(not vasodilators as the authors of this article suggest). Indeed one of the most certain ways of precipitating gangrene in the chilled limb is to bring about vasodilatation by heat or other means. A summary of the experimental work which led to these conclusions nearly thirty years ago will be found in chapter 23 of the third edition of *The Foot* (Lake) or in *The Surgery of Modern Warfare* (Bailey).

Incidentally the article on dry cold therapy by Bigelow and Lanyon in the same issue (p. 215) raises some points of a similar nature. At long last the virtue of keeping parts temporarily deprived of their blood supply (whether this be due to blocking of the larger arteries or local ischaemia due to the pressure of exudates) in cold storage is becoming recognized, and the specific indications for refrigeration are being worked out.

To quote from the chapter on frost-bite in *The Foot:* "The main indication for the therapeutic use of the method (refrigeration) is in those cases where a collateral circulation may be confidently expected to develop within a reasonable time if the limb in the meanwhile can be prevented from undergoing gangrene. The results are less notable in the more chronic cases—i.e., thrombo-angiitis, etc.—but even in the senile cases the relief of pain will often enable one to postpone the inevitable amputation to the most propitious moment.

"We may sum up the position, therefore, by stating that a cold (i.e., in the region of 0° C.) limb requires no blood supply, since all its tissues are in a state of suspended animation, and as a corollary, a limb depleted of its blood supply should be kept cold, otherwise its tissues canot retain their vitality."—I am, etc.,

NORMAN C. LAKE.

Recognition of Anaesthetic Gases

SIR,—The Council of the Medical Defence Union is at present actively engaged with the Association of Anaesthetists in a review of certain difficulties experienced by anaesthetists with respect to the recognition of the actual gas or gases delivered to and from anaesthetic apparatus. It is hoped in the near future that it will prove practicable to submit to your readers a full report on the measures proposed by the above bodies for adoption by those concerned to obviate errors of wrongful coupling or of misidentification of the gas or gases in use.

For the present all anaesthetists of whatever experience and qualification are urged to satisfy themselves personally of the actual gas about to be administered to a patient and not to rely upon the assurances of other parties. The factor of personal responsibility should never be absent from the mind of an anaesthetist, with the result that before commencing the administration of any gas or mixture of gases he should check his apparatus and cylinders completely to satisfy himself beyond reasonable doubt on the character of the gaseous anaesthetic he proposes to administer to a patient.—I am, etc.,

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Intravenous Anaesthesia

SIR,—Mr. J. F. O'Connor (Feb. 5, p. 199) has raised several points in connexion with our article on intravenous anaesthesia (Dec. 25, p. 813) which we would like to answer.

1. *Use of Table.*—In practice we stand our saline container on the table of the Boyle's apparatus (the very stable hospital pattern) from which we administer the supplementary nitrous oxide and oxygen. If the site of operation necessitates the use of a leg vein for the intravenous drip, a separate table will not be in the surgeon's way. The anaesthetist as well as the surgeon must have the right of access to some part of the patient.

2. *Use of Hand Bulb.*—We agree that this requires more frequent attention than the method of choice—i.e., using the oxygen cylinder to provide positive pressure—nevertheless, if the hand bulb is used, a screw clip or pair of ovum forceps applied to the tube when the pressure has been raised in the bottle will prevent any leak, and the hand bulb need only be used at long intervals when the drip is seen to slow up. So long as any pressure remains in the bottle, saline must flow into the vein, and there is no question of blood running back into the needle and clotting. A gravity drip-stand must be tall to provide the necessary pressure and will be, therefore, either top-heavy or have a wide base to get in the surgeon's way.

3. *Fixing Needle.*—The three pieces of strapping as described in our article have always proved adequate. The extra strapping suggested by Mr. O'Connor would give greater security.

4. *Pressure Tubing.*—We agree, any *good* rubber tubing will suffice. Under wartime conditions this is in short supply, and we mentioned pressure tubing to prevent the leakage of saline from the puncture sites.

5. *Premedication.*—We normally use as a maximum omnopon 1/3 gr. and scopolamine 1/150 gr. given 1¼ to 1½ hours before operation; this time allows its maximum hypnotic effect to be attained and its most marked respiratory depression to have passed. We believe that the large doses of morphine up to 1/2 gr. as suggested by Mr. O'Connor have too marked an effect on respiration, especially when the anaesthetic drug to be employed is itself a depressant.

6. *Vomiting.*—The use of analeptics to hasten recovery is known to increase the incidence of post-operative vomiting. We agree with Mr. O'Connor that this sequel is often attributable to the morphine and would be a further reason for limiting the pre-operative dose of this drug and restricting its indiscriminate use post-operatively. We have noticed that in many cases there is a long period between return to consciousness and the onset of vomiting, and this can often only be explained as a result of post-operative opiates.

7. *Dosage.*—We would like to state categorically that there is no such thing as a maximum and minimum "dose" of pentothal, any more than there is a "dose" of chloroform or ether. The amount given must be regulated by the susceptibility or resistance of the individual patient, the length and depth of anaesthesia required by the surgeon, and this can only be determined as the operation proceeds. Excessive quantities of pentothal or any other anaesthetic agent will delay recovery, and to our minds this prolongation of respiratory and circulatory depression is a potent factor in the aetiology of post-operative complications. As was stressed in our paper, it is considered most important that for any but the shortest operations intravenous anaesthesia should be supplemented by nitrous oxide and oxygen. For operations not requiring much relaxation—e.g., skin grafting, suture of multiple lacerations, simple herniotomy, etc.—an induction dose of 1/4 to 1/2 g. of pentothal supplemented with nitrous oxide and oxygen will maintain anaesthesia for 1/2 to 3/4 of an hour. For longer operations or those requiring greater relaxation the same method is used, but small repeat doses of pentothal, 0.05 to 0.15 g., are given as required. Even for the longest operation requiring the deepest anaesthesia we have rarely if ever had to use more than 2 g.—i.e., 40 c.cm. of 5% pentothal. We consider it wiser to obtain such profound and prolonged relaxation by a combination of a regional nerve block or spinal analgesia and a light general anaesthetic (such as nitrous oxide and oxygen following a pentothal induction). For the majority of such cases as hysterectomy, prostatectomy, and appendicectomy, etc., 1 g. (20 c.cm.) of pentothal plus nitrous oxide and oxygen has been found to be quite sufficient.

In conclusion we should like to thank Mr. O'Connor for the interesting points he has raised in his letter and to sympathize with him in his double responsibility of operating while supervising the anaesthetic. We feel that this difficulty is closely allied to the whole problem of undergraduate and postgraduate teaching of anaesthetics, the solution of which is not assisted by the unavoidable production during wartime of many *semi*-specialist anaesthetists.—We are, etc.,

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Treatment of Chronic Nephritis by Serum Transfusion

SIR,—I find Dr. J. H. Hannan's letter on this subject (Feb. 12, p. 232) confusing. He states that serum transfusion in shock and haemorrhage has been well established; inferentially its use should follow in the treatment of "chronic nephritis or nephrosis." "Nephrosis" is the term he prefers to use in cases of chronic nephritis with presumably oedema. Where is the connexion?

In shock and haemorrhage serum may be used to increase the circulating blood volume; in the nephrotic syndrome there is no significant reduction in the C.B.V. Protein solutions are used here to maintain the blood reservoir, and, especially when given in "hypertonic" concentrations, to promote oedema resorbtion and diuresis; moreover, serum may be dangerous in the treatment of haemorrhage by acting as a blood diluent.

I deplore the use of the term "nephrosis" for cases of chronic nephritis with proteinuria and oedema, and do not agree that in these cases we restrict the protein intake, nor do I see why "protein obtained from and at the expense of the body cells" increases oedema. The "nephrotic syndrome"