LXVIII.—*Note on Safranine.*

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THIS beautiful colouring matter was discovered by W. H. Perkin, F.R.S., who found that it is a bye-product of the manufacture of mauve, and formed by the oxidation of mauveine (*Proc. Roy. Inst.*, **5**, 572). Some time afterwards we commenced an investigation on this subject, and prepared a quantity of safranine, by adding gradually manganese dioxide to a boiling solution of mauveine in dilute sulphuric acid, as long as any effervescence took place: we boiled then for some time until the solution had assumed a clear red colour, neutralised with sodium carbonate, and filtered. On the addition of common salt to the filtrate, impure safranine was precipitated.

The residue on the filter contained a purple colouring matter which we first supposed to be undecomposed mauve; but this is not the case, inasmuch as it does not yield safranine, but colourless oxidation-products.

The impure safranine to which this purple colour obstinately ad-

heres was purified by treating its concentrated solution with soda, filtering, throwing out with salt, and repeating these operations until the admixture was removed. The product thus obtained was, after recrystallisation from hot water, found to be neither a base nor a sulphate, but a chloride, which was further purified by recrystallisation from hot dilute hydrochloric acid. It forms beetle-green crystals, resembling strongly those of magenta.

While this investigation was going on, Hofmann and Geyger published a paper on commercial safranine, which, however, is not obtained from mauveine, but from orthotoluidine (*Deut. Chem. Ges. Ber.*, **5**, 526). Now as mauveine is undoubtedly derived from pure aniline, it appeared very probable that the two safranines were not identical (Schorlemmer, "Carbon Compounds," 408). On the other hand, our product showed all the characteristic reactions of that examined by Hofmann and Geyger. The only difference that we could find was, that the chloride of commercial safranine forms, according to Hofmann and Geyger, thin reddish crystals; and further that the analysis of our compound gave less carbon and hydrogen than required by the formula $C_{21}H_{21}N_4Cl$.

We did not then continue this research, but since E. and O. Fischer have found that homologous rosanilines exist, it appeared to us not improbable that this might also be the case with safranine, our body being the lower homologue of the compound obtained from orthotoluidine, and therefore having the formula $C_{20}H_{19}N_4Cl$. In fact our analytical numbers agree with this supposition:—

	Calculated.	Found.					
Carbon	68·47	67·92	67·86	—	—	—	—
Hydrogen ..	5·42	5·51	5·47	—	—	—	—
Nitrogen ..	15·98	—	—	15·38	—	—	—
Chlorine ..	10·13	—	—	—	10·34	9·90	9·82
	<hr/> 100·00						

The numbers obtained for carbon and hydrogen appear to be the most decisive, differing considerably from those of Hofmann and Geyger, who obtained the following results:—

	Calculated.	Mean found.
Carbon	69·14	68·52
Hydrogen	5·76	6·15
Nitrogen	15·36	15·17
Chlorine	9·74	9·98
	<hr/> 100·00	<hr/> 99·82

We are continuing this research in order to establish the true formula of safranine from mauveine, and also, if possible, to ascertain the constitution of these compounds.