In addition to the applications described, the procedure is likely to prove particularly useful for the demonstration of antibodies in toxoplasmosis and malarial infection and may also be of value in the detection and serological typing of antigen by the use of specific antisera.

We wish to thank Dr E. J. Holborow for his helpful comments and encouragement, and Mr T. Plumridge who constructed the equipment.

Reference

Goldman, M. (1968). In *Fluorescent Antibody Methods*, p. 148. Academic Press, New York and London.

Single-channel AutoAnalyzer modified to provide two channels

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The existing single channel AutoAnalyzer (Technicon Instruments Co.) in this laboratory has been modified to provide two independent channels at a saving of approximately £900 over the cost of purchasing a second single-channel system.

The modifications were confined to the sampler, proportioning pump, and voltage stabilizer modules, and require the minimum of workshop facilities.

The modification of a sampler model no. 1 is described because the necessary finance to purchase the superior sampler model no. 2 (£404) was not available, and may be of interest to those laboratories in similar circumstances. The purchase price of £404 is included in the total saving.

Sampler Module (Sampler Model No. 1)

Three stainless steel rods, 6 cm long and 8 mm in diameter, were bolted onto one sample plate in place of the three studs which support a plate cover. The rods were bored at their free ends, so that they fitted snugly over the studs of a second sample plate. The block supporting the sample crook was replaced with one 9·4 cm high made from brass, to provide a fulcrum for a second crook. Both crooks were connected together with 'swinging arm' extension pieces made from steel, as shown in Figure 1. This construction permits the correct oscillation and synchronization of the upper sample crook, since both crooks are operated by the original mechanism fitted with a stronger return spring.

Proportioning Pump Module

A platen assembly (Technicon) was spring mounted in the conventional Technicon manner onto a rigid wooden box made to the same dimensions as the proportioning pump module. The box was fitted with a stainless steel top, onto which was bolted a roller head hinge block, a drive shaft guide bearing, both made from brass, and a roller head assembly locking device made from steel.

The original roller head drive shaft was replaced with one 13 cm long made from steel, with a female coupling brazed onto it at one end. This new shaft was inserted through the chain

Actual Conversion Cost	£	s	d
Colorimeter	347	0	0
Single pen recorder	438	0	0
Roller head assembly complete	62	10	0
Platen complete with springs	8	2	0
Separator plate	2	2	0
Dialyzer plates	26	8	0
Gaskets		11	0
	884	13	0
Less discount	74	18	0
Technicon account	809	15	0
Add voltage stabilizer	10	10	0
Labour costs	20	0	0
	£840	5	0

Technicon Quotation for Second Channel	£	s	d
1 Sampler II module			
1 Two-speed proportioning pump			
1 Colorimeter			
1 Transformer voltage stabilizer			
1 Single pen recorder			
1 Chart reader and general purpose comparator			
	1,733	0	0
Less chart reader and comparator	21	8	6
	1,711	11	6
Add equipment for double dialysis	29	1	0
	£1,740	12	6

Table *A single-channel AutoAnalyzer modified to provide two channels*

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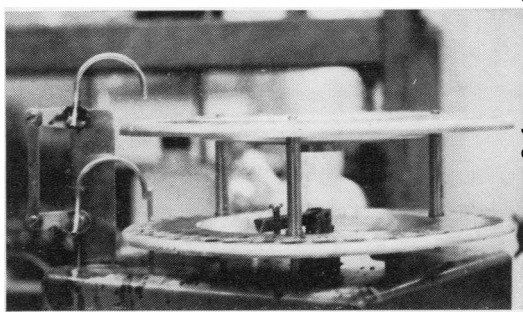

Fig. 1 *The sample plates and double sample crook arrangement. The horizontal arms from the sample crooks extend 2·5 cm. They are joined by a steel strip 6·2 cm long.*

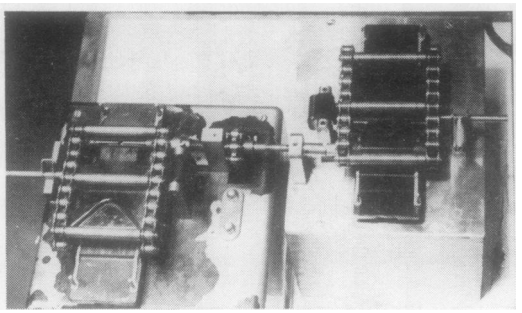

Fig. 2 *The new pump harnessed to the old.*

drive sprocket, through the guide bearing on the new box, and had a second female coupling secured to its free end with allen screws (Figure 2).

To provide additional rigidity, and to maintain the drive shaft location, the complete unit, consisting of the original pump and new platen unit, was mounted on a formica-covered wooden base.

The motor in the original pump, which is four years old, has proved adequate to cope with the additional load.

Voltage Stabilizer Transformer Unit

To operate two colorimeters simultaneously, the original 25-watt output Volstat was replaced by one with a 50 watt output, but with the same input and output voltage. This unit was purchased from Advance Components Ltd. for £10 10s 0d, and was located and wired up in the same position as the original.

Other Modules

A second set of dialyzer plates and accessories, colorimeter, and recorder, purchased from Technicon Instruments Co., was set up according to the manufacturer's instructions.

I wish to thank Mr Ryan, hospital group engineer, and his staff, and Mr Greer for their engineering work, and Dr Wade, consultant pathologist, for encouraging this project.

An embedding and sectioning technique for immunohistochemical studies of minute specimens of tissue

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Freezing very small tissue blocks, eg, needle biopsies, and cutting these specimens, are fairly difficult techniques. Besides, attention must be paid to storage of these frozen tissue specimens, as repeated study may be necessary. In order to obtain and to keep frozen tissue in a good morphological state the following are necessary precautions: (1) Fixation and refixation on the microtome chuck for cryostat sectioning must be possible. (2) Thawing, even only partially, and damaging of the tissue must be absolutely impossible. (3) Interference with histochemical reactions must be excluded.

Although several embedding techniques for minute tissue specimens which fulfil the above conditions are known, eg, in a gelatin-sephadex mixture (Bonomo, Tursi, and Del Zotti, 1964), we developed an embedding method which made the fixation on the cryostat microtome chuck, the cutting of morphologically good sections, and the storage of the tissue specimens quite easy.

Method

Before a minute tissue specimen is received, 10% gelatin (Difco) solution in saline is prepared and kept fluid at +25°C. The tissue specimen is placed in a gelatin capsule no. 3 (Lilly, Basingstoke, Great Britain). A little fluid gelatin is dropped on the bottom and against the side wall of a thin metal container and the gelatin capsule with the tissue specimen is placed on the congealing gelatin lump to keep it upright. Then the gelatin capsule is carefully filled with fluid gelatin (Figure 1). After this procedure the tissue is immediately snap-frozen, preferably in liquid nitrogen (−196°C), by sinking about half of the metal container into the freezing medium. Free inflow of liquid nitrogen into the metal container must be avoided, as the gelatin capsule may then crack.

For sectioning purposes a specimen holder from an ultramicrotome (Reichert) is fixed on a cryostat chuck (Figure 2). When the specimen holder is kept at −20°C in the cryostat, the frozen

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