

decrease in proportion to the lowering in the rate of superficial evolution of CO₂.

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¹ Singh and Mathur, *Nature*, 1936, **137**, 704; *Curr. Sci.*, 1936, **5**, 76.

² Wardlaw and Leonard, *Ann. Bot.*, 1936, **50**, 621.

³ Wardlaw, *ibid.*, 1936, **50**, 655.

⁴ Smith, *Hilgardia*, 1929, **4**, 273.

Choline Ester Formation by Pancreas.

QUASTEL and his associates (1936)¹ have demonstrated the formation of Choline ester *in vitro* by the cortex of rat's and guinea-pig's brain. We have repeated their observations on dog's brain by following their technique and using frog's *rectus abdominis* as the test preparation. Our results show that dog's cortex forms choline ester at the rate of about 1 γ per gm. of fresh tissue per hour (calculated from the yield in 4 hours). We also found that dog's pancreas showed considerable activity in forming the choline ester producing about 0.25 γ per gm. of fresh tissue per hour (calculated from the yield in 4 hours).

Two important points emerged in our experiments on pancreas. First, that choline ester formation with or without oxygen was the same in the case of pancreas (in the case of brain, choline ester formation in the absence of oxygen was very much less); secondly in the absence of oxygen both the brain and the pancreas formed H₂S, the H₂S formation being greater in the case of the pancreas. We at the same time estimated the normal choline ester content of the pancreas and found that the amount present was less than what could be detected by the frog's *rectus muscle*.

We also estimated the choline esterase activity of the dog's pancreas and found that it was very high, being approximately twice as much as that of the brain cortex. Choline ester formation by a tissue so rich in its choline esterase activity is significant.

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¹ Quastel, J. H., *et al.*, *Biochem. J.*, 1936, **30**, 1068.

An Indirect Method of Estimating Cocaine in Mixtures of Cocaine and Novocaine.

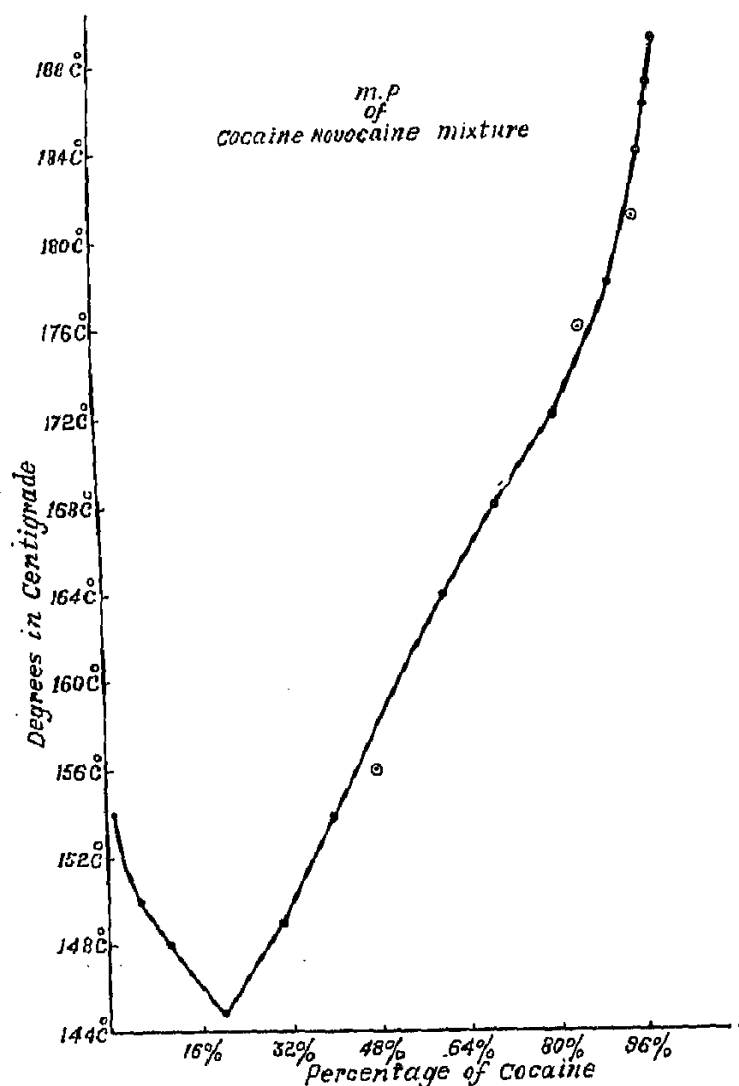
It was thought desirable to discover a method by means of which cocaine could be rapidly estimated in mixtures of cocaine and novocaine, the latter being the usual adulterant of smuggled cocaine. The importance of such a method of estimation would be apparent from the study of the Dangerous Drugs Act.

We first tried to see how far Hankin's test for detecting cocaine could be utilised to throw light on the problem. With this object in view the sensitiveness of the test¹ was first studied and it was found that cocaine-permanganate crystals are obtained from mixtures of cocaine and novocaine only when cocaine is present to the extent of more than 5 per cent. It should be clear therefore that prosecution could be safely started if a seized sample gave the Hankin's test by direct treatment, for according to the Dangerous Drugs Act if a sample contains more than 0.1 per cent. of cocaine it may be considered to be a dangerous drug.

It was thought that the determination of the melting points of cocaine-novocaine (hydrochloride) mixtures might give some indication about the percentage of cocaine present. With this object in view melting points of mixtures of cocaine and novocaine hydrochlorides were taken. These results are given below and also outlined in the accompanying graph.

Cocaine Hydrochloride per cent.	Novocaine Hydrochloride per cent.	M. P. ° C.
99	1	188-89
98	2	186-87
97	3	184-86
96	4	181-84
95	5	179-81
91	10	170-78
85	15	155-76
80	20	151-72
70	30	151-68
60	40	149-64
50	50	147-56
40	60	145-54
30	70	144-49
20	80	140-45
10	90	147-48
5	95	147-50
1	99	150-54

These results are highly interesting and show that one can get a shrewd idea about the extent of the presence of cocaine by mere determination of the melting point. Thus if it were first proved that the mixture contained only novocaine and cocaine—as is very often the case in actual practice—and the melting points were to be above 155° , one can safely say that cocaine (hydrochloride) was present to the extent of more than 50 per cent.



Cocaine can be rapidly and quantitatively estimated when found admixed with novocaine in the following manner:—

The mixture (2–10 mg.) is dissolved in water and treated with slight excess of sodium nitrate in presence of dilute sulphuric (slight excess) acid and the reaction is allowed to go on for three minutes. The whole is then carefully treated with 5 c.c. of 10 per cent. sodium hydroxide solution and the resulting mixture is treated with 1 c.c. of 1 per cent. β -naphthol solution. The colour produced is matched against that obtained

from a suitable standard solution of novocaine in a Dubosque colorimeter and the amount of novocaine present in the mixture calculated. Cocaine does not interfere in the reaction as it does not contain any NH_2 group and the amount of cocaine present is obtained by difference. Experiments were made with mixtures containing 1 to 99 per cent. of cocaine and the results obtained were invariably within 1 per cent. of the theoretical results.

The methods described in this paper should prove to be particularly valuable in analytical laboratories where thousands of samples of cocaine have to be examined every year and where generally only a very small quantity of the sample (about a grain) is available for analysis.

We reserve for a future communication an account of a new method of directly estimating cocaine when present, admixed with other substances.

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¹ *Analyst*, 1911, 36, 2-6.

X-Ray Investigation of the Crystals of Acenaphthene.

THE crystals of acenaphthene have been studied by Bragg¹ by the X-ray powder method. The attention of the authors is drawn to a recent publication by Banerjee and Sinha² who have studied these crystals by the rotating crystal method. In the connection the authors have to point out that they had also studied them by the same method and one of them (De Sosal) had submitted the results of his investigation as a part of his thesis for the M.S. degree to the Bombay University in September 1936. The results (given below) obtained by the authors are nearly the same as obtained by Banerjee and Sinha.

The rotation photographs taken about a , b and c axes give
 $a = 8.31$ A.U. ; $b = 14.07$ A.U. ; $c = 7.21$ A.U.
 Planes identified on the oscillation photographs taken about the three crystallographic axes show that $(0kl)$ planes