

error. Sutherland, Stowers, and McKenzie (1970) found the range of concentration of ascorbic acid in urine obtained from patients attending antenatal clinics was 1.0-2.3 mg/100 ml with a mean of 1.6 mg/100 ml. The method described here shows normal recovery of glucose in the presence of 10 mg/100 ml of ascorbic acid. Interference by ascorbic acid in this method is therefore not likely to be significant unless the patient has been taking large doses of vitamin C daily.

In order to check the precision of the method 24 estimations were performed on urines with a mean glucose concentration of 3.32 mg/100 ml and gave an SD = 0.12 and a coefficient of variation of 3.59%, and 20 estimations were made on urines with a mean glucose concentration of 6.51 mg/100 ml which gave an SD = 0.18 and coefficient of variation of 2.7%.

The automated method described in this paper has been performed on 500 specimens of early morning urine in parallel with the simple Uriglox<sup>1</sup> paper strip test. The results obtained confirmed the claims of the manufacturers that a positive Uriglox test is indicative of an urinary glucose concentration of less than 2 mg/100 ml.

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Supplied by William R. Warner and Co Ltd, Eastleigh, Hampshire.

## An apparatus for the thawing of stored blood in liquid nitrogen

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Thawing of glycerolized donations of frozen blood from liquid nitrogen storage requires some form of rapid agitation of the container in a large volume of water at around 40°C (Hurn, 1968). This can be achieved by a variety of modified water baths. We wish to report our experiences using a modified (second hand) domestic washing machine for this purpose. Models with centre spindle agitators and a means of thermostatically maintaining the temperature of a pre-heated water load are best, such as the Hotpoint Empress (fig 1). The central agitator spindle is tapped to take a standard screw, holding an angled strip of heavy gauge aluminium. To this is attached a wooden frame with four equidistant riccles removed to take the aluminium canisters

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Fig 1 Main thawing unit.

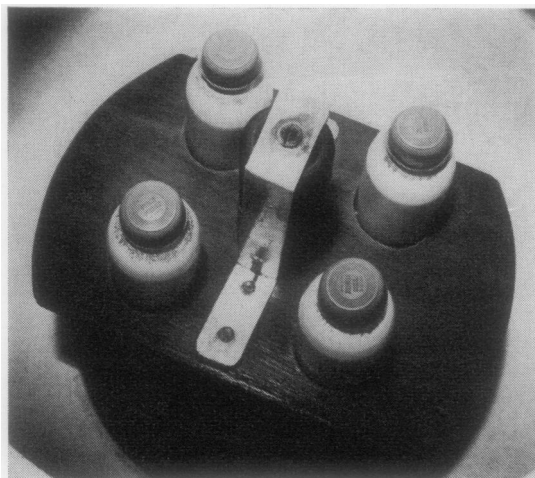


Fig 2 Central agitator assembly

(Jenkins and Blagdon, 1971; Mitchell and Muir, 1972). Their bases rest on the lower flange on the agitator, and the frame height is set so that canisters are immersed to the shoulder (fig 2). Our machine requires 40 litres of water, and thawing is complete within 10 minutes. The temperature changes when four canisters are thawed with the heater on and with the heater off are shown in table I. It can be seen

successfully thawed and processed some 400 units of blood (Mitchell and Muir, 1972). Supernatant haemoglobin values in the final product before issue for patients are shown in table II. A previously tried

	Series 1 (74 units) (mg Hb/dl)	Series 2 (26 units) (mg Hb/dl)
Immediately after thawing	398	285
SD±	259	80
Final product	197	117
SD±	199	70

Table II Supernatant haemoglobin values

washing unit in which the canisters were held stationary during the thawing process is given for comparison (series 1).

These values are well within the accepted levels of supernatant haemoglobin (Spielmann and Seidle, 1970). All units processed have been transfused without adverse effect. The modifications described were easily made in our own workshop and costs are minimal. It is important in deciding cost benefit of machines used for frozen blood work to remember the statement by Hurn (1968): 'Machinery which is unused means expenditure without product.'

The system as described has more than justified its low cost. It may be of interest to others in this field.

Temperatures of Water Bath in °C with and without Heater

Time (min)	Begin	0	2	4	6	8	10	12
Heater off	40	38.5	36.5	35	34	33.5	33	33
Heater on	40	39	38	37.75	37.75	38	39	38

Table I Temperature changes with heater on and off

that even with a large volume of water in the agitator bath, there is a marked lowering of temperature.

The lid of the washing machine is held firmly down by two strong metal clips mounted on the side casing. This minimizes any danger caused by pressure rupture of canisters due to gas leakage. We have used this system for over a year, and have

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