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Although Mr. Sturgeon has gone far out of his way to twist these phenomena into an accordance with certain theoretical views, and sets them up as being of an extraordinary kind, they are nevertheless of a very simple character, and are merely illustrative of a few well-known laws of electrical action.

[To be continued.]

XXI. *On a new Compound of Ferrocyanide of Potassium, with Cyanide of Mercury.* By ROBERT KANE, M.D., M.R.I.A.*

IT had frequently occurred to me to notice that, in the process for obtaining cyanide of mercury by the action of ferrocyanide of potassium on sulphate of mercury, it was necessary to observe accurately the equivalent proportions of these substances, in order to ensure success. If any ferrocyanide of potassium were present in excess, a corresponding deficiency in the quantity of the cyanide of mercury always occurred. I at last traced this circumstance to the fact, that the ferrocyanide of potassium in excess combines with the cyanide of mercury, to form a new substance so similar in appearance to the former of the two, as to be very easily confounded with it and thus rejected in the crystallizations.

This new salt is most easily prepared by dissolving together in a moderate quantity of water about one part of ferrocyanide of potassium in crystals with two of cyanide of mercury. On cooling, the new salt separates in the form of rhomboidal plates of a rich yellow colour, almost as deep as that of ferrocyanide of potassium. When heated, these crystals lose some water and become whitish and opaque, then blacken and yield cyanogen and mercury; the usual products of the decomposition of ferrocyanide of potassium remaining behind.

With a protosalt of iron, a solution of this new compound yields Prussian blue, and indeed, every reagent which acts on either constituent gives its characteristic reaction with this new body.

For its analysis very simple methods were sufficient.

Forty grains dried at 300° Fahr. lost 2·31 of water or 5·78 per cent.

The remaining 37·69 grains were dissolved in water, and then decomposed by a stream of sulphuretted hydrogen. The sulphuret of mercury was collected and dried. It weighed

* Communicated by the Author.

23.5 grains corresponding to 58.75 per cent. containing 50.13 mercury, equivalent to 63.05 of cyanide.

The liquor from which the mercury had been thus separated, was evaporated carefully to dryness, and the salt obtained was deprived of all water of crystallization by exposure to a temperature of 300°, until it ceased to lose weight. It then weighed 31.32. It was pure dry ferrocyanide of potassium.

A quantity of the new salt equal to 50.4 grains was ignited and incinerated; the residue then treated by muriatic acid, and the iron thrown down by ammonia added in excess. The oxide of iron weighed contained 2.23 of metallic iron, corresponding to 4.47 per cent.

The liquor after the separation of the iron was evaporated to dryness, and ignited; there remained chloride of potassium, equal to 12.3, containing 6.51 potassium or 12.91 per cent.

This new salt, therefore, contained

Mercury.....	50.13
Iron	4.47
Potassium	12.91
Water.....	5.78
Loss and cyanogen	26.71
	<hr/>
	100.00

The relation is exactly such that the mercury employs half of the cyanogen to form cyanide of mercury, and the remaining half forms with the potassium and the iron common ferrocyanide of potassium: the result as calculated should be

3 atoms mercury	304.2	50.26
2 ——— potassium	79.4	13.11
1 ——— iron	28.0	4.62
6 ——— cyanogen.....	157.8	26.07
4 ——— water.....	36.0	5.94
	<hr/>	<hr/>
	605.4	100.00

The existence of this salt is of considerable practical importance, as it shows the necessity of avoiding any excess of ferrocyanide of potassium in preparing cyanide of mercury; an error into which, from motives of economy, the manufacturing operator would be peculiarly liable to fall.

23, Gloucester Street, Dublin, Dec. 23, 1839.