NOTE ON THE BACTERIOLOGICAL QUALITIES OF ROOF-COLLECTED SAMPLES OF RAIN WATER.

By SIR ALEXANDER HOUSTON, K.B.E., M.B., D.Sc.

As a result of a conference of delegates of municipal authorities and others, held in connexion with the Smoke Abatement Exhibition in 1912, a committee was formed for the investigation of atmospheric pollution. The committee's first report was published in 1916, and together with the succeeding reports are full of valuable information bearing directly, or indirectly, on the quality of rain water.

The writer, in his recent book on *Rural Water Supplies and their Purification*,* dealt fairly exhaustively with rain water as a source of water supply.

From a health point of view, rain water has the advantage that it is practically free from the possibility of human excremental pollution. That is, of course, excluding those cases where the rain water is stored in pervious underground tanks, unfavourably situated as regards drains, cesspools, and other sources of dangerous contamination. On the other hand, roof-collected rain water may be contaminated by the "droppings" of birds, the excreta of rats, mice, and other lower animals, and a multitude of flies, insects, etc.

Speaking generally, there is nothing in the chemical composition of rain water to preclude its use for drinking purposes apart from its physical qualities and taste.

As regards taste, even pure rain water is apt to have a flat, insipid taste, and impure samples are so objectionable as almost to create feelings of nausea.

The physical appearances of rain water are often most uninviting. It is frequently highly coloured, and contains much suspended matter.

The writer in the aforementioned book dealt rather fully with the physical and chemical qualities of rain water and the means to be adopted to bring about its purification. He now seeks to supplement this information with a brief account of the results of some bacteriological investigations.

In common with many others, the writer sought during the war to economize in every way in the use of water and so reduce the consumption of coal.

One obvious way of attaining this object was to collect the rain water and use it for garden watering purposes instead of relying solely on the Metropolitan Water Supply.

Accordingly, a small tank (21 in. by 17 in. by 16 in.) was connected with one of the rainfall pipes leading from the gutters so as to collect a proportion of the rain falling on the total roof space.

The writer's house is situated just within the four mile radius, and it occurred to him to test the bacteriological quality of the water, as representing town rain water, from time to time, the samples being usually collected during, or just after, heavy rainfall.

As there is no "rain water separator," as no precautions were taken to clean out the gutters, and as birds (sparrows, thrushes, blackbirds, etc.) are numerous in the neighbourhood owing to the close proximity of a large open area of about four acres of grass bordered by trees, there seemed some reason to suppose that the conditions were, at all events, not conducive to extreme purity.

The bacteriological results were remarkably and uniformly good. The number of bacteria (agar at 37° C.) was very small (1.8 per c.cm.), and in bile-salt agar no microbes grew, even when 10 c.cm. were used for cultural purposes. No typical *B. coli* were present in 100 c.cm. of any of the nineteen samples collected between July 11th, 1918, and April 29th, 1919.

The writer is far from suggesting that these results are typical of roof-collected rain water, but they do seem to show that rain collected in this way need not necessarily be impure as judged by the ordinary bacteriological tests. The investigations are still in progress, and the writer would be glad to receive and examine in his spare time a reasonable number of samples, collected from other sources, sent by any of his readers who are interested in the subject. Sterile bottles should, of course, be used

* *Rural Water Supplies and their Purification*. Messrs. John Bale, Sons and Danielsson, Ltd. 1918.

for this purpose, holding at least 150 c.cm., and the samples should preferably be sent "iced."

In the reviews on his book (*Rural Water Supplies and their Purification*) the writer noted that some of the "reviewers" were rather led to conclude that the author advocated individual as opposed to concerted effort in purifying water. This, of course, is far from being the case, the writer being a strong supporter of publicly controlled water supplies. The book was written with the avowed object of trying to help those who had the misfortune to be so situated that no public source of water supply was available. Under these conditions the only wise thing to do is to make the best use of existing circumstances. It is true that in these cases it is much more common to utilize well, spring, or brook water for domestic purposes, but where these sources of water supply are liable to be polluted, or otherwise objectionable, the use of rain water is not unsound on hygienic grounds. The best means of rendering rain water palatable are described in detail in the writer's book.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

DISAPPOINTMENTS AFTER GASTRO- ENTEROSTOMY.

THE following case occurring in my practice is of some interest in view of the recent correspondence on this subject:

L. R., a young girl, was operated on in 1914 for gastric ulcer, the operation being gastro-jejunostomy. Pain and vomiting returned after an interval of a few weeks, in consequence of which a second operation was undertaken in 1915 by another surgeon; this consisted of an entero-anastomosis of duodenum and jejunum. The vomiting again returned after another short interval, and has persisted ever since.

In August, 1918, the abdominal scar, which until then had been quite healthy, appeared to give way in the middle line, and gradually formed a wound the size of a shilling, and from which blood-stained fluid escaped. The wound was packed daily with cyanide gauze, 2 ft. of 1 in. gauze being easily inserted. That the wound communicated with the intestine was proved by the fact that a piece of packing gauze 2 ft. in length escaped into the wound and was passed per rectum, and also that partly digested food passed from the wound soon after the patient had taken it.

The fistula has now apparently closed, and the patient is again suffering from the same acute pain and vomiting after even liquid food.

The vomiting in this case was at first attributed to reflex conditions, but it now seems to be proved to be due to physical obstruction following the gastro-jejunostomy.

I believe the condition to be sufficiently rare to justify publication.

Bedworth.

LIONEL E. ORTON.

EFFICIENT TREATMENT OF CHRONIC RUNNING EAR.

IN my opinion the comments of Dr. William Wilson in the *JOURNAL* of May 24th, p. 642, are open to severe criticism.

Dr. Wilson says he has based his experience on three and a half years as an aural surgeon in the army. I venture to suggest that that experience is not sufficient to form an opinion of real value in this important branch of surgery, on the following grounds:

(a) Many of the cases, I take it, he quotes are caused by rupture of the membrana tympani by shell fire or by other cause, and infection caused by sand or other dirt.

(b) It is not to be expected that many of his cases were tuberculous.

I should like to take Dr. Wilson's comments as by his own paragraphs.

1. This has been to my knowledge the usual practice for many years past.

2. This has also been the orthodox practice except that the treatment in some cases may be in the out-patient room.

3. This certainly has been the practice of most aural surgeons in recently infected cases, and I take it that most of Dr. Wilson's cases were so.

4. Again this has been the usual hospital practice for years past.