V.C. stands pre-eminent. Amongst the other four we find that the populations calculated for decorations awarded to non-commissioned ranks are to those calculated for decorations awarded to officers as approximately 5 to 1.

In the values of c/b we have a measure of the amount of increase in the probability of attainment as the individual passes from grade to grade. Thus if the likelihood of winning the decoration be unity, the likelihood of obtaining a first bar is $1+c/b$, and of obtaining a second $1+2c/b$. The value of c/b is positive if the likelihood increases with the grade, and negative if it decreases. The actual values may clearly be the resultant of both positive and negative influences. For the V.C. and the M.M. these values are frankly negative, that for the M.C. is nearly zero, and those for the D.S.O. and D.C.M. are frankly positive. This would suggest that the decorations fall into two classes which are earned under different conditions. Take, for example, the effect of risk. The value $-0{\cdot}5$ for the V.C. would be accounted for if it could be shown that 50 per cent. of those who earned it died or were incapacitated in the winning. Thus the negative values of the first class of decoration can be accounted for by assuming a high degree of risk in the winning of them. Again, let us consider the questions of leadership and administrative ability. In these a positive value might indicate that although it was difficult for a soldier to get his opportunity in the first instance, once he had made his mark his opportunities for further distinguished service would be increased. The positive values found in the second class of decoration might thus be accounted for. Whether this explanation be the true one or not, it would appear that once the British soldier has got his foot on the ladder he makes good.

In the third column are tabulated values of $b\int f(t)dt$, calculated from $\log(N/v_0)$. If we assume that the ebb and flow of the conflict operate uniformly on the chance of winning each of these decorations, or that they do so within the respective classes, then the tabulated values may be taken as relative values of b, *i.e.* of the chance that an individual, potentially capable of winning the decoration, obtained it in the first instance. In this case also the factor is compounded of the chance that opportunity offers and the chance that recognition is received. Here again the V.C. stands pre-eminent. The low value for the D.C.M. is in agreement with what has been suggested in the preceding paragraph, viz. that it is relatively difficult for non-commissioned ranks to obtain a footing on the ladder. The high values for the M.C. and the M.M. would indicate that in this war of the trenches the opportunities for brave deeds were all too frequent. Taking the decorations separately, the results of this analysis are as follows:—

(1) The V.C. stands pre-eminent amongst the decorations, equally as regards the high standard which is required, the high degree of risk with which the winning is accompanied, and the difficulty of attainment even in the case of the individual who is admittedly of the required standard.

(2) The D.S.O. is an officers' decoration awarded both for deeds of valour, probably of a skilled kind, and for distinguished service of other sorts. The chance of opportunity offering and recognition being received may, in the first instance, be low, but, once obtained, there follows increasing opportunity.

(3) The M.C. is an officers' decoration in which probably the influences of both classes are combined, viz. risk and increasing opportunity. Opportunities of earning it were all too many.

(4) The D.C.M., for non-commissioned ranks, is of the same type as the D.S.O., though the chance of opportunity offering and recognition being received in the first instance is relatively less.

(5) The M.M., for non-commissioned ranks, belongs to the class of the V.C. It is characterised by the risk which the winning entails, and by the indication that the opportunities for the performance of brave deeds were many.

These, then, are the inferences which appear to me to emerge from the hypotheses which I have adopted. There may be others of which I am ignorant, but, such as they are, I venture to offer them as a tribute to the vast potentialities of the British Army, both for valour and for service—potentialities which even at the end of the great war remained to a large extent unexplored; and also as a tribute to the consistency and fairness which characterised the manner in which these decorations were awarded.

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Pasteur Institute of India, Kasauli,
January 1.

Sugar-beet Seed.

AT a recent meeting of the Sigma Xi Society of the University of Colorado Dr. W. W. Robbins, botanist to the Great Western Sugar Co., read a paper on beet-seed production. Dr. Robbins related that so early as 1909 Mr. Hans Mendelson, a German in the employ of the company, undertook to grow beet-seed in Montana. In those days all the seed was imported annually from Europe, principally from Germany, Austria-Hungary, and Russia. It was held by experts that the climate and other conditions would not permit the growing of the seed in America on a commercial scale. Mr. Mendelson thought otherwise, and stated that the time might come when it would be impossible to get European seed. So he continued his experiments on a small scale; and when the war came, and the supply of seed was actually cut off, he had developed his methods to such an extent that it was possible to save the industry. In 1916 the United States was able to produce 5,211,000 lb. of seed, and in 1917, 5,546,000 lb. Furthermore, experimental work had already determined the fact that American-grown seed gave a larger tonnage and a greater amount of sugar per acre than imported seed. From this time the policy of raising American seed will be continued.

I hope that Dr. Robbins will later on tell the whole story of the sugar-beet in relation to the war. The various events are part of the significant history of human progress. But just now it is worth while to note the value to the country of such men as Mr. Mendelson, and the importance of giving them a chance to test their ideas. The public is too apt to think that scientific progress comes only through great discoveries, or requires a Darwin, a Newton, or a Kelvin. It is difficult to exaggerate our debt to the great men of science, but it remains true that the current work of the world does not rest so much on sensational discoveries as on the multitudinous minor facts determined by a host of patient workers. Even Darwin could not have done his work without the aid of such. We shall never get on a proper basis until the scientific worker—no genius, but a normal man (or woman) doing his day's work—is established as a member of the community on a par with the tailor, the baker, or the policeman.

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An Electronic Theory of Isomerism.

THE application of the Bohr theory to organic chemistry suggests a possible explanation of the hitherto unexplained isomerism of certain organic