manner; begged me to cut her open

and see what was wrong with her. Ten minutes after she fell sound asleep. Pulse 112; respiration slightly stertorous. Thirteen minutes after medicine, pulse 100. At ten o'clock I found her fast asleep; respiration perfectly natural; pulse 80. At midnight she awoke, went over to the fire, returned to bed, fell asleep immediately, and remained so till past 6 a.m.

February 27th.—She is complaining just as before; and, in order to try whether the relief she stated she had derived from the chloral was really the effect of the medicine or not, with Dr. Johnston's approval, after the same formalities of taking her pulse, temperature, &c., with which she was familiarized when getting the chloral, a draught of sweetened peppermint water was administered.

This, however, produced no effect whatever; and at three o'clock, when I visited the ward, finding her in a state of great suffering, I resolved to try the effect of repeated small doses of chloral, and accordingly directed:—

R.—Chlorali hydratis, ʒi.

Syrupi, ʒi.

Aquæ menthæ pip., ʒv.

M.—Fiat mistura cujus sumat, ʒi. quæquæ hora.

until the pain ceases or she sleeps. The first dose produced sleep; and each time the pain returned it was repeated with the same result.

CASE XVI.—*Hysterical Peritonitis*.—M. C., aged twenty-five, a patient in No. 11 ward, suffering from hysteria. At 11 a.m., April 20th, was apparently in a good deal of pain, referred to the abdomen. At 11·5 a.m. hydrate of chloral, grs. xxxv., in cinnamon water was given; five minutes after eye-lids drooped, appeared drowsy, and suffering less pain. At 11·30 effects of chloral seemed wearing off, as shown by restlessness and moaning. Pulse 116; temperature 103·8 (at 10·30 pulse 124; temperature 103·1). At 11·45 fell asleep, and continued so until 12·10 p.m.

CASE XVII.—*Rigidity of the Os Uteri during Labour*.—February 28th.—A primipara, aged twenty-two; ward 2; admitted in labour; has been in labour since 10 p.m. on the 26th. On the 27th, at 11 p.m., os size of florin, thick and rigid. On the 28th, at 8·45 p.m., the os being still in the same condition, though in the meantime she had been treated in the ordinary manner, by warm baths, opiates, and solution of tartar-emetic, I resolved to try the effect of chloral, and ordered the following draught, which was given at 8·50 p.m., her pulse being then 100:—

℞.—Hydratis chlorali, grs. xl.

Mel despumat, ʒi.

Aquæ cinnamoni, ʒi.

M.—Fiat haust. statim. sumend.

At 9 p.m.—Asleep; pulse 90. 9·10 p.m.—Asleep; pulse 88. 9·30 p.m.—Asleep; pulse 88. 9·38 p.m.—Roused up for a moment, had a pain, and settled down again. 10 p.m.—Asleep, not very soundly; was examined; no change in condition of os uteri. 10·15 p.m.—Having been restless and in pain for the last quarter of an hour, was ordered a second draught with 20 grs. of chloral; in all, one drachm in one hour and twenty minutes. After taking draught she at once fell asleep again. 11 p.m.—Still sleeping soundly. At 3 a.m. she woke up, and at 4·30 a.m. she was delivered.

CASE XVIII.—*Rigidity of the Os Uteri during Labour.*—March 7th.—A case of rigid os in a primipara, aged twenty-four. Strong labour had gone on for 24 hours; membranes ruptured; os thin and rigid, continuing the size of a shilling. Chloral was given in ten grain doses without any apparent effect for three hours. The warm bath was now resorted to with great benefit; she had four hours sound sleep; the os then relaxed, and delivery was easily effected with the forceps.

CASE XIX.—*Labour Retarded by Rigidity of Os Uteri.*—April 9th.—I was sent for to see a lady, aged thirty, who had been for forty-eight hours in labour. It was her third confinement. On examination I found the os the size of a florin, thin and rigid; pains strong; pulse weak and rapid; patient exhausted by the protracted suffering. I ordered a warm bath, an aperient enema, some beef-tea, and a draught with 20 grs. of chloral at once. In two hours I found the os the same size and the pains much weaker. She now got another stimulating enema of salt and water, and afterwards another warm bath. She was chloroformed at her own request (as she had been another time, during her last labour in Malta), and kept under the influence of the chloroform for three hours. No advance being made I gave her a second draught with 20 grs. of chloral at 8 p.m., and this being rejected I gave a third at 9 p.m. At midnight I found the os nearly the size of a crown, but still rigid and undilatable. She had a third warm bath, which appeared to relax the rigidity more than anything else; and at 6 a.m. the os

was so far dilatable that I was enabled to deliver her with the long forceps.

CASE XX.—*After-pains*.—April 16th.—M. A. L., aged twenty-six, delivered of her third child, after a natural labour, at 7 p.m.; at midnight was complaining loudly of after-pains, and by her outcry kept the other patients in the ward awake. I prescribed 15 grs. of chloral as a draught at once; three minutes after taking this the pains were relieved, but she did not sleep that night. Next evening she again complained of uterine pains, for which 20 grs. of chloral was given; this produced almost immediate sleep.

CASE XXI.—*After-pains*.—April 17th.—T. N., aged twenty-two, second pregnancy, confined in the same ward as the last patient, also complaining of after-pains; had a draught with 20 grs. of chloral at 9 p.m., immediately after taking which the pains ceased and she slept all night.

CASE XXII.—*Acute Ovaritis after Delivery*.—April 17th.—Puerperal patient, two days after delivery complained of great abdominal tenderness, especially in left iliac region; no tympany; no pain except on pressure; lochia natural; pulse 104; tongue moist and clean; not having slept since the 14th, was given two drachms of Long's aromatized chloral, being equivalent to 20 grs. of chloral, at 11:30 p.m. Eight minutes after taking this she was asleep and slept for three hours. Next morning the tenderness returned, and her pulse was 136. She is still under treatment.

CASE XXIII.—*Insomnia*.—February 28th.—A. G., aged twenty-six, suffering from debility after confinement and hemorrhoids. A very nervous excitable woman, unmarried, in a very despondent frame of mind. On the nights of the 25th and 26th slept very poorly; last night did not sleep at all. When she doses is awakened by fearful dreams; manner abrupt and peculiar; appears not far from being insane; tongue dry and covered with white fur; pulse 104; countenance pale and anxious. Complains of great headache and palpitation.

R.—Chlorali hydratis, ʒi.

Tincturæ valerianæ ammoniat., ʒiii.

Infusi valerianæ ad., ʒvi.

M.—ʒi. 2 da. quaque hora.

March 1st.—After taking the second dose of the mixture she went to sleep; passed a good night, and awoke decidedly better. This medicine was then continued for some days with marked benefit.



CASE XXIV.—*Insomnia*.—April 19th.—Patient 125.—Ward 11.—Had not slept for two nights. At 12·5 p.m. two drachms of the syrup of the hydrate of chloral (20 grs.) were administered in water. The patient lively and talkative, was not suffering any pain; pulse 95. Within one minute after swallowing the draught her eyelids drooped, and she said she felt drowsy. At 12·10, *i.e.*, in five minutes, she was sound asleep, breathing quietly and naturally. Awoke as from natural sleep; no headache or other unpleasant symptom.

CASE XXV.—*Insomnia*.—April 19th.—Patient 124.—Ward 11.—A patient suffering from insomnia and cellulitis after delivery; in place of usual anodynes a similar draught to the above was given at midnight. Draught almost at once ejected from stomach. It, however, had time to be, at least, partially taken into the system, for this patient, whose pulse was 120, and who complained of much pain, was asleep in a few minutes, and slept until morning.

CASE XXV.—*Ulceration and Sub-acute Inflammation of the Uterus*.—Mrs. B., aged twenty-eight, married ten years; has three children; the youngest of them is eight years old. For the last four months she has been under my care, suffering from ulceration of the os uteri, sub-acute inflammation of the uterus, and occasional sudden brief successions of intense pain, referred to the region of the left ovary. Before she consulted me she had been under the care of an eminent London physician, and before that had been treated by a military surgeon at Netley. I need not pursue the history of her case further than to say, that under appropriate treatment the ulceration was cured, and the other uterine symptoms subsided. But the neuralgic paroxysms of ovarian pain continued to recur every ten or twelve days, and harassed her for two or three days together. Various plans of treatment were resorted to ineffectually, and she was ultimately directed to take  $\frac{1}{16}$  of a grain of perchloride of mercury in  $\mathfrak{z}$ i. of compound tincture of bark three times a day, and equal parts of the unguentum opii, hydrapyri, and iodi were directed to be rubbed in over the seat of pain. Whilst pursuing this treatment she came to me on February 18th in such a paroxysm of pain that she could not stand straight, being bent like a very old woman, to relieve the pain; her pulse 120, and her countenance expressive of great suffering. I sent for some chloral, and gave her 20 grs.; this

produced almost instantaneous relief; her pulse fell to 90; her face, from being pale and anxious, became rosy and cheerful, and she was enabled to walk home. I repeated this treatment on two subsequent occasions with similar effect.

Besides the foregoing, I have given chloral in twelve other cases; but the space at my disposal does not permit me to give the details of them in the present communication. One was a case of slight *delirium tremens*, a middle-aged gentleman, cured by 10 gr. doses of chloral, repeated every third hour till sleep was obtained. One was a case of insomnia, acute gastritis, and some mental disturbance occurring in a patient ten days before her confinement, and suffering from the abuse of wine and ardent spirits, of which she consumed an almost incredible quantity. In this case, which I saw with my friend Dr. Moore, of Amiens-street, chloral, given in large doses, failed to produce sleep, which followed the substitution of bromide of potassium for the chloral. Two were cases of irritable bladder. Two cases of rigidity of the os uteri during labour, in which chloral appeared of some use. Two were cases of puerperal mania, in one of which 15 gr. doses of chloral produced sleep; in the other 35 gr. doses had no effect; and lastly, four were cases of after-pains, relieved by from 5 to 20 gr. doses of chloral.

In some of the foregoing cases chloral failed to produce sleep; in two or three cases it not only failed to produce sleep, but, on the contrary, induced a condition of extreme nervous excitement and hyperesthesia. But in the great majority of cases the chloral allayed nervous excitement, relieved pain, or produced sleep with great certainty and remarkable rapidity. I have, moreover, observed the fact that the sleep produced by chloral more closely resembles natural sleep than that induced by opium or any other narcotics; the patients were generally free from any unpleasant after-effects, such as those produced by opiates, and informed me that they had slept pleasantly, as well as soundly, and awoke refreshed by their night's repose.

In conclusion, I may venture to say, speaking from my own experience of this substance, that hydrate of chloral is one of the most valuable hypnotics and nervous sedatives at the command of the physician. And I might venture to hazard the opinion that ere very long hydrate of chloral will come to be tried in every case of insomnia, from whatever cause it may arise, and in every case of

acute nervous pain and hyperesthesia, in which opium or other narcotics and sedatives have either failed to produce sleep or allay pain, or are contra-indicated by any cause.

---

ART. XVI.—*Postscript to a Case of "Diffuse Hypertrophy of the Mammæ."* By S. M. MACSWINEY, M.D., Physician to Jervis-street Hospital.

IN the Journal of November, 1869, I related the medical history of a young woman, an hospital patient of mine, who was the subject of great hypertrophy of the mammæ; and for whom my colleague, Mr. Stapleton, under whose care for surgical treatment I had placed her, removed the right breast by excision, after all other means we had recourse to had totally failed to reduce the organ in size. In that communication I mentioned that removal of the breast at the time had become necessary to save the patient's life, and I explained the grounds upon which mainly was based the decision to amputate but one breast, in the first instance at least—the expectation, namely, that this proceeding might be followed by a permanent reduction in the size of the other enlarged gland, as had heretofore happened in several examples of tumors of a like nature (and where but one breast had been excised) recorded in the annals of medicine. I further related in that paper how, after the operation, the remaining organ had greatly diminished in size; and that I even entertained sanguine hopes that it would ultimately assume a normal and permanently quiescent state; but at the same time I fully recognized the possibility of a different result; and in fact, I made the following observations:—"Should this sanguine expectation, however, not be realized, as is quite possible, and should, on the contrary, the left breast—instead of returning to, and remaining of its natural size—resume the process of abnormal growth at present suspended in it, then in this event, I will not hesitate to advise its removal also."

At the time when I sent the report of the case to the Journal, the process of involution of the left mamma was still actively going on. This action, however, shortly after this period, quite suddenly ceased; the size of the organ remained stationary for some weeks, then it began to enlarge again, and soon reached a dimension fully equal to what it had previously attained.

During this time both Mr. Stapleton and I frequently saw this