Table 1. Pentose-Nucleic Acid (PNA) Content of Various Subcellular Fractions in Normal Rat Brain and After 'Metrazol' Convulsions

PNA fraction		Control	'Metrazol' convulsive	Percentage of change
Nuclear	Soluble Nucleolar	6·4 ± 0·73 (12)	4·8 ± 1·04 (12)	−25
		27·4 ± 4·4 (12)	20·6 ± 4·5 (12)	−24
Cytoplasmic	Soluble Microsomal	22·5 ± 3·6 (12)	21·8 ± 5·0 (12)	− 3·1
		52·6 ± 5·2 (10)	49·4 ± 5·3 (12)	− 6
Total	Nuclear Cytoplasmic (excluding mitochondrial)	33·8 ± 4·4 (12)	25·5 ± 4·0 (12)	−24·5
		75·6 ± 9·6 (10)	71·3 ± 6·3 (12)	− 5·6
Total (cytoplasmic + nuclear)		107·8 ± 15·8 (10)	96·8 ± 13·6 (12)	−10·2

The figures in parenthesis indicate the number of animals used. The brains of two animals were pooled together for obtaining a single observation. Values are expressed in μgm./100 mgm. wet weight of tissue. Against each value, the mean standard error is given.

in neurons in tissue culture when subjected to electrical stimulation or 'Metrazol' action.

This fall in nuclear pentose-nucleic acid may be due to an enhanced activity of ribonuclease in the nucleus as a result of convulsive activity or it might indicate an increased passage of pentose-nucleic acid from the nucleus to the extra nuclear compartments in convulsive or electrically stimulated states. Relationship of these changes with the functional activity of the neurons is not yet defined.

G. P. Talwar
B. Sadasivudu
V. S. Chitre

All-India Institute of Medical Sciences,
New Delhi 16.

[1] Hyden, Holger, *Acta Physiol. Scand.*, **6**, Supp., 17 (1943).
[2] Geiger, A., Yamasaki, S., and Lyons, R., *Amer. J., Physiol.*, **184**, 239 (1956).
[3] Sadasivudu, B., and Talwar, G. P., *Symp. on Adv. Frontiers of Life Sci.* (National Inst. Sci. India) (in the press).
[4] Goodman, L. S., Grewal, M. S., Brown, W. B., and Surinyard, E. A., *J. Pharmacol.*, **108**, 168 (1953).
[5] Alfrey, V. G., Osawa, S., and Mirsky, A. E., *J. Gen. Physiol.*, **40**, 451 (1957).
[6] Osawa, S., Takata, K., and Hotta, Y., *Biochim. Biophys. Acta*, **28**, 271 (1958).
[7] Schweet, R., Lamform, H., and Allen, E., *Proc. U.S. Nat. Acad. Sci.*, **44**, 1029 (1958).
[8] Alfrey, V. G., and Mirsky, A. E., *Proc. N.Y. Acad. Sci.*, **43**, 821 (1957).
[9] Scott, J. F., Fraccastoro, A. P., and Taft, E. B., *J. Histochem. Cytochem.*, **4**, 1, (1956).
[10] Geiger, R. S., *Fed. Proc.*, **15**, 71 (1956).

Rapid Infra-Red Determination of Acetone in the Blood and the Exhaled Air of Diabetic Patients

There has long been a need for a rapid method for the quantitative determination of acetone in the blood and in the exhaled breath of the patient with diabetes mellitus. Since these concentrations are a direct reflexion of the diabetic state, precise acetone measurements would provide the physician with more accurate data with which to evaluate his diabetic patient. To be clinically practical, this analytical method should be specific, sensitive and rapid. An extension of an infra-red method previously reported[1] provides the basis for this preliminary report on the analysis of actone in blood and in the expired air.

To determine the acetone in blood, a 10-ml. oxalated sample is pipetted into a 40-ml. glass centrifuge tube fitted with a ground-glass stopper. 15 ml. of carbon disulphide is added, and the tube gently shaken for 10 min. on an automatic shaker. The tube is then centrifuged in a refrigerated centrifuge for 5 min. at 1,500*g*. The solvent layer is transferred to a 15-mm. infra-red sample cell and the absorbance at 8·25μ measured. To compensate for solvent absorption a matching cell filled with carbon disulphide is placed in the reference beam of the spectrometer. The minimal amount of acetone detectable in blood by this solvent extraction technique is 1·5 mgm. per cent (15 p.p.m.). The standard deviation in the analysis of a sample of blood containing 13·7 mgm. per cent of acetone is 0·76 mgm. per cent, while that of a 61·4 mgm. per cent acetone in a blood standard is 2·2 mgm. per cent.

Expired air for acetone analysis is collected by having the diabetic patient slowly exhale into a 10-l. 'Saran' bag. This expired air is allowed to flow into an evacuated gas cell of path 40-m. long mounted on a Perkin–Elmer model 221 infra-red spectrophotometer. The absorbance at 8·25μ is measured to determine the concentration of acetone. The minimal amount of the compound detectable is 10 μgm./l. of expired air. The standard deviation in an air sample containing 600 μgm./l. is 31 μgm./l.

The infra-red analysis of blood acetone has proved to be clinically practical. It provides a precise measurement of acetone in the case of diabetic acidosis, obviating the use of the 'Acetest' method for estimating the degree of ketonæmia by serial serum dilutions. Because of the sensitivity of the method, blood acetone may be determined when present in concentrations below the sensitivity of the 'Acetest' tablet.

The determination of acetone concentration in the expired air by this method is most promising. It has been possible to detect acetone in the breath of patients with blood concentrations less than 1·5 mgm. per cent, and in the acidotic diabetic it has proved to be the most rapid means of establishing the exact degree of acidosis. As the concentration of air in the alveoli parallels the concentration in the blood, the effect of treatment of the diabetic in acidosis is easily ascertained.

Richard D. Stewart
Department of Internal Medicine,
University of Michigan Medical Center.
Edward A. Boettner
Bruce T. Stubbs
Institute of Industrial Health,
School of Public Health,
University of Michigan,
Ann Arbor, Michigan.

[1] Stewart, R. D., Erley, D. S., Torkelson, T. R., and Hake, C. L., *Nature*, **184**, 192 (1959).

Influence of Scurvy and Lathyrism (Odoratism) on Hydroxyproline Excretion

Since nearly all the hydroxyproline in the body is found in collagen, it has been suggested[1–3] that abnormal amounts of hydroxyproline may be excreted in conditions which alter the metabolism of collagen. The availability of a specific and relatively simple method for analysing hydroxyproline in urine[4] encouraged us to measure hydroxyproline excretion in scurvy and lathyrism (odoratism), two experimental conditions known to affect collagen.