Table VI.—Analyses of New Zealand Superphosphates.

Laboratory No.	Districts received from.	Moisture.	Organic Matter.	Silica.	Monocalcic Phosphate.	Equal to Soluble Phosphate.	Tricalcic Phosphate.	Ferric and Aluminic Phosphate.	Calcic Sulphate.	Alkalies.	Nitrogen.	Money-value per Ton.
												£ s. d.
	College farm	14·72	31·58	3·25	8·33	10·99	23·18	..	15·39	2·90	2·65	6 2 0
10	"	18·10	28·17	2·60	16·16	21·49	3·91	0·50	28·98	1·58	1·22	6 1 3
19	Springston	5·90	37·22	4·28	14·18	18·85	5·32	1·65	28·22	3·23	0·84	5 4 9
39	Belfast	11·65	30·28	1·84	9·55	12·65	8·73	1·40	31·22	5·33	1·73	5 1 9
40	"	10·90	34·96	2·58	13·03	18·25	4·36	1·75	26·40	5·22	2·85	6 3 0
52	College farm	9·95	30·79	1·78	8·89	11·73	10·46	0·93	33·25	3·95	1·95	5 1 0
124	"	11·09	15·95	9·64	13·84	18·24	6·65	5·47	35·91	1·45	0·35	5 7 6
145	"	9·05	16·15	9·34	12·46	16·44	17·66	5·60	28·79	0·95	1·03	6 6 6
191	"	14·40	20·08	1·02	21·09	27·92	5·24	2·60	33·69	1·88	0·63	7 5 6
248	Auckland	18·66	16·45	11·26	9·56	12·65	5·67	2·30	34·69	1·41	1·65	4 13 3
249	"	18·16	11·48	15·60	5·60	7·41	9·60	6·80	32·88		0·78	3 12 3
257	Christchurch	15·35	45·65	3·90	9·88	13·09	4·58	1·45	17·22	1·97	3·85	5 8 6
263	Otaio	16·16	21·42	1·88	4·61	6·08	15·06	2·15	33·84	4·88	2·18	4 9 6
265	Green Park	9·13	39·35	2·72	14·50	19·14	9·38	1·70	17·05	6·17	3·36	6 19 0
272	Waikato	15·59	14·87	11·74	10·22	13·50	0·87	6·76	34·89	5·07	0·89	4 2 0
274	Springston	9·28	26·90	1·80	9·56	12·65	16·59	1·60	29·61	4·66	2·04	5 16 9
275	"	9·06	23·78	2·24	15·82	20·94	7·64	2·75	31·12	7·59	2·15	6 15 6
509	Otaio	7·43	53·93	4·32	12·69	16·80	2·83	2·36	12·30	4·14	5·46	6 7 6
511	Makihiki	6·87	39·62	3·56	15·82	21·94	5·24	5·80	15·21	7·88	3·01	6 15 6
577	Hororata	7·61	39·80	4·34	16·48	21·83	3·48	7·20	17·95	3·14	2·68	6 14 0
766	Greenpark	50·58		3·32	20·33	26·93	Nil	4·20	21·57		1·82	7 0 0
828	East Hamilton	18·81		2·30	20·99	27·70	5·23	1·60	51·07		2·63	8 10 0
886	Christchurch	37·62		2·78	22·30	29·52	2·83	3·80	27·40	3·27	1·12	7 10 6
887	"	44·82		2·94	21·32	28·22	0·43	3·90	32·97	3·62	1·68	7 8 0
888	"	39·72		4·52	21·32	28·22	0·87	4·10	29·03	0·44	1·26	7 3 6
761	"	40·03		4·56	20·00	26·50	0·43	5·60	29·38		2·03	7 3 9
757	Walton	35·51		7·34	17·38	23·01	6·54	4·90	28·33		1·48	6 15 6

For the purpose of rendering the analytical results more intelligible a few remarks on the different constituents are here given.

The term "organic matter" represents the loss on ignition. It is made up generally of animal-matter, which contains the nitrogen and combined water.

Silica includes sand and insoluble matter of no value.

Monocalcic Phosphate.—This is the most important constituent in a superphosphate, and on the amount present will depend the quality of the manure. Those containing over 20 per cent. may be considered high-class, those with from 10 to 20 per cent. medium-class, and those containing less than 10 per cent. poor-class superphosphates. The term "soluble phosphate" is used in the manure trade. This does not express the actual soluble monocalcic phosphate, but the amount of the original tricalcic phosphate that has been converted. The value of monocalcic phosphate in terms of soluble phosphate in any manure can be found by multiplying the percentage present by 1·3. This has been done in the analyses given for the purpose of comparison.

Tricalcic Phosphate.—This represents that portion of the original phosphate that has not been converted into monocalcic phosphate by the acid, and the percentage is always higher in cases where insufficient acid has been used; if in the form of bone it has a higher value than when derived from mineral phosphates, since it is then rendered more quickly available in the soil.

Calcic Sulphate.—The proportion of this constituent gives an indication in some cases of the nature of the original phosphate. If the amount present is much in excess of the quantity of monocalcic phosphate, then the original raw phosphate probably contained an excess of calcic carbonate, this, on decomposing, forming calcic sulphate and involving the waste of a corresponding quantity of acid.

Ferric and *Aluminic Phosphates.*—These substances are sometimes known as reduced or retrograde phosphates. They are formed when the raw phosphate contains iron and alumina. These bodies unite with a portion of the soluble phosphate, gradually forming insoluble compounds, and the proportion of monocalcic phosphate is thereby diminished. The term "reduced phosphate" is also often applied to a compound of lime and phosphoric acid, which is sometimes found in badly-made superphosphates, formed by the addition of more lime to the monocalcic phosphate. This dicalcic phosphate, as it is called, is less soluble than the monocalcic and more soluble than the tricalcic phosphate, and consequently may be considered intermediate in value between the two. It is formed when insufficient acid has been used in the manufacture of superphosphate, and also when undecomposed carbonate of lime is left in or added to the manure. A comparison of the results given of the imported with those of our New-Zealand-made superphosphates will show that the latter are much lower in grade with regard to monocalcic phosphate, but richer in organic matter and nitrogen. They are more of the character of bone superphosphates. In our superphosphates, as in our bonedust, nitrogen appears to be, comparatively, the cheapest manure constituent that we have. This is largely the outcome of our meat-freezing industry. With the phosphatic material available here, it is not likely that we shall