5. The flow of mucus and saliva may be excessive, and when this is the case the patient is very apt to develop an undue amount of post-operative bronchial irritation.

Continuous practice will, of course, go a long way towards mitigating these troubles. The prior injection of morphine and atropine, especially the latter in tolerably large doses, is also a great help, particularly with regard to the excessive salivation and tendency to bronchial irritation.

Usually, however, the anaesthetist seeks to overcome the difficulties by starting with a little chloroform or "mixture" (equal parts of chloroform and ether, or 1 of chloroform to 2 of ether, or 2 to 3). This is generally administered upon the same mask as prepared for the ether alone—that is, twelve to sixteen layers of gauze with an underlying face-pad, and the patient is carried to the stage of complete anaesthesia, and the pure ether is substituted as soon as it is thought that he will no longer resent the change. In many, perhaps in the majority of instances, this plan succeeds well enough for all practical purposes, but in rather a large number of cases a tendency to respiratory and cardiac failure develops in the course of two or three minutes after the change to pure ether has been made. I believe myself, too, that in some cases deaths have resulted in this way.

To explain these untoward results, it has been suggested that the face-pad and thickish layer of gauze or lint used in the open ether process do not permit of a sufficient dilution of the vapour with air, as is so essential for the safe administration of chloroform, and that when the gauze is wetted, particularly with the heavy, semi-viscid chloroform liquid, an almost impervious or closed system is formed, with momentary accumulations of dense chloroform vapour immediately above the mouth. At any rate, it is quite clear that if chloroform or one of the strong mixtures be used for induction, the face-pad should be discarded, an entirely separate and much thinner mask employed, and the patient must be most carefully watched for the faintest indication of respiratory or other failure. Slight as these changes really are, they suffice to rob the open ether process of its simplicity, and therefore are seldom adopted.

Looking about for a means to overcome these difficulties, my attention was attracted by Dr. McCardie's excellent paper on "A Method of Anaesthetizing Soldiers," which appeared in the BRITISH MEDICAL JOURNAL of April 21st, 1917, in which he advocated the use, in a Clover's inhaler, of a mixture of 1 part of chloroform to 16 of ether. I proposed, therefore, to use this combination of 1 in 16 in lieu of the stronger mixtures alluded to above. Before doing so, however, I took the opportunity when in Birmingham to discuss the subject with Dr. McCardie. He expressed his doubts about my proposal, and said that he thought the same objections would apply to his 1 in 16 mixture as to the stronger ones. However, I gave the combination a trial, and, although it succeeded admirably in many cases, it obviously required careful watching, and in some few instances I received rather adverse reports about it.

I then experimented with various combinations of the two drugs, and have finally settled upon a mixture of the following proportions:

Chloroform	...	...	...	1 drachm
Ether	...	...	...	32 drachms (4 oz.)

This, it will be seen, is approximately 3 per cent. of chloroform in ether, or a very little stronger (3 in 99).

In using this attenuated mixture I have found that the following are the chief points to be attended to. Although not essential, it is of advantage that the patient should have a preliminary injection of morphine ($\frac{1}{2}$ grain to $\frac{1}{4}$ grain) and atropine ($\frac{1}{160}$ grain to $\frac{1}{80}$ grain). The face-pad and mask is the same as for open ether, the mask being closely applied to the face and face-pad from the very beginning. The liquid is used exactly as if it consisted of ether alone, the presence of the small quantity of chloroform being ignored. During induction the liquid is poured freely on to the mask just to the verge of resentment, but when consciousness and reflexes are abolished, it will suffice to reduce the supply to the dropping stage. If at any time during the course of the operation it be thought that the anaesthesia is not sufficiently deep, there need be no hesitation about increasing the amount. Needless to say, the same care in watching and maintaining the breathing are required in this as in any other method

of anaesthetization; the plan makes no pretence to be "absolutely fool-proof."

In my own hands and in the hands of many others who have tried it, the combination used in the way indicated has given excellent results. The advantages that I would claim for it are:

1. *Simplicity*.—There is no need to change the drop bottle or mask, or to remove the face-pad, which are the same as for the original open ether method.

2. *Rapidity*.—As the result of many careful time tests I have found that the patient is well able to be moved in about five minutes, and that the first incision may be made in another minute or so. At the outside, ten minutes should complete the whole process. This is a very great gain as compared with a possible twenty minutes—a gain both to the patient and the temper of the surgeon.

3. *Lack of Irritation*.—It is really quite remarkable how the addition of such a small quantity of chloroform should go so far in the direction of converting the pungent ether into a comparatively bland vapour. The consequence is that the patient has much less objection to the inhalation than when pure ether is used; there is also less respiratory spasm, less lividity; and the struggling is practically limited to the simple movements of the stage of excitement.

4. *Efficiency*.—This, of course, is a point upon which longer experience is desirable, but so far I have never had any difficulty in obtaining a sufficient degree of relaxation to satisfy the requirements of any of the surgeons with whom I have worked, and the depth of anaesthesia can be very readily regulated.

5. *Economy*.—The greatest expenditure of the liquid is naturally during the induction stage, but that seldom exceeds a couple of ounces, and I have estimated that for the maintenance of anaesthesia subsequently from 4 to 6 oz. per hour is ample. This is a very great saving and comfort to all concerned.

6. *Safety*.—Neither this nor any other anaesthetic can claim to be absolutely safe, nor can it be said that care and attention on the part of the administrator are less valuable assets than with any other drug or combination. On the face of it, however, I think that it is obvious that the possibilities of over-dosage with chloroform are much diminished when the half-drachm required for induction is diluted in two ounces of ether, given in ten rather than in two minutes, and that a drachm to a drachm and a half used in the course of an hour is but little likely to do much harm.

The flow of mucus and saliva and the subsequent tendency to respiratory irritation are much diminished, but I do not claim that this is to be wholly placed to the credit of the mixture, but rather to the routine use of full doses of atropine which I have always advised. I should point out, however, that on account of its relative rapidity of action the 3 per cent. mixture will be found useful to those who adopt the open ethyl chloride-ether sequence. In fact, I have myself made a few quite satisfactory experiments in the direction of using liquid ethyl chloride in lieu of chloroform, but I have not followed up this line of work, although I believe that it may be worth while doing so. One of the objects of this communication is to establish the principle of what I would call "attenuated mixtures," and to endeavour to show that "straight" chloroform or strong mixtures are by no means essential as an induction to open ether, but that, on the contrary, they introduce unnecessary risks in the open ether method.

TREATMENT OF ECZEMA BY RECTAL SALINE INJECTIONS.

By PERCY B. SPURGIN, M.R.C.S., L.R.C.P.

THE balneological treatment of certain forms of skin disease is nothing new; the internal administration of drugs as a means of cure is well recognized, and is, in certain cases, useful not only to alleviate symptoms but, in certain conditions, to cure the complaint.

The internal treatment, by means of saline injections into the bowel, is, I believe, something out of the common, and the following history, considerably condensed, of a very severe case of generalized eczema treated by this method, may be of interest to your readers.

C. M., aged 49, enlisted in August, 1915, and went to France shortly afterwards with a labour battalion. After being in France for twenty-five months, during which time he had fair health, he was sent home to England because of swelling of his ankles and feet. He was admitted to a military hospital and remained there for three weeks; he was then transferred to another military hospital, where he was a patient for three months. His knees were still swollen when he was discharged to a labour centre and recommended for a discharge centre.

Two days before his discharge was due he was taken ill and admitted to the hospital of which I was in charge on February 5th, 1918. He was a tall, spare man, in poor condition; the temperature was 97° F. There was confluent eczema on forearms and hands, which was beginning to discharge, and some patches on front of chest, face, and neck. Three days later the ears and neck were covered with crusts, from under which pus was oozing; fomentations did not relieve the condition. On February 12th his condition was getting worse; the temperature was 99.8°; he was having daily bran baths. On February 16th the temperature had risen to 100.4°; he was now covered with eczema, the trunk, arms, thighs and neck, also the face in part, being crusted over; from beneath the crusts was exuding thick offensive pus. Up to this time the patient had been taking his food pretty well. Three days later he was feeling worse and taking food badly, although sleeping well. The temperature was 101° F.

He grew very weak and emaciated and the temperature kept up until March 2nd, when it dropped to 97.6°. On this day he felt very cold, but was otherwise comfortable. Large patches were becoming detached, and pus was still oozing from beneath the crusts; the stench was very bad. He was taking food fairly and sleeping pretty well. He developed some catarrhal bronchitis a few days later, but this cleared up after a week on ordinary expectorant treatment. The crusts were still coming away in large pieces, leaving a raw purulent surface.

On March 24th the hands and wrists were very swollen; the temperature was 100°; the eczema extended all over his trunk, back and front, and on every limb. Two days later the knees were very swollen, and the temperature rose to 101.2° on the following day. By April 6th he was worse, with severe pains in his left arm and both knees. He was treated with colchicum mixture; he was too weak to continue the baths. The suppuration had lessened considerably. The next day he was very low and wandering in his speech, but he improved on stimulants and aspirin and slept a little. By April 22nd he was very ill indeed; the respirations were irregular and shallow, almost Cheyne-Stokes in character. He rallied again after stimulation, and for the next few days there was nothing to note specially, although he was getting steadily weaker, and was like a living skeleton. His joints were still swollen, and he was in considerable pain; taking very little nourishment, and having but little sleep, in spite of hypnotics. On June 13th he was very collapsed and in an extremely critical condition, and the pulse was rapid and weak, and the motions blood-stained. June 15th saw him with a very bad colour, pulse weak and thready, and unable to take his food. He had not slept. Morphine induced a good sleep, though of short duration, but he took food better during the night, and was fairly comfortable. On June 17th the pulse was hardly perceptible. A simple soap enema, followed by a rectal saline containing *sp. vini gallici* 1 oz., was given and retained. Next day there was a slight improvement; he was sleeping and taking food better. Two days later there was a noticeable improvement, the patient was eating better and sleeping well. Saline and brandy were given every other day, after clearing the bowel with soap enema. By June 23rd he had markedly improved, was much stronger, and was bright and cheerful. The eczematous condition was rapidly clearing away, the swelling of the joints was lessening, although he still complained of considerable pain. Appetite was good and sleep sound. The leg pains were severe next day, but twenty-four hours later were much less and his general condition better. During the next fourteen days, excepting a slight rise of temperature on June 29th, accompanied by sharp pains in the limbs (the weather was very wet), he made steady progress. He was much stronger, eating and sleeping well, and was bright and cheerful. His skin was much improved, clean and healthy. He continued to gain in strength and weight. The salines had been continued every other day. On August 14th the patient got up for the first time for over four months. By this time the skin was practically clear, and the appetite, sleep, and general state entirely satisfactory. By the beginning of September he had remarkably improved, he was getting up on alternate days, the odd days being given for the salines and rest in bed.

Progress during the month was well maintained, the patient had been out in a bath chair several times, and by the end of the month he was able to stand and to walk a few yards, with support. From this time onwards convalescence was steady and uneventful; he was stronger every day and fattening visibly. The knee-joints were still much enlarged, but there was no pain. After a time he was discharged the service, owing to chronic gouty arthritis.

Some years ago it was noticed, during an epidemic of infantile diarrhoea in Paris, that certain infants suffering from eczematous conditions of the skin, while under the saline treatment for their diarrhoea, were much improved as regards their skin troubles. Remembering this, I was induced to try the effect of salines on my patient; the result shows very markedly the effect of saline on the metabolism. The patient was apparently past all help when this form of treatment was commenced, and the really extraordinary change which took place in a few days was deeply interesting and gratifying.

To the nursing staff who carried out my suggestions so carefully, to the R.A.M.C. orderly who never spared himself in time or trouble, I owe my best thanks, and to Colonel Kay my thanks are due for permission to publish this case.

AN UNUSUAL CASE OF HAEMORRHAGE FROM TONSILLECTOMY.

BY

H. LAWSON WHALE, M.D., F.R.C.S.,

LARYNGOLOGIST TO THE HAMPSHIRE GENERAL HOSPITAL, AND TO THE LONDON TEMPERANCE HOSPITAL.

The following case presented the complication of obstinate haemorrhage to a degree which is, fortunately, unusual.

A girl, aged 13 years, was on April 9th, 1919, anaesthetized (CE₂), with the head extended over a sandbag, for the enucleation of submerged tonsils by dissection.

The left tonsil shelled out easily, quickly, and nearly bloodlessly. On the right side, as soon as the upper half of the tonsil had been separated from its bed, copious bleeding began. This welled up from the extreme depths of the fossa, from a point entirely concealed by the anterior pillar, and from about half-way up the fossa. In colour the blood was arterial; an inability to detect pulsation may have been due to the depth of the bleeding point. This was probably either the tonsillar branch of the facial artery, or a tributary of the pharyngeal venous plexus.

Artery forceps failed to control the bleeding. Wagner's clips failed to grip the posterior faucial pillar; perhaps this was due to spasm of the palato-pharyngeus, for the patient was by now only lightly anaesthetized, and with the pharynx constantly and rapidly refilling with blood it was both difficult and dangerous to keep her under. With a cleft-palate needle three sutures were passed through anterior and posterior pillars, and these were sewn together over a strip of ribbon gauze; this also failed to stop the bleeding, and with repeated spasm one stitch cut out. A Cullum's clamp was now tightly applied, with temporary success. In order that the patient might tolerate the clamp she was, after removal to bed, kept lightly under morphine.

Nine hours later CE₂ was again given and the Cullum's clamp gingerly removed. Bleeding was, if anything, more profuse than before. Swabs and artery forceps were again tried fruitlessly. Cullum's clamp was reapplied while the external carotid was tied at its origin; the clamp was then removed.

The possibility of an abnormal tonsillar blood supply was suspected for the following reasons:

1. The common carotid had a high bifurcation—slightly above the hyoid level—and no superior thyroid branch could be seen. It seemed, therefore, likely that other arterial abnormalities might coexist.

2. Occlusion of the external carotid checked the bleeding almost entirely, but, for the moment, not absolutely. For these reasons the possible existence of a tonsillar branch from the internal carotid was surmised; and, as a safeguard, a second ligature was left loose around the common carotid, to be tightened if necessary. The slight residual oozing, however, stopped entirely in a few minutes; and this loop around the common carotid was removed in twelve hours. The after-history is as follows:

The blood lost was not measured, but the patient retained 1½ pints of saline in the rectum and 2 pints more subcutaneously. No serum was given nor calcium salts. But as a precaution against delayed poisoning after two anaesthetics with a chloroform mixture, the patient was given sugar dissolved in milk. The mouth was constantly cleansed by alkaline swabs and the post-nasal space by a nasal douche. The right tonsil (of which the removal had never been completed) sloughed out piecemeal, doubtless as the result of cutting off its blood supply; and two weeks later both tonsillar fossae were clean and empty. There was found to be no albuminuria, nor any blood dyscrasia which could aggravate bleeding. Thus a count of haemoglobin, colour index, and white cells, and a differential count of the latter by Dr. Sanginetti, revealed only a simple secondary anaemia, which was the only obvious disability of the patient when she was sent to a convalescent home on the twenty-eighth day.

Commentary.

Branches of the descending palatine arteries, or other bleeding points in or near the faucial pillars, are relatively easy to identify and pick up with artery forceps. Bleeding from invisible points deeper in the fossa (the tonsillar branch of the facial, a branch from the dorsalis linguae artery, or a tributary of the pharyngeal venous plexus) of ordinary degree is usually stopped permanently by clips or ligaturing the faucial pillars. Cullum's clamps (or any other pattern which acts similarly) are easier to apply, and usually effective; but the control obtained is not always lasting. In this case, after the clamp had been on for nine hours, the bleeding recommenced still more freely on its removal. The fear of fatal sloughing contra-indicates leaving the clamp on for too long.

In the reporter's experience either stitches or Wagner's clips have succeeded invariably, except in this case, in