

Clinical and other Notes.

OBSERVATIONS ON PIGNET'S FACTOR.¹

BY CAPTAIN J. A. BALCK.

PIGNET'S factor may be briefly described as an index of physical efficiency. It is arrived at by the following formula:—

$$F = H - (C + W).$$

In this F represents the factor, H a man's height in centimetres, C his chest measurement at maximum expiration, also in centimetres, and W his weight in kilogrammes. The larger the excess of H over C + W, or in other words the larger the factor, the poorer the man's physique. In rare cases C + W may be larger than H and then F becomes negative. This only occurs in exceptionally powerful men.

About a year ago Colonel Melville wrote to me suggesting investigations as to the result of physical training on the factor F. I was unable to take it up at the time, but in February, 1911, I began collecting results for this purpose, and have carried them on uninterruptedly since. Captain J. A. Turnbull very kindly collaborated with me by carrying on simultaneous observations at the Depot at Ayr.

Pignet when determining his formula added to it a scale for classifying men according to the size of their factor. This classification was as follows:—

Factor less than 10	..	..	..	Very strong.
10—15	..	..	..	Strong.
15—20	..	..	..	Good.
20—25	..	..	..	Medium.
25—30	..	..	..	Weak.
30—35	..	..	..	Very weak.
Over 35	..	..	..	Useless for military purposes.

My first endeavour was to classify the men under these headings when they came under my charge at the gymnasium at the Curragh. Comparatively few of them came to me immediately after enlistment, most had two or three months' service, and a large number had been in the Special Reserve. The factors of 344 men were as follows:—

Less than 10 (very strong) per cent	10—15 (strong) per cent	15—20 (good) per cent	20—25 (medium) per cent	25—30 (weak) per cent	30—35 (very weak) per cent	Over 35 (useless) per cent
1·4	3·7	6·6	19·4	25·6	23·9	19·4

It will be seen that no less than 69 per cent of these men belong to the weak classes, and that just under $\frac{1}{5}$ of the whole are according to

¹ Received for publication December 20, 1911.

Pignet militarily useless. It must be remembered that these men are not absolutely raw recruits.¹

My next figures represent the factors of the same 344 men at the completion of their course of physical training, and are at least two, if not more months, later than the earlier ones. There is considerable improvement:—

Less than 10 (very strong) per cent	10—15 (strong) per cent	15—20 (good) per cent	20—25 (medium) per cent	25—30 (weak) per cent	30—35 (very weak) per cent	Over 35 (useless) per cent
1.7 ..	2.6 ..	13.3 ..	23.9 ..	22.0 ..	26.1 ..	10.4

There is, it will be noticed, a marked shifting of numbers to the left, *i.e.*, to the stronger classes. Withal there are still 58.5 per cent of the men in the weaker classes, and 10 per cent among the “useless.”

Inevitably, with a scale so obviously out of harmony with our recruits, the next step is to consider whether it is the scale itself which is at fault, or the material from which we draw our Army. An application of the scale to another Army will throw some light on this, and through the kindness of Colonel Melville and Major Pollock I am able to give some recent German figures. For 859 men² passed fit this year at the Musterung (preliminary examination of recruits), in the Gumbinnen District of East Prussia, the apportionment is:—

Less than 10 per cent	10—20 per cent	21—30 per cent	31—35 per cent	Over 35 per cent
47 = 5.4 ..	333 = 39.3 ..	446 = 51.9 ..	26 = 3 ..	2 = 0.23

9,986 men reached the military age this year in the Grand Duchy of Baden,³ 201 were put back as being under height (below 154 cm.). The remaining 9,779 were distributed among the various classes as follows:—

Under 10 per cent	11—20 per cent	21—30 per cent	31—35 per cent	Over 35 per cent
4.7 ..	28.0 ..	45.6 ..	13.6 ..	8.1

For Bavarians³ passed fit for service with the colours the figures are:—

Under 10 per cent	11—20 per cent	21—30 per cent	31—35 per cent	Over 35 per cent
7.85 ..	40.5 ..	49.5 ..	1.77 ..	0.29

It is impossible to resist the conclusion that the scale which was originally devised in the French Army very fairly meets the case, as also in the German Army. We are driven to the admission that its inapplicability to our own service is due to the stamp of recruit we are getting. It should

¹ The figures Captain Turnbull gives for 41 raw recruits are: 10—15 = 9.7 per cent; 20—25 = 7.3 per cent; 25—30 = 17 per cent; 30—35 = 22 per cent; over 35 = 44 per cent; or a total of 83 per cent belonging to the weak classes.

² Seyffarth, “Beitrag zur Verwertbarkeit des Pignetschen Verfahrens,” *Deutsche Militärärztliche Zeitschrift*, November, 1911.

³ *Der Militärarzt*, November 22, 1911.

be remembered, however, in our favour, that the average age of our recruits is only 18 as compared with the continental 20. This age is also, as is only too well known to all of us, in many cases only a nominal 18. I remember a case of a boy who after three months' service admitted he was only 15. A fairer comparison would be one of the Continental recruits with the British soldier of two years' service, as he is found in India or the Colonies. It would be interesting to see the result of measurements taken there.

Are we then to conclude that Pignet's scale is of no use to the British medical officer? By no means; I myself employ it constantly as an index of physical efficiency and would recommend it to all who are in charge of gymnasia. For practical purposes I have lowered the standard by 5 points, making 40 my limit of the useful soldier. With this modification it is an invaluable aid in gauging a man's progress, and arriving at a decision as to his fitness to be dismissed gymnasium.

NOTES ON THE VENTILATION OF TROOPSHIPS IN THE TROPICS.

By MAJOR C. F. WANHILL.

Royal Army Medical Corps.

THE following remarks are based on experience gained on the "Rewa," and are not intended in a captious spirit, or to indicate that the ventilation of that ship is not good, but to suggest improvements which might be embodied when a fresh ship is hired.

Taking first the troop decks, these are ventilated by forced draught in the following ways: (a) By wind scoops in the ports when they can be opened. (b) By wind sails. (c) By blowers, worked by electric fans. There is also a system of extraction of air by fans in the engine room.

This system works well in as far as the actual ventilation of the decks is concerned, if ventilation in the tropics is considered to consist in the removal of the products of respiration and of evaporation from the skin only, but in my opinion this is not all that is required in the tropics. To ensure comfort it is also necessary to have currents of air which, impinging on the body maintain it at a comfortable temperature. In the vast spaces of the troop decks this is almost impossible, as the force of the wind is lost or is not apparent at a short distance from the source. It is also not necessary since most of the troops prefer to sleep on deck.

In the hospital and in the cabins, however, this system breaks down, since with the ports closed, as they have to be occasionally, there is no source of draught. The extraction of the air from each cabin certainly keeps the air from becoming foul, but the process is very gradual and no