all the surfaces affected were soaked in iodoform emulsion. In neither the abdominal nor hip cases was any drain tube employed, so that there could be no question of the carrying off gradually and continuously of the disease products subsequently to the operation. In both instances the same procedure seems to have put an end to the local disease.

Of course all these cases are being watched carefully at short intervals for a possible return of the local or general affection; but though many months have elapsed since some of them were operated on, there is no evidence up to date of local mischief except in one, and the general condition continues steadily to improve.

A METHOD OF ADMINISTERING ETHERISED NITROUS OXIDE AS A GENERAL ANÆSTHETIC IN MINOR SURGERY.

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In selecting an anæsthetic for use in minor surgery the following points should be attended to, namely:

1. It should be as nearly as possible "safe."
2. Little or no previous preparation of the patient should be required.
3. The anæsthesia induced should be perfect.
4. The after-effects should be practically *nil*.

Of known anæsthetics, nitrous oxide is the one that fulfils more of these requirements than any other, and one is strongly tempted to direct one's attention to the possibility of utilising it in some form or another in all cases.

Fig. 1.—Apparatus arranged for direct administration. A, gas bottles; n, conducting pipe, a section of which is represented above; c, reservoir bag; d, face-piece.

I would remind you in the first place that nitrous oxide anæsthesia in its purest and most unobjectionable form is not, as some would have us believe, merely a matter of asphyxia; and, on the other hand, that the specific anæsthetic properties of the gas are such that its administration absolutely undiluted with air has hitherto been considered essential for the production of satisfactory narcosis. Now it is obvious that this exclusion of air,

although it may intensify the specific action, can only be continued for very short periods, for periods so short in fact that the full specific anæsthetic effects have barely time to develop before phenomena due simply and solely to arrested tissue metamorphosis or oxygen starvation make their appearance. In other words, the period of primary narcosis, or that due to a single continuous application of the facepiece without the admission of air, is short, and hence the objection to the use of gas alone in minor surgery. In order to overcome this difficulty you will see at once that two courses are open to us. We may either administer the gas mixed with air or some other oxidising agent, or we may increase the specific anæsthetic power of the gas, so that a deeper narcosis may ensue before the development of symptoms of oxygen starvation. The first of these alternatives hardly as yet comes within the range of practical anæsthetics, but the second has been in vogue for some time, and it is to a method of doing this that I venture to draw attention.

The production of full ethereal anæsthesia I do not propose to describe, the ether in the following method is used simply as an adjunct to the nitrous oxide, which is the main anæsthetising agent.

The accompanying figure (Fig. 1) represents the apparatus which I usually employ myself for the administration of nitrous oxide alone. Full details of the working of this apparatus, and of the phenomena of nitrous oxide anæsthesia, are contained in my little manual on the subject, and I do not, therefore, propose to discuss the matter at any length here. I may, however, point out that the main features of the apparatus in question are: a pair of steel bottles (A) containing the liquefied gas, which on escaping through the conducting tube B expands fully in the reservoir bag C, and is inhaled through the facepiece D; between C and D is a three-way stopcock, by working which we are enabled either to shut off the gas from the facepiece entirely, or to admit the gas during inspiration only, or to allow of free in-and-out respirations into the bag. The question now is, How is it possible to adapt this apparatus and method so as to permit of the admixture of small quantities of ether vapour with the gas inhaled? Many plans have been suggested, and many forms of apparatus have been contrived; the one to which I would now draw attention recommended itself to my notice mainly on account of its simplicity and lightness, and having used it a good many times I can say confidently that for the purpose for which it is intended it is quite effectual.

Fig. 2.—Miniature ether chamber in position for the administration of etherised nitrous oxid.

Fig. 2 represents the apparatus in position. Those who are familiar with the portable ether apparatus devised by the late Mr. Clover will at once recognise the principle of the chamber I am describing. It consists simply of a metal reservoir, surrounded in half its extent with a water jacket; the air or gas inhaled becomes charged with ether vapour by passing through a central tube and over the liquid ether. It differs from Mr. Clover's apparatus in the following particulars:

1. It is much smaller, holding only half an ounce of ether.
2. The central tube passes right through the chamber, so that the latter can rotate freely and independently of either bag or face-piece.

If we wish to administer etherised gas to a patient with this apparatus the central tube is removed, half an ounce of ether is

poured into the reservoir through *b* (which opens and shuts by a simple reversing movement), the central tube is reinserted, the index turned to *c*, and the whole fitted as in the figure. In cold weather the chamber should be dipped for a few seconds in hot water, and dried before being charged. Before applying the facepiece all odour of ether should be got rid of, and this can readily be done either by turning on the stopcock and forcing a little gas through the tube and facepiece, or, better, by the administrator applying the facepiece to his own face, and taking one or two deep inspirations of air.

It is an important advantage claimed for the use of etherised gas that it is almost immaterial in which position the patient is placed—upright, supine, or semi-recumbent, at the convenience of the operator. The mouth should, by preference, be propped open as for tooth extraction, but it is not essential. The administration is commenced precisely as though gas alone were being used; the ether chamber is, for the time being, ignored, and, as it is completely cut off, the odour of ether should not be perceptible to the patient. After the first five or six inspirations the ether chamber is turned sharply so that the index points to 1, two or three more respirations are permitted, and another movement to 2 is made, and so on, until all the gas inhaled passes over the ether before reaching the facepiece, that is, the index points to *F*.

If the phenomena of profound nitrous oxide anæsthesia have not by this time developed, the valves in the threeway tube may be cut off and a few respirations in and out of the bag, across the ether, may be allowed, until the subsultus, stertor, or jactitations and spasm warn us to desist. The reservoir bag should of course be kept full the whole time in order to counteract leakage, and to avoid the subjective sensation of suffocation which is sometimes complained of if the supply of gas is scanty.

Now as to the phenomena due to the use of etherised gas. In the main these are or should be simply those of gas alone, but of course in children, in bronchitic adults, and in elderly people, the first few inspirations of gas may not succeed, as they usually do, in benumbing the sensitive mucous membranes of the larynx, trachea, etc., and a certain amount of cough and laryngeal spasm may follow the first admission of ether; but this usually subsides quickly, and if not severe may be neglected.

The pulse is often, as we should expect, slightly accelerated with the influx of ether vapour, and secondarily to this acceleration the lividity is usually very marked, but as it is probably due less to asphyxia than to retardation of the blood-oxidising processes, it need not cause alarm. The conjunctivæ become as a rule markedly injected, but the dilatation of the pupil is even less constantly an indication of profound anæsthesia than is the case with nitrous oxide alone. Nor should we rely too much upon the abolition of conjunctival reflex as an indication for the commencement of the operation; it is one of the peculiarities of nitrous oxide anæsthesia that the eye reflexes are often abolished quite early, so that it is better to wait for the commencement of some other phenomena, such as twitching of the eyelids or of the extensor tendons, stertor, etc., the inhalation being continued during the performance of the operation. If the mouth is the scene of operation, the narcosis must of course be profound, in order that advantage may be taken to the fullest extent of the primary anæsthesia, but the point beyond which it is inadvisable to proceed varies vastly with each individual case.

Next as to after-effects; these, of course, vary with the amount of ether inhaled. In favourable cases no more after-disturbance is to be anticipated than with gas alone. The patient is a little longer coming round, and, may be, is somewhat staggering in gait and excitable in manner for some one or two minutes, but at the end of that time is usually quite able, as far as the anæsthetic is concerned, to get about his ordinary work. With a little more ether, and slight prolongation of the narcosis, lassitude and depression is complained of for the rest of the day. Others again may be actually sick, or suffer from headache, but these latter phenomena are, or should be, if the anæsthetic is administered with judgment, quite the exception, and we should aim at prolonging the nitrous oxide anæsthesia alone, rather than at the development of ether narcosis.

If the operation takes longer than was at first anticipated, the anæsthesia may be prolonged by removing the facepiece with every three or four respirations for the admission of a small quantity of air, the ether supply being kept full on all the time; this I believe to be a better plan than the use of more or less complicated taps for the admission of air to the apparatus itself, and not

the less so because it entails rather more vigilance on the part of the anæsthetist.

Next, as to the duration of the primary anæsthesia which it is possible to induce by this means, that is, the anæsthesia which ensues after a single application of the facepiece before the admission of any air. I find that, as a rule, it is very difficult to convey to the mind of an operating surgeon by mere figures the actual extent of the operation which it is possible to perform in a comparatively brief period. If one could induce surgeons to forget for the moment that the available anæsthesia with nitrous oxide alone is, approximately, thirty seconds, and to remember only that that brief period suffices for the extraction of two, three, or sometimes even more teeth, I feel sure that the use of this very satisfactory anæsthetic in general surgery would be greatly extended.

In the same way with etherised gas, the period of available primary anæsthesia induced by the method I have attempted to explain I have found to average 47.6 seconds (eighteen observations, longest time 77 seconds, shortest 33 seconds), but I have records of the removal of no less than ten teeth while under its influence, and of the performance of many minor operations, such as opening abscesses, scraping glands, tonsillotomy, for Meibomian cysts, sounding for stone, etc., and many other small operations of about the same duration will occur readily to most so that I hardly need to enumerate them.

ENGLISH AND FOREIGN WINTER RESORTS.

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THE relative merits of our English winter resorts and those of the South of France and North of Italy cannot, I think, be settled in the summary manner adopted by Dr. Burney Yeo, in the JOURNAL of December 21st. If, indeed, we must accept his four propositions that the advantages of such resorts depend on (1) the amount of sunshine, (2) the warmer temperature dependent on it, and (3) the smallest number of rainy days and the greater absence of atmospheric humidity, there is no room left for criticism. But are sunshine and a very dry atmosphere the only, or, indeed the chief, requirements of the majority of invalids in the winter months? Where these conditions exist in the greatest perfection there must necessarily be a wide variation of day and night temperature from the sun's rays on the one hand, and the free radiation on the other—rapid changes which it is difficult to meet by clothing, and which can only be fully overcome by free bodily exercise.

In estimating climates we allow ourselves to be hampered by the ubiquitous bugbear phthisis, which, if the prevailing views of its pathology are correct, is a disease for hygienic rather than for climatic treatment. The subject is also too much influenced by the bodily sensations of healthy persons whose muscular system is ready to meet the wide variations of temperature, and whose minds are free to entertain the charm of new scenery and physical surroundings. If we omit phthisis, what are the diseases which require a better winter climate than London or the inland districts of our islands? Chronic rheumatisms and strumous disease of children, which disable the body for active exercises; functional nervous diseases and overwork, which require an even and soothing climate, and not an exciting dry one like that of the South of France, where fairly healthy persons sleep with difficulty; liver, dysenteric, and gastric diseases, which require a narrow range of temperature, and are not benefited by a high one; and chronic pulmonary diseases (not phthisical), which also require a narrow range of temperature and which are not always benefited by a very dry temperature.

With regard to judging climates by meteorological observations, it is very misleading to trust to mean results. The same mean temperature may be derived from a very wide range and from a narrow range, and the minimum (which is the temperature which damages or kills the invalid) may be higher with a low mean than with a high one. The minima are not given in Dr. Yeo's tables, but it is quite possible that the higher mean temperature of San Remo is due to the higher maxima for an hour or two in the middle of the day (which are of little value to the invalid) than to a higher absolute temperature of the twenty-four hours. When the range is wide the mean temperature may not occur for more than a couple of hours in the twenty-four, while with a narrow