

molybdate solution to prevent the precipitation of iron and the separation of molybdic acid. The successful use of the molybdate method in these cases seems to warrant the conclusion that we are needlessly alarmed at the presence of, at least, some forms of organic matter in phosphate solutions.

The direct determination of the available phosphoric acid possesses several advantages. Only one determination is required instead of two as by the present method. The probable error is reduced one-half. We can also determine the soluble, reverted, insoluble, and total phosphoric acid in one sample and with one weighing where it now takes two samples and two weighings.

The saving of time effected by this method is of considerable importance in control and in factory laboratories, whether we use the citrate or the molybdate method, and it is hoped that the subject will receive further attention.

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### NOTE UPON THE DETERMINATION OF NITROGEN IN FERTILIZERS CONTAINING NITRATES.

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JOHN FIELDS<sup>1</sup> describes a modification of the Gunning method<sup>2</sup>. In this modification potassium sulphide alone is used in the place of potassium sulphate and sodium thiosulphate.

In Fields' hands the average difference between the methods is 0.02 per cent., the modification giving the higher average.

The writer has used this modification, carried out in a slightly different manner, with very satisfactory results. To the nitrate in the digesting flask are added thirty-five to forty cc. sulphuric acid containing thirty-four grams salicylic acid per liter. Allow to stand in the cold until the nitrate is dissolved. Add six or seven grams of finely broken potassium sulphide, heat over a low flame for fifteen minutes, then over the full flame until clear. Cool and distil as usual. The following are all the results I have obtained by this method.

<sup>1</sup> This Journal, 18, 1102.

<sup>2</sup> U. S. Department of Agriculture, Division of Chemistry, Bulletin 46.

No.	Gunning. Per cent.	Modification. Per cent.	No.	Gunning. Per cent.	Modification. Per cent.
608	{ 3.70 3.75	3.84	767	2.69	2.68
648	4.45	4.45	782	2.64	2.59
659	2.73	2.90	786	1.24	1.18
719	1.48	1.52	793	2.34	2.39
722	3.15	3.09	808	1.98	2.05
723	1.77	1.81	809	1.11	1.07
725	2.73	2.81	819	2.18	2.13
727	2.51	2.52	820	2.27	2.32
731	2.25	2.25	833	2.76	2.83
733	2.90	3.00	888	4.26	4.18
738	6.62	6.50	917	3.07	3.19
742	{ 5.99 5.75	{ 5.85 5.88	919	2.15	2.17
747	4.30	4.42	924	3.58	3.58
755	3.12	3.22	927	1.91	1.84
756	1.96	2.05	928	2.61	2.58
757	2.88	2.97	933	3.34	3.26
			941	2.90	3.04
Average difference + 0.017.					

The greatest difference between the methods is 0.17 per cent. and the average difference is 0.017 per cent. It is advisable to use a little more sulphuric acid in the digestion than is used in the Gunning method. There was no trouble with foaming, turning up the lamps being the only attention required. Time of digestion was about one and a half hours, being about a quarter of an hour longer than in the Gunning method. The modification seems to give as good results, requires fewer chemicals and less attention than the Gunning method, but requires a little longer digestion.

[CONTRIBUTION FROM THE LABORATORY OF AGRICULTURAL CHEMISTRY,  
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### NOTES ON TESTING SOILS FOR APPLICATION OF COMMERCIAL FERTILIZERS.<sup>1</sup>

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Received September 28, 1899.

FOR more than twelve years of active service in connection with farmers' institutes, the writer endeavored to impress upon the farmers the necessity of a more rational method in the

<sup>1</sup> Read before the meeting of the American Association for the Advancement of Science, August 26, 1899.