(3) Inoculations must continue to be voluntary.
(4) The *personnel* of medical units, especially, should be inoculated.
(5) At present it is not advisable to recommend inoculation of members of a family where enteric has broken out, and where one can practise isolation of the patient and disinfection of all discharges, &c.
(6) Workers in scientific laboratories and civil hospitals are a class, especially, who should be inoculated.

The last section of the series of articles gives an account of the various new methods of preparing the vaccines, along with a comparison of these methods, in which the report of the German committee of investigation is quoted. The author states that Wright's method is the most easy of application for preparation of vaccines in large quantities, and that it also appears to give the best results. But he finally advocates Besredka's method of combining the vaccines with antityphoid serum as being the most rapid and effective method of conferring immunity, in that it immunises in twenty-four hours, provokes no local or general reaction, does not set up any other action (*i.e.*, a negative phase), and maintains immunity for a longer period than any other method.

W. G. M.

Correspondence.

GUN DEAFNESS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—I do not propose to discuss the causes or the frequency of gun deafness, but to enquire from correspondents what are considered the best practical means of prevention in peace and war, and whether they can be enforced. At Shoeburyness, where there is much heavy gun practice and experimental gunnery work, decided deafness is not common and perforation of the membrana tympani is rare. It is, I think, the opinion of most instructors that constant gun practice impairs their hearing.

The precautions usually recommended, and usually adopted at gun practice here, are (1) to keep the mouth slightly open, and stand facing the same way as the gun, and, if possible, not in front of the line of the breech; (2) to keep a loose wad of wool or an ear protector in each meatus.

A loose wad of wool or waste is as much used as anything, and, though not very cleanly, is generally available. Some men say their ears "catch cold" when the wool is taken out, and others that a little wool sometimes lodges and irritates the ear, and has to be syringed out. Wool is said not to afford sufficient protection in the Navy during heavy gun practice on board ship.

Mallock's ear protector is rather difficult to retain and to keep clean;

Elliott's, being perforated, permits the ordinary tones of the voice to be heard, it can be cleaned, and is the best apparatus that I have seen.

I am, &c.,

Shoeburyness,
March 11th, 1907.

H. J. FLETCHER,
Lieutenant-Colonel, R.A.M.C.

RESPIRATION AND DISEASE.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—The perusal of Major Fowler's most interesting article on "Auto-Intoxication and Liver Inadequacy," which appeared in last month's issue of our Journal, has led me to write these few lines on a subject of no less importance. The absurd manner in which the majority of soldiers carry out their respiratory functions is, I am sure, an important agent in the production of many of their ailments.

It is clear that if the respiratory act is performed in a faulty manner, not only is respiratory exchange imperfectly carried out, but the abnormal air pressure to which the pulmonary cells are thereby subjected finally brings about their destruction. In normal respiration the thorax is expanded and contracted solely by the action of the muscles situated below the level of the clavicles. This mechanism ensures the adequate potency of the airway and the noiseless flow of air to and from the lungs, and under the circumstances the intrapulmonary air pressure is never less than that of the surrounding atmosphere, and never greater than that found in the correct production of speech and song. Critical observation will reveal the fact that these conditions, of such vital importance to the health of the pulmonary cells, are not present in the ordinary recruit, for, during even the most moderate form of exercise, during conversation, or when trying to take a deep breath, he sucks in the air by raising the shoulders and contracting the muscles of the neck, in other words, a more or less extraordinary effort, suggesting respiratory failure, has been made. The inevitable "sniff" or "gasp" which accompanies this act, plainly shows that the airway has been narrowed; the consequence of this is, of course, to temporarily lower the air pressure in the respiratory tract and produce a transient flushing of the vessels. Each expiration is also noticeable as an audible act, due to the partial closure of the glottis reflexly, brought about by the strain placed upon the muscles of the neck in holding up the thorax; this, combined with the fact that the upper chest sinks in at a greater rate than the lower, owing to the inability of the cervical and other muscles to nicely regulate expiration, brings about a harmful increase of intrapulmonary pressure. That these two factors sooner or later impair the vitality of the lung tissues is certain, and the onset of pulmonary and other affections becomes merely a question of time.

It can be readily understood when this harmful type of respiration remains uncorrected, loss of mobility in the comparatively little used