This conclusion is based upon observations extending over upwards of forty years, and has been rather forced upon the attention of Sir John Lawes, than assumed in the first instance.

The central position of Hertfordshire (at least with regard to England), and the medium character of the soil and climate, afford some reason for expecting an average yield; and the various treatments to which the selected plots have been subjected also assist to secure an average and representative result. The selected plots are five in number, each of which has been similarly treated for the last forty-five years, and all of them have carried wheat every year during this long period. One of these plots has remained continuously unmanured and has yielded on an average 13 bushels per acre, which, strange to say, is one bushel above the official average crop of the United States of America. One has been continuously manured with fourteen tons of farm-yard manure per acre, and has yielded an average of 33½ bushels during the last thirty-six years. The remaining three selected plots have been treated with artificial manures upon a uniform and undeviating plan, and have yielded on an average respectively 32½, 36½, and 36½ bushels per acre taken also over a period of thirty-six years.

The mean average of all these five plots taken over this long period is 27½ bushels, and it is this mean which corresponds with, or at least closely approximates to, the average yield of the United Kingdom. The average yield of these five selected plots for the present year is 27½ bushels per acre, equal to 26½ bushels when calculated as of 61 pounds each. The average yield arrived at on the same principle last year was 28½ bushels per acre, showing a deficit this year as compared with last of 1½ bushel per acre. Again, comparing the result obtained from the Rothamsted standard plots with what is considered the usual standard average of 28 bushels per acre, the deficiency for the present year would appear to amount to 1½ bushel per acre only.

Sir John Lawes's general deduction that the selected plots at Rothamsted fairly represent in yield the average of the United Kingdom is certainly an assumption which might be objected to on scientific grounds. It is, however, as already pointed out, rather to be regarded as an ascertained fact than as a simple assumption, and from the evidence of a large number of years, the fluctuations of yield at Rothamsted may be regarded as a barometer, if we may so express it, of the parallel fluctuations throughout the United Kingdom.

Judged by the standard of the Rothamsted yields, the wheat crop of 1888 is only slightly below the received average of 28 bushels per acre.

It is well known to agriculturists that the harvest of 1879 was the worst which the present generation has witnessed, and during the dismal summer which has now ended, many persons expressed an opinion that the harvest of 1888 was likely to equal in badness that of 1879. This discouraging view has, however, happily been dispelled, and the harvest of 1888, although inferior in both quantity and quality to an average one, is not to be reckoned as disastrous.

One important feature of the harvest of 1888 is, however, its irregularity, and this has not only given rise to many conflicting opinions, but made it exceedingly difficult to arrive at the truth.

The opinion of Sir John Lawes is that upon farms where the condition of the land was defective, as well as upon all lands where there was an excess of artificial nitrogenous manure, there was less than the average produce; but that when the manurial conditions were more favourable there was more than an average produce. Thus the continuously unmanured plot yields only 10 bushels per acre instead of 13, the average of the preceding 36 years. The farmyard manure plot, on the other hand, yields 38 bushels, against an average of only 33½ bushels. Lastly, the plot which receives an excessive amount of nitrogenous manures in the form of ammonia salts, as well as mineral substances, yields only 35½ bushels, against its average of 36½ bushels. The result thus generally indicated is supported by experiments made beyond the list of the usually selected plots, and is in these experiments still more pronounced.

The economic conclusion arrived at by Sir John Lawes after carefully passing this evidence in review is that "Taking the average population of the United Kingdom for the harvest year 1888-89 at rather over 37¼ millions, the estimated requirements for consumption, at 5.56 bushels per head, would be about 26½ million quarters. The area under wheat is reported to have been 2,663,436 acres, or nearly 300,000 acres more than last year. This area, at 26½ bushels per acre, would yield nearly 9

million quarters (8,947,480), and deducting 2 bushels per acre for seed, there would remain rather over 8½ million quarters (8,281,621) available for consumption, and there would therefore be required about 18½ million quarters (18,394,271) to be provided from stocks and import. It is admitted that the wheat crop not only of America, but of some other countries whence we derive supplies, will be below the average. But during the last two months of the past harvest year our imports were at the rate of 21 million quarters per annum, and there seems no reason to fear that there will be any difficulty in obtaining sufficient supplies."

ON THE INFLUENCE OF LIGHT UPON THE EXPLOSION OF NITROGEN IODIDE.¹

THE statement of L. Gattermann in his recent paper (*Berichte d. deutsch. chem. Gesellsch.* xxi. 751; following up V. Meyer's paper in the same volume, p. 26) on nitrogen chloride, that its explosive decomposition may be brought about, or its susceptibility to explosion much increased, by exposure to bright light, has recalled to my mind the fact, which did not specially impress me at the time, that I myself undoubtedly observed the same relation several years ago in the case of nitrogen iodide.

In a paper on the preparation and composition of the latter substance, published in the first number of this *Journal* (April 1879), it was noted that on two occasions the product obtained with the composition NI_3 or N_2I_6 "exploded in some quantity under water with much violence and complete shattering of the vessel."

I remember distinctly that in one of these cases I had just carried to a window, through which the sun was shining, the beaker full of water at the bottom of which was the black sediment of iodide, and was gently stirring the liquid with a glass rod, holding the beaker up so as to look at it from below, when the rod touched the lower part of the side or the bottom of the vessel, and the explosion occurred.

In the other case the iodide was being washed with ice-cold water of ammonia, the vessel standing on a table exposed at the time to the direct rays of the sun. I do not remember with certainty what seemed to precipitate the explosion on this occasion, but I believe it was the pouring some fresh liquid, from the height of a few inches, on the black sediment of iodide which had just been partially drained by decantation.

Under ordinary circumstances nitrogen iodide, while wet, exhibits no extraordinary sensitiveness, and may be safely worked with, only becoming highly dangerous on drying, so that I have little doubt that bright sunshine was influential in bringing about these two explosions.

J. W. MALLET.

University of Virginia, May 8, 1888.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. Hill, now Master of Downing College, having resigned the Demonstratorship of Anatomy, a senior demonstrator and two junior demonstrators at £100 and £50 stipends, and a University lecturer on advanced human anatomy are to be appointed, providing four teachers for the aggregate stipend, £250, formerly received by the Demonstrator. Starvation pay this, considering the limited opportunities in Cambridge for supplementing the income of an anatomist.

A grant of £80 from the Worts Fund is recommended to be made to Mr. M. C. Potter, to enable him to make botanical researches and to collect specimens in Ceylon during the coming winter.

The old Chemical Laboratory being now vacant, it is to be altered into a Pathological Laboratory for Prof. Roy.

The new scheme of examinations in natural science was passed last week; the chief features being the appointment of two examiners each in elementary biology and chemistry, to take the 1st M.B., and the "specials" for the ordinary B.A. The stipends are rearranged, and in addition to a fixed amount a proportionate sum per candidate is allotted to the examiners, 5s. for Tripos candidates, 4s. for 2nd M.B. physiology and anatomy, and 2s. for the rest. Thus the examiners in anatomy and physiology, if 100 candidates

¹ Reprinted from the *American Chemical Journal*, vol. x. No. 4.