

directly, but indirectly and from the air, by the abundant cultivation which Mr. Smith's method enabled him to give. Mr. Way was of opinion, then, that, so far as the organic elements of vegetation were concerned, there was no absolute impossibility, but, on the other hand, every probability, that they might be secured in all abundance for large crops without manure, provided that the soil was fully exposed to the influence of the air. The only question that remained was in regard to the exhaustion of mineral matters by this mode of cropping. Mr. Way believed that the danger of mineral exhaustion in soils was frequently very greatly overrated. There was no doubt that the continuous cropping by wheat, or any other plant, without the return of anything in the shape of manure, would gradually but certainly reduce the quantity of mineral matter contained in the soil; but the quantities so removed were now accurately known, and it would be found that a continuous course of cropping by wheat for many years took from the land only a very insignificant quantity of these substances. The following table showed the amount of phosphoric acid, potash, &c., removed by a large crop of wheat in one and twenty years respectively, and in another column of the table would be found the *per centage* composition which the soil must have to yield them for twenty such crops.

35 BUSHEL OF WHEAT AND 2 TONS OF STRAW.

	lbs.	lbs.	Per-centage removed from soil by 20 crops.
Silica ...	171	3,420	0.152
Phosp. acid	30	600	0.027
Sulph. acid	8	160	0.007
Lime.....	16	320	0.014
Magnesia	10	200	0.009
Potash....	39	780	0.036
Soda.....	3	60	0.003
	277	5,540	0.248

The per-centage removed from soil by 20 crops, is calculated on the assumption that the soil is 10 inches deep and weighs 1,000 tons.

Those who had had anything to do with the analysis of soils would see that no soil of ordinary fertility would be found without a small quantity of those minerals here mentioned—indeed, it is usually the case that a loamy soil would contain from two-tenths and upwards of potash, and other things in proportion; and although the whole of this might not be available at any one time, the constant stirring of the land bringing into play the action, furnished a constant supply adequate to the wants of the plants. But although there might be no danger of exhausting the land by this system of cultivation, Mr. Way did not see what good reason there was for continuing it on the same land for more than a certain number of years—say seven or ten—and then alternating with other land which had been meanwhile under manure. In conclusion, he begged to say that, having shown as far as he was able the

admissibility of the improved Tullian system on theoretical considerations, his duty was over: it was for practical men themselves to test thoroughly the merits of the plan, and to decide upon its ultimate adoption or rejection.

On the motion of Mr. Gadesden, seconded by Mr. Wolryche Whitmore, the best thanks of the Council were voted to Prof. Way, for the favour of this second lecture on a subject of so much interest and importance.

Captain Wentworth Buller, R. N., had visited the Rev. Mr. Smith's farm at Lois-Weedon; and he went to it as sceptical as a man could go. He was told that wheat had been grown for six years successively on the same land, and was informed of the application of labour to the several operations of the crop. He resolved, if possible, to pick holes in the system. He examined the thrasher and the labourers on the farm; he looked over the crops; but he was unable to detect any error in the statements made to him. Mr. Smith showed him his wheat, and the fields on which his average crops of 36 bushels an acre had been raised: his men corroborated his assertions. He ascertained the price of digging, and found that people could earn 2s. a-day. All the manure was applied to the green crops, which were as marvellous as the corn-crops. He had first a heavy crop of rye cut in April, then sweeds, and afterwards trenching. There was not too much or too little moisture. The roots extended to 18 inches. The crop being never checked, the straw, as in Mr. Hewitt Davis's system, was bright, from the vegetation not being retarded. Captain Buller had procured some of Clayton's three-pronged forks, 18 inches long, for the purpose of ascertaining what could be done on this plan. They were worked by day-labourers, at the common wages of the country. They dug 6½ rods a-day of light, stony soil, thoroughly well, to the depth of 18 inches, at about 3d. a rod. He had been surprised at the amount, excellence, and economy of the work executed.—Mr. Rodwell, of Alderton Hall, had used the fork much on his own property in Suffolk. The forks were of the light spit kind, and the best were made in that county; they went to the depth of 18 inches, and turned the soil completely up. A thousand acres of land had been dug to that depth at from 2½d. to 3d. the square rod, for the purpose of taking up the chicory crop. The expense of this forking was from 30s. to 33s. 4d. per acre; and the labourers, during the winter months—from October to April—could earn from 10s. to 12s. per week.—Mr. J. Manwaring Paine being extensively engaged in hop cultivating, had his attention much directed to operations of the nature then referred to. He trenched at intervals, and every year dug 200 acres to a perpendicular depth of 18 inches. The cost was greater at the first digging. It cost him 24s. per acre to bring the bottom soil to the surface. It perhaps might be better to do it at two spits, in the same manner as Mr. Smith did, in which case it would