the 1% cobalt nitrate solution is added to the residue. This is dried by warming over a flame and then the paper is exposed to ammonia fumes by holding it over the mouth of a bottle containing strong ammonia solution. A positive reaction is shown by the development of a reddish-violet colour in the region of the residue. The colour is best seen by transmitted light.

Weak reactions may sometimes be intensified by adding another drop of cobalt nitrate solution. The colour given by a strong positive reaction is fairly stable, but a weak positive reaction tends to fade after a few minutes.

The time required for carrying out this procedure is less than 15 minutes.

Results

Tests were carried out on solutions of the common barbiturate derivatives in urine. The solutions were made up from powder or from the commercial tablets; the derivatives used, together with the results obtained, are shown in the Table.

Results of Tests

Barbiturate Derivative	Concentration per 100 ml. of Urine		
	2 mg.	1 mg.	0.5 mg.
Soluble barbitone ..	++	—	—
.. phenobarbitone ..	++	++	—
Amylobarbitone sodium ..	++	++	+
Quinalbarbitone ..	++	+	—
Butobarbitone ..	++	++	+
Pentobarbitone ..	++	+	—
"Allonal" ..	++	++	+

++ = Positive. + = Weak positive.

The use of a larger volume of urine made weak positive reactions rather stronger, but strong positive reactions were not appreciably affected. The urine of patients having therapeutic doses of barbiturate derivatives were also tested. The urine of patients having barbitone or soluble barbitone (0.3–0.6 g. daily) gave a positive reaction in every case, the urine of patients having phenobarbitone (0.03 g. thrice daily) gave a weak positive reaction in four specimens out of ten tested. The shorter acting barbiturates could not be detected in the urine of patients receiving therapeutic doses. In none of the barbiturate-free urines tested was a false positive reaction obtained.

Comment

From the point of view of detection the barbiturate derivatives can be divided into two main groups. First, the "long-acting" barbiturates such as barbitone and phenobarbitone, which are excreted in the urine in considerable quantities and can be easily detected even after therapeutic doses; and, secondly, the "short-acting" barbiturates, which are for the most part metabolized and are excreted in the urine in small quantities only.

If poisoning is due to one of the longer-acting barbiturates it should be easily detectable in the urine. The shorter-acting barbiturates, even though producing coma, will probably not be excreted in the urine in sufficient quantities to give a positive reaction with a rapid method of detection such as is described here, and in these cases the barbiturate is more likely to be detected in stomach washings.

The first 500–1,000 ml. of stomach washings should be saved separately for detection of barbiturates. If these first washings are diluted with the rest of the water required for complete stomach washout, then the subsequent detection of barbiturate is more difficult.

Summary

In cases of suspected barbiturate poisoning it is of value to confirm the presence of barbiturates in urine or stomach contents before treatment is begun.

A method is described whereby barbiturates can be detected in concentrations of the order of 1–2 mg. per 100 ml. of urine. The time required for performing the test is less than 15 minutes.

REFERENCES

- Denis, X., and Lambrechts, A. (1940). *Rev. belge Sci. méd.*, **12**, 247.
Goldbach, H. J., and Opfer-Schaum, R. (1949). *Klin. Wschr.*, **27**, 706.
Griffon and Le Breton (1938). *J. Chim. Pharm.*, **28**, 49.
Kresbach, H., and Gomahr, H. (1951). *Wien. klin. Wschr.*, **63**, 476.
Merley, R. W. (1948). *Amer. J. clin. Path.*, **18**, 906.
Selwyn, J. G., and Dark, F. A. (1950). *J. clin. Path.*, **3**, 152.

Medical Memorandum

Peripheral Neuritis Following Tetraethylthiuram Disulphide Treatment

Tetraethylthiuram disulphide ("antabuse") has been in use since 1948 for the treatment of alcoholism. No case of peripheral neuritis has been fully reported, although three cases were mentioned as occurring among 120 alcoholics treated with the drug (Child *et al.*, 1951).

CASE REPORT

A man aged 40 had been drinking since the age of 16. His job as a waiter gave him ample opportunity to indulge, and so by 1948 he was consuming two bottles of gin a day. This state of affairs continued until his admission in July, 1952. The medical history was negative apart from gonorrhoea at the age of 21. Examination showed him to be a small man with an aggressive, mildly hostile, and suspicious manner. No physical abnormality was detected: the blood pressure was 146/94. His intelligence was a good average, there being no sign of intellectual impairment. The blood Wassermann reaction was negative and the sedimentation rate normal. Van den Bergh and thymol turbidity tests were negative. Plasma proteins were normal.

On August 8 he was given 1.5 g. of tetraethylthiuram disulphide; this was followed by 0.5 g. daily. An alcohol/tetraethylthiuram-disulphide test reaction was carried out six days later without any untoward effect, and the patient left hospital on October 15, continuing to take the drug and remaining abstinent. At the end of November he noticed tingling sensations in his toes, with numbness, which progressed to involve the anterior third of the feet. Examination revealed a loss of sensation to light touch, pin-prick, and vibration over the anterior third of both feet, together with some diminution in the ankle-jerks. He had to give up his work because of the symptoms. On December 18 he stopped taking the drug because he felt it might have been responsible for his symptoms, since when there has been a gradual improvement in his condition.

COMMENT

Although the development of peripheral neuritis in alcoholics is to be expected, the development of the condition in this case seems to have followed 16 weeks' treatment with tetraethylthiuram disulphide while the patient was abstinent. During his stay in hospital his nutritional intake was good and he gained 10 lb. (4.5 kg.) in weight.

Tetraethylthiuram disulphide can lead to a variety of toxic symptoms, chiefly tiredness, headache, and mild ataxia. Electroencephalographic changes have been reported (Guild and Epstein, 1951). Several authors describe toxic confusional states following its use (Bennett *et al.*, 1951; Guild and Epstein, 1951; Martensen-Larsen, 1951). Such reports would indicate that considerable caution should be exercised in giving tetraethylthiuram disulphide over long periods of time, for it seems possible that the nutritional deficiencies occurring in alcoholics may increase the susceptibility of these patients to the toxic effects of the drug.

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REFERENCES

- Bennett, A. E., *et al.* (1951). *J. Amer. med. Ass.*, **145**, 483.
Child, G. P., *et al.* (1951). *Amer. J. Psychiat.*, **107**, 774.
Guild, J., and Epstein, N. B. (1951). *Quart. J. Stud. Alcohol*, **12**, 360.
Martensen-Larsen, O. (1951). *Ibid.*, **12**, 206.