The conclusions of the reviewer are:

1. On the Russian side the total mean casualties for the infantry regiments vary between 10 to 40 per cent. (or about 20 per cent. as average) for all battles; for artillery and cavalry about 10 per cent. The proportion of killed to wounded (excluding missing) is from 1 to 4 up to 1 to 7.

2. The proportion of wounded by rifle fire is about 83 per cent., as compared with 14 per cent. by artillery fire, and 3 per cent. by side-arms.

3. Three-quarters of the wounded were able to walk.

4. Forty-five per cent. could return to the ranks after three weeks.

5. By adopting measures of hygiene suitable to the climate, and providing for feeding the men by means of wheeled kitchens, the number of Russian sick was less than in time of peace.

6. By means of the first field dressing with each soldier immediate surgical operations have been vastly reduced.

7. The practice of evacuating completely (à outrance), as practised by the Russians in the Manchurian battlefields, so far from increasing the number of deaths amongst the wounded, had, on the contrary, a happy influence on the results of wounds.

W. G. M.

Correspondence.

DR. M. S. PEMBREY AND DIAPHRAGMATIC DRILL.

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

DEAR SIR,—I judge from Dr. Pembrey's attack on my paper that he is under the impression that diaphragmatic drill is a new system of breathing. As it is nothing of the kind, and thinking that some of our other readers may fall into the same error, I hasten to assure them that the exercises are only intended for those who need some assistance in correcting a vitiated type of respiration. The drill is neither more nor less than the movements which take place in normal breathing, and obviously those who breathe correctly have no use for it.

We are told that "breathing is strictly the intake of oxygen and the output of carbon dioxide." Is this so? As Keith poetically expresses it, "every organ in the body swings with the respiratory tide," that is, provided the diaphragm is brought into active use. Without a more or less full and free movement of this muscle, the apices of the lungs cannot be efficiently ventilated, nor can the adequate activity of the liver and other abdominal organs be maintained. The heart also looks to the respiratory movements for assistance in carrying out its functions. (Johannes Müller has shown that quiet nasal breathing, i.e., diaphragmatic, furthers not only the return of venous blood to the right heart, but also the pulmonary circulation. Whereas, in quiet oral breathing,
owing to the freedom with which air enters the lungs, there is scarcely any negative pressure, and consequently the circulation receives very little assistance.) Lastly, there is the phenomenon of voice which is largely dependent upon the air blast. Breathing, as a matter of fact, has very far-reaching effects, and faulty, lazy, or careless breathing makes for lowered vitality.

Speech and song, both natural attributes of man, are muscular exercises which result in the production of carbon dioxide. And carbon dioxide, so Dr. Pembrey tells us, regulates the depth and frequency of the ventilation of the lungs; yet a speaker or singer learns to regulate the breathing so as not to interfere with his singing or speaking by an ill-timed inspiration. Asthmatic patients also offer us a proof of the fact that movements which are usually involuntary can be held in check and regulated, for they learn to resist the impulse which urges every oppressed man to quicken the respiratory movements, and better their condition by slowing the rhythm of respiration, and prolong it as much as possible. Again, persons who have been emphysematous for years know how to breathe to better advantage than they did at the commencement of the disease. By slowing their breathing they render it more efficient. Expert runners, boxers, cyclists, &c., also learn to control their breathing, whilst the novice, as a rule, soon gets out of breath, owing to too precipitate and shallow movements of the thorax; experienced runners learn to control their bellows, and many do so according to methodically enunciated principles; for example, Arthur Duffey, the American sprinter, runs the hundred yards in two breaths—the first he takes at the start and the other about twenty-five yards from the tape—so it is very evident that, whatever the condition may have been at birth, the depth and frequency of the ventilation of the lungs is not altogether regulated by the carbon dioxide in the blood. As a rule, oral breathing, which is more often than not chiefly intercostal in character, makes for shallow, jerky movements. Whereas nasal respiration, i.e., diaphragmatic breathing, makes for deep rhythmical movements. And which of these two systems of breathing becomes habitual rests almost entirely in the hands of the individual himself.

Experience has shown that to follow our instincts, as Dr. Pembrey advises us to, is not always a very wise proceeding. And the slap-dash-go-as-you-please method of physical education, advocated by him, has not always produced the best results, at any rate under modern civilised conditions. There is a method or "form" in walking, running, and even in breathing, and "second wind" is an excellent example of "form" in breathing. The irregular, more or less shallow movements of the chest which were before a prominent feature, are now replaced by regular, deeper and slower chest movements.
Up-to-date trainers for athletic sports leave nothing to chance. Most of them are observant and wonderfully quick at putting two and two together. They are aware of the fact that inspiration and expiration are within reasonable limits controllable acts, and that shallow, irregular movements of the chest are the precursors of breathlessness. So they very rightly argue that the advent of breathlessness will be considerably delayed by making the breathing deeper, fuller and more rhythmical, and the energies of their pupils are directed towards the attainment of this end. Duffey the sprinter, W. G. George (the holder of the mile and other long distance records) Fitzsimmons the boxer, G. A. Olley, the long distance champion cyclist of England, and a host of others, recommend the practice of deep breathing (lower chest) quite apart from sports themselves. And unlike Dr. Pembrey, who tells us "to resist fatigue by experiencing fatigue," they train to resist fatigue, but in the training stop short of fatigue. Teachers of voice production also consider it essential for their pupils to learn how to breathe correctly before proceeding further in voice culture. And many enlightened physicians look upon the promotion of correct respiratory habits as an essential part of treatment in convalescence after illness, &c. So it is difficult to understand how Dr. Pembrey can state that "there is no evidence to show that breathing exercises are of the slightest value."

With regard to Dr. Pembrey's request for the results of experiments showing that soldiers after a course of diaphragmatic drill can run better, and are improved in general health, I can confidently vouch for the latter, but as regards the former I can only conclude that the benefit from systematic respiratory training amongst soldiers would be as great as it is among civilians who train for walking, running, &c., in a rational manner. As I have already stated, men who breathe correctly do not require instruction in respiration. The uncivilised Zulus and Soudanese that are held up to me as examples of individuals who never received methodical training in breathing, belong to this fortunate class. The majority of them are, I take it, fine specimens of humanity because they are excellent breathers. Certainly the Zulus I saw during the South African War carried out their respiratory duties in a more satisfactory manner than the average civilised being, for without exception they were good lower chest breathers. Their simple mode of life, freedom from tight clothing, and an erect bearing, are without doubt factors that have prevented them from becoming, like the majority of British soldiers, "Respiratory Degenerates."

I am, &c.,

Chatham,
June 10th, 1907.

R. F. E. Austin,
Major, R.A.M.C.