which I am indebted to Dr. I. E. Trofimoff, has also revealed a normal chromosome complement.

The fact that in all cases where it could be proved, the crossing-over in males took place in the central region of the chromosome, *i.e.*, in the same region where crossing-over is increased by x-rays in females, seems to indicate an identical mechanism of crossing-over in both sexes, and shows that the absence of normal crossing-over in males is not due to its impossibility during spermatogenesis.

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THE ACTION OF AMMONIA ON PHENOLS

THE recent article by Van Slyke and Hiller on the determination of ammonia in the blood,[1] in which the blue color developed with ammonia, phenol and hypochlorite is utilized, suggests comment from us, since we have been engaged on a somewhat analogous problem.

It has long been known that ammonia (or one of its salts, or some of its organic derivatives) gives an intense blue color with phenol in the presence of an oxidizing agent, such as sodium hypochlorite. The mechanism of this reaction has not been fully cleared up, though it is believed by some that quinonechlormid is one of the products.

Phenols, in general, give various colored solutions with ammonia (or its salts) and an oxidizing agent; and from our own experience, it may be suggested that for a qualitative test, the reaction compares very favorably with the ferric chloride test. We were hopeful that one of these phenol-ammonia color reactions might lend itself to the quantitative estimation of ammonia in urine. Orr[2] had already used phenol itself for this purpose; and for a time we confined our attention to the possibility of using some phenol other than phenol itself. Some 20 different phenol and phenol-like compounds were investigated. Of this number, thymol held out the most promise; but actual comparison of thymol with phenol forced us to the conclusion that the color developed with the latter was more stable and more pronounced than that developed with thymol; and that, therefore, phenol itself was more adapted for use in quantitative colorimetric determinations.

Incidentally, we have had occasion to repeat Orr's work, and to confirm it in its main essentials. We first made up solutions of ammonium sulfate of known strength and estimated the ammonia colorimetrically by adding phenol and sodium hypochlorite, as outlined by him.

[1] *Jour. Biol. Chem.*, 102: 499, 1933.
[2] Orr, *Biochem. Jour.*, 18: 806, 1924.

Original solution mg per cc	Estimated
.025	.026
.05	.05
.06	.06
.07	.07
.08	.08
.09	.09
.15	.16
.20	.20
.25	.24
.30	.28

We next determined the ammonia in several samples of urine (obtained from patients at the hospital) and compared the results with those obtained by Folin's aeration method.

Same	Folin method	Colorimetric estimation
1	0.36	0.39
2	0.27	0.26
3	0.31	0.32
4	0.48	0.51
5	0.54	0.54
6	0.26	0.32
7	0.44	0.45
8	0.49	0.49
9	0.50	0.51
10	0.38	0.37

It will be seen that the phenol-ammonia method compares very favorably with the method devised by Folin.

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