

## OUR PRIZE COMPETITION.

DESCRIBE METHODS YOU HAVE SEEN EMPLOYED IN GIVING SERUM INJECTIONS, ALSO DESCRIBE FULLY THE AFTER EFFECTS WHICH MAY FOLLOW SUCH INJECTIONS.

We have pleasure in awarding the prize this month to Mrs. G. Firth Scott, Codfield, Wilts.

### PRIZE PAPER.

*Anti-toxic sera* may be administered prophylactically or therapeutically. As an example of the former the routine inoculation of soldiers with anti-tetanic serum may be cited, and of the latter the administration of diphtheria anti-toxin to a diphtheria patient.

(1) The sub-cutaneous method is useful when a small quantity of serum only is required and when there is no urgent hurry for the absorption of the serum. It is usual to give prophylactic doses of anti-tetanic serum in this manner.

(2) The Intra-muscular injections are given when it is needful to use more serum (*e.g.*, above 10 cc. of it); when it is urgent that the anti-toxin shall be quickly absorbed, as in the case of anti-diphtheritic serum, because the drug will be more rapidly absorbed from the deeper tissues.

(3) The Intra-venous method is only used when large doses of anti-toxin have to be "rushed up" to meet the invasion of a severe dose of toxin. Sometimes as much as 100 cc. of anti-tetanus toxin is administered to a patient suffering from tetanus, but it is the most dangerous method of any and is only used in emergencies.

(4) The Intra-theal method consists of a puncture directly into the spinal cavity—usually an equivalent amount of cerebro-spinal fluid is withdrawn before the corresponding amount of serum is introduced. It is preferable, but by no means general, to give the patient a general anæsthetic when using this method. The anti-meningococcic serum is always given intra-theally, usually about 30 cc. of serum.

The above are the four methods employed, the sera for which they are appropriate are anti-tetanic, anti-dysenteric, anti-diphtheritic, anti-meningococcic, anti-tubercular (Carl Spengler's I.K., and Dr. Friedmann's turtle serum amongst others). These sera react on specific toxins circulating in the patient's system, *but* they do not affect the actual bacteria. For instance diphtheria bacillus will live and thrive in a tube of diphtheria anti-toxin.

*Anti-microbic sera* are those which attack the invading organisms themselves but which do not affect the *toxins* already formed by uninjured microbes. Anti-cholera serum will kill cholera vibrios, anti-streptococcic serum, streptococci, anti-pneumococcic serum, pneumococcus and so on, they are all strictly specific and their action is limited of course by the amount of micro-organisms present.

The dangers attending the administration of sera are: (1) causing an abscess, (2) breaking a needle, (3) anaphylactic shock. Ordinary aseptic precautions will prevent the first complication which arises from an unsterile syringe, site of puncture, or serum. The latter ought never to be opened until the doctor is about to use it if in ampoules, and if in a bottle it must be kept sealed with a tight-fitting rubber cap, the top of which should be wiped with pure lysol and a sterile swab. The skin must be sterilised as if for an operation by washing, painting with iodine, and in the case of intra-

venous injections by subsequent washing away of the iodine with ether. After the injection a piece of sterile gauze sealed with collodion should be applied. A needle should never be pushed in against a bone, used when blunt or bent, or when the patient is struggling if it can be avoided.

Anaphylaxis is a condition about which there is still much to learn—it is serious, sometimes fatal in its effects, and there seems no way of knowing *for certain* when a patient may develop the symptoms. Apparently there are certain individuals who instead of becoming less sensitive to injections of anti-toxins become more sensitised and react violently even to small doses. Intra-venous injections of large amounts of serum are most likely to bring on the condition, but it may occur after a small sub-cutaneous dose. Normal serum (*i.e.*, one not charged with any specific anti-bodies) is quite as likely to bring on anaphylaxis as any other.

The general theory is that the condition only occurs if an interval of twelve or more days elapses between the injections of the same serum. If small doses are constantly given with only a few days' interval there is not much danger of anaphylaxis, and if horse serum is used one time and the next time rabbit serum, even though more than twelve days have elapsed there will be no symptoms. Other proteins such as egg white will produce identical effects as serum if injected subcutaneously. The administration of a general anæsthetic prevents anaphylaxis probably by inhibiting the nerve cells and rendering them insensitive to the reaction.

There is so far no certain method of desensitising a patient who has had a previous injection of serum, but the administration of minute doses (5 cc. serum in 50 cc. normal saline, and 1 cc. to 25 cc. of this solution to be administered with intervals of a few minutes) has been found to minimise the risk. The symptoms are \* "nausea and vomiting, small and rapid pulse, faintness or more serious heart failure, dyspnoea with rapid and shallow respiration and feeling of suffocation, collapse, rigors, convulsions, and even coma."

Immediately after the injection a rash like "nettle-rash" may come out, also fever, and pains in all the joints—the more serious symptoms set in generally within six hours of the second injection of serum. These symptoms are compatible with acute irritation of the vagus nerve and sympathetic system. Therefore drugs such as atropine sulphate 1-50 gr., or adrenalin solution, may be given intravenously, and these should be kept ready with a syringe when serum injections are being administered. Otherwise the patient is treated for shock, given brandy and hot bottles, and fresh air—sometimes ether is given as an anæsthetic. Stramonium cigarettes are useful in relieving the asthmatic spasms which occur. Above all only give serum *re-injections* very slowly and watchfully.

### HONOURABLE MENTION.

The following competitors receive honourable mention: Miss Hilda Gertrude Moore, Mrs. M. E. E. Farthing, S.R.N., Miss P. Thomson.

### QUESTION FOR NEXT MONTH.

What methods may be employed for securing free action of the skin? In what conditions might they be advisable? State how you would carry them out.

\* R. T. Hewlett's "Manual of Bacteriology."

[previous page](#)

[next page](#)