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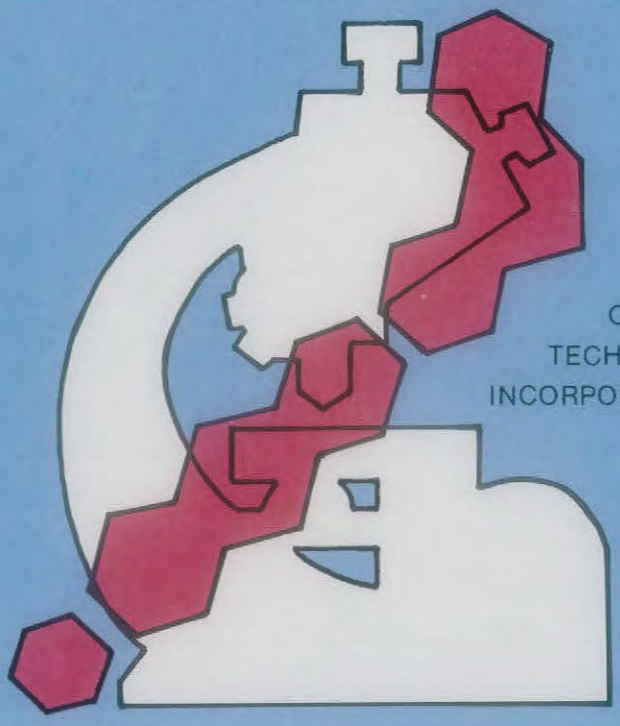

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Technical Evaluation of the Shimadzu Micro-Flow Spectrophotometer CL-720

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Received for publication 4 February 1982

Abstract

The Shimadzu Micro-Flow CL-720 Spectrophotometer has been technically evaluated and was found to be a well designed and easily adaptable instrument for the laboratory which requires a general purpose semi-automated microflow-through Spectrophotometer. Long-term drift, precision, linearity and adaptability were quite acceptable, but although the instrument accepts micro quantities of liquid producing reasonably precise measurements, it was found that carry-over can be quite significant at lower volumes.

During the study a problem was encountered with kinetic alanine—and aspartate aminotransferase assays which is probably due to initial deposition of NADH onto the cell wall or pump tubing.

Introduction

During September and October, 1981 the Shimadzu™ CL-720 Micro-flow Spectrophotometer was evaluated for long-term drift, linearity, carry-over, imprecision and flexibility within the clinical biochemistry department.

The instrument consists of a spectrophotometer, peristaltic pump-unit, printer and micro-processor, all housed together in one unit. It can be utilised for either end-point or a range of kinetic techniques within a wavelength range of 330 nm to 900 nm. Specifications of the instrument are as follows:

SPECIFICATION

Wavelength Range: 330 to 900 nm. Light Source: Tungsten Lamp. Band Width: Grating 120 lines/mm. Gillieson mounting. Wavelength Accuracy: 1.5 nm. Stray Light: Less than 0.1% at 340 nm. Flow Cell: Stainless steel. Optical path length of 10 mm. Cell volume of 33 µl. Cell is housed in an overhung cell compartment with minimal sample inlet path. Removable cartridge type. Temperature Setting: 25°, 30° and 37°C. Controlled to ± 0.1°C by built-in thermo-electric temperature controller. Min. Sample Intake: 300 µl. Measuring System: Double-beam photometry.

Solution intake is by means of the peristaltic suction pump whose volume is programmed via the micro-processor in the range of 0 to 9.9 ml. Automatic air-purging between samples and continuous measurements modes can also be programmed via the micro-processor.

The micro-processor, via the numeric key-board and individual keys, controls the following modes and functions:

BASIC MODES: 1. ABS mode: 0 to ± 1.999 A. 2. CONC mode: ABS value multiplied by factor of 0.001 to 9999. 3. RATE mode: ABS is measured to nearest 0.1 mABS unit and activity value is calculated. Initial absorbance is printed and linearity is checked. 4. EIA mode: ABS changed for 30 sec. multiplied by factor is calculated and printed.

ADDITIONAL MODES:

1. Repeated printing of absorbance values at selected interval. 2. Repeated measurements in kinetic mode. 3. On/off air-purging between samples. 4. Difference measuring mode. 5. Two programmable channels for linearizer (by 5 section approximation). 6. Control mode for storing of parameters of linearizer constants into the battery powered RAM. Up to 18 user selectable tests can be programmed into RAM utilising the following parameters: (a) Items: alpbabetical up to 4 letters. (b) Basic modes: ABS, CONC, RATE or EIA. (c) Factor value: 0.000 to 9999. (d) Sample volume: 0 to 9.9 ml. (e) Lag time: 0 to 999 sec. (f) Rate time: 1 to 999 sec. (g) On/off for air-purging, repeat measurement and linearizer.

Date output is to the inbuild 20 digit thermal printer. General information regarding the instrument in New Zealand is summarized in Table I.

Methods and Results

MINIMUM VOLUME OF LIQUID REQUIRED FOR MEASUREMENT

A solution with an absorbance of approximately 1.0A at 600 nm was used to determine the minimum sample volume required for precise measurement. The sample intake volume was decreased from 1.0 ml by 0.05 ml steps until no more reproducible results were obtainable. Although only one digit after the decimal point is displayed when entering the fill volume, the micro-processor does allow for and sets the fill volume to two decimal places. The minimum fill volume required for precise measurement was found to be 0.45 ml. However this entered volume actually aspirated 0.37 ml of solution.

PHOTOMETRIC LONG-TERM DRIFT

A solution with an absorbance of approximately 2.0A at 600 nm was aspirated into the flowcell and readings were taken at 5 minute intervals for one hour. The absorbance readings ranged from 1.981 to 1.988 with a mean of 1.985.

LINEARITY

A series of 12 dilutions ranging from 1:1 to 1:10 were made from the previous solution and three readings were taken of each dilution. The mean of each dilution was plotted against the dilution ratio and the resulting graph showed that the instrument was linear over the photometric range of the instrument.

CARRY-OVER

Carry-over was determined utilising two solutions:
Solution A with an absorbance of ± 2.0Å, and
Solution B with an absorbance of ± 0.2Å at 600 nm.

Three successive reading were taken of Solution A followed by three successive reading of Solution B with the actual fill volume set at 1.0 ml initially and then repeated with an actual fill volume of 0.4 ml. The tests were then repeated at those two fill volumes with the automatic air-purge between samples in the on mode. The formula of Young and Gochman was used to calculate the percentage interaction[1].

$$\% I = 100 \times \frac{(B1 - B3)}{(A3 - B3)}$$

The results are shown in Table 2.

IMPRECISION

Eleven solutions with absorbances ranging from 0.18 to 1.96A at 600 nm were measured at random with an actual fill volume of 1.0 ml and with air-purging on, until 13 readings were obtained for each solution. Table 3 shows the mean, coefficient of variation and range of values measured of the eleven solutions and we consider the instrument precision to be acceptable.

WAVELENGTH CALIBRATION CHECK

The Oxford™ Spectro-check kit was used twice a week during the evaluation period as per the manufacturer's instructions. Results obtained during the evaluation were precise and acceptable.

INSTRUMENT WARM-UP AND CELL TEMPERATURE CHANGE-OVER TIMES

A solution with a known absorbance was aspirated into the flowcell after the instrument had been turned off overnight. It took slightly less than five minutes on two consecutive days before the correct reading was obtained and stable.

After the instrument had been in operation for at least four hours, distilled water was aspirated into the flowcell and recordings were made of how long it took to reach temperature stability from 37° to 25°C and vice versa. This test was repeated five times and the results were: from 37° to 25° took an average of 50 seconds and from 25° to 37° took an average of 30 seconds It was also determined how long it took for a solution at room temperature to reach temperature stability at 37° when aspirated into the flowcell. After five times the average time take was 12 seconds.

Discussion

The Shimadzu CL-720 proved to be a well designed, easy to use and technically acceptable instrument. Although volumes as low as 0.37 ml could be precisely measured, our results show that carry-over can be quite significant at lower volume intakes and laboratories should determine for themselves what volume intakes produce acceptable percentage interaction between samples for their particular tests.

Table 1. General Information

Name of Instrument	Shimadzu Micro-Flow Model CL-720 Spectrophotometer.
Manufacturer	Shimadzu Corporation, Japan.
N.Z. Distributor	Sci-Med (N.Z.) Ltd.
Dimensions	36 × 47 × 40 cm. (W × D × H)
Accessories	Laboratory recorder. $N.Z. : 1,660 Automatic sample changer. $N.Z. : 3,240 Cartridge-type sample compartment for 10 mm square cell. $N.Z. : 169
Service Back-up	At Dunedin, Christchurch, Palmerston North and Auckland.
Price	$N.Z. : 10,600 (As at November, 1981)
Warranty	18 months against defects in workmanship and/or materials.
Documentation	User and service manuals provided.

Table 2

Solution	Air Purge On		Air Purge Off	
	1.0 ml	0.4 ml	1.0 ml	0.4 ml
A1	1.960	1.656	1.944	1.756
A2	1.989	1.954	1.974	1.930
A3	1.990	1.986	1.978	1.962
B1	0.200	0.419	0.169	0.639
B2	0.175	0.174	0.155	0.220
B3	0.174	0.167	0.154	0.173
%I	1.4	14	0.8	26

During the period of evaluation all of our biochemistry routine methods were transferred to the instrument without any problem. The ability to enter and/or change the various test parameters and instrument settings have made this instrument extremely easy and versatile to use even for non-departmetal staff when on night call.

During the study a recurring problem with aspartate and alanine aminotransferase assays was encountered. The first sample of either test, which generally was a known quality control sample, was usually about 100 units too high and showed non-linearity. A subsequent repeat of the same sample generally then produced the expected acceptable result. No such problem was encountered with any of our other enzyme assays, these all being Calbiochem™ SVR reagents, nm., LDH, CPK and Alkaline Phosphatase. If the reagent alone is first aspirated a result of about 100 units generally results and when followed by a known quality control sample this would produce the expected value. As the only substance common to the aminotransferase assays and not to the other enzyme test reagents is NADH, it is assumed that NADH is being absorbed on to the cell wall or pumptubing when the reagent is first introduced into the system. This problem was not encountered with the Calbiochem™ SVR Urea reagent which also contains NADH in the same concentration as the aminotransferase reagents, but utilises a different buffer system. Studies are now in progress to determine the effects of different buffer systems on NADH with the instrument.

Acknowledgements

The authors wish to thank Sci-Med (N.Z) Ltd for the loan of the instrument during the evaluation period, and to Nancy Warner for typing the manuscript.

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Table 3

Mean	1.947	1.764	1.558	1.457	1.276	0.955	0.755	0.621	0.462	0.367	0.188
C.V. %	0.45	0.56	0.83	1.15	0.86	1.47	1.45	2.58	2.77	4.36	6.50
Range	1.928-1.958	1.754-1.780	1.534-1.577	1.427-1.479	1.262-1.293	0.930-0.972	0.736-0.767	0.598-0.641	0.440-0.480	0.344-0.389	0.168-0.207

Hereditary Antithrombin III Deficiency in Pregnancy

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Received for publication 6 October 1981

Abstract

The management of pregnant women deficient in Antithrombin III presents a major problem, because treatment usually involves the use of Vitamin K antagonists (Warfarin) which may endanger the foetus. When such a patient presented to our laboratory, we decided to monitor the antithrombin III levels during the pregnancy.

It was found that the antithrombin III level did not change significantly throughout the pregnancy, or post-partum, apart from a drop immediately after delivery. Warfarin given post-partum was also associated with no changes.

Key Words
Hereditary Antithrombin III Deficiency, pregnancy, thrombosis, Warfarin.

Introduction

Antithrombin III (AT III) is one of the main inhibitors of the blood coagulation system.[1] It helps maintain haemostasis by neutralising a number of the activated clotting factors including thrombin, Factor XIIa, XIa, IXa, Xa, Kallikrein and plasmin. AT III essentially reacts with thrombin. It progressively inhibits thrombin and the reaction is accelerated by heparin. An inactive thrombin-antithrombin complex is formed between the arginine site of AT III and the active serine site of thrombin. Heparin is attached to the lysine site of AT III and its fixation probably induces a modification of the confirmation of AT III which makes the arginine site most accessible to thrombin.

Hereditary AT III deficiency has an autosomal dominant mode of inheritance. Patients with this condition have an increased susceptibility to thrombosis particularly in situations such as pregnancy, women taking oral contraceptives and surgery. The condition was first described by Egeberg in 1965[2] and an increasing number of families have been reported in the literature since then.[3, 4, 5, 6]

Our patient a twenty-two year old woman, was first brought to our attention in 1978 when she developed a pulmonary embolism four months after the birth of her first child. Tests performed on her and her relatives confirmed a diagnosis of Hereditary AT III deficiency. Many members of her family had reduced AT III levels

with a history of thrombotic episodes. Further details of this family will be published at a later date.

When the patient presented in 1980 during her second pregnancy the available information on the AT III levels during pregnancy in women deficient in AT III and the effect of anticoagulants was limited.

One paper suggested the AT III level would drop further[7], another said it would remain the same[8] and methods of treatment with Warfarin and Heparin were suggested[9]. It was decided to monitor the AT III level throughout the pregnancy and to give subcutaneous heparin if any clinical signs of D.V.T. occurred or it the AT III level dropped.

Method

Venous blood was obtained using 0.5 ml of 0.105 M buffered citrate solution to which was added 4.5 ml of blood. Specimens were centrifuged at 2500g for 10 minutes in a refrigerated centrifuge. Plasma was separated into plastic tubes and stored at −80°C until tested.

AT III levels were measured using Ortho* Antithrombin III assay. This is a two stage clotting assay for the quantitation of functional AT III in defibrinated plasma. The method was performed as outlined in the manufacturer's instructions. The normal range is quoted to be 80-120 percent in the manufacturer's instructions. AT III antigen was measured by Laurell Rocket immuno-electrophoresis technique.

Results

As can be seen from Figure I the patient's AT III level did not change significantly throughout the pregnancy. The patient delivered at 0300 hours on 19.11.80 and was stared on subcutaneous heparin (5000 IU 8 hourly) at 1400 hours on 19.11.80 and this was continued for seven days. Warfarin was commenced 1800 hours 19.11.80 and continued for 2 months and tailed off. Prothrombin times were maintained at a prothrombin ratio of 2.0-4.0 using Wellington Hospital Thromboplastin which is standardised against Australasian Reference Thromboplastin.

There was a significant drop in the patient's AT III level soon after delivery before heparin was administered.

No problems occurred and there were no clinical signs of a D.V.T. The patient is now well.

Discussion

This patient brings up some interesting points on Antithrombin III deficiency.

A recent paper by Weiner[8] found no change in AT III level in normal women during pregnancy. We also found that there was no change in the AT III level of this patient with hereditary AT III deficiency during pregnancy. The drop in AT III level immediately after delivery is difficult to explain. As Weiner[8] found no drop in AT III levels in normal women after delivery, but did mention that studies in progress indicate a decrease in AT III activity does occur in certain abnormal pregnancies. Does this include women with AT III deficiency or is this the normal post-operative drop as mentioned by Brozovic[10]?

The pregnant AT III deficient patient presents problems as Warfarin cannot be administered as this may endanger the foetus[3].

Subcutaneous heparin would be the method of choice[9] but as one paper suggested heparin may cause a further decrease of AT III level[11] thus the AT III level would need to be monitored. In this case no drop in AT III level was observed while the patient was on heparin.

Sas[4] has classified the deficiency on the basis of a quantitative or qualitative defect.

1. Quantitative defect (Type 1) in which the functional and immunochemical measurement of AT III are similar.
2. Qualitative defect (Type II) in which the functional and immunochemical measurements are different.

The patients AT III level when measured by Laurell Rocket electrophoresis showed that it was not decreased although at the lower end of the normal range. Thus it would appear that the deficiency in this case is Type II but further work is being done to clarify this.

The administration of Warfarin seems to reduce the chances of thrombosis although no change occurs in the AT III level[12].

Should all patients with hereditary AT III deficiency be on continuous Warfarin? It would appear that there is no benefit from this treatment in most cases. These patients must be adequately covered whilst undergoing surgery or covered both during, or after pregnancy[6].

Present treatment could be with fresh frozen plasma[9] to supply supplementary AT III during labour and pregnancy. Treatment in the future may include the use of AT III concentrates in severe cases[13]. Stanazolol treatment (an anabolic steroid) raises the AT III level and might be useful when coumarin compounds are contra-indicated[14].

Several cases of symptomatic thrombosis have been reported as having hypertryglyceridaemia in addition to an AT III deficiency. As yet this has not been demonstrated in our patient.

This is the second case of hereditary AT III deficiency we have found in our laboratory, both cases have major thrombotic problems in affected relatives, stressing to us the importance of performing AT III levels on all patients with recurrent thrombotic problems.

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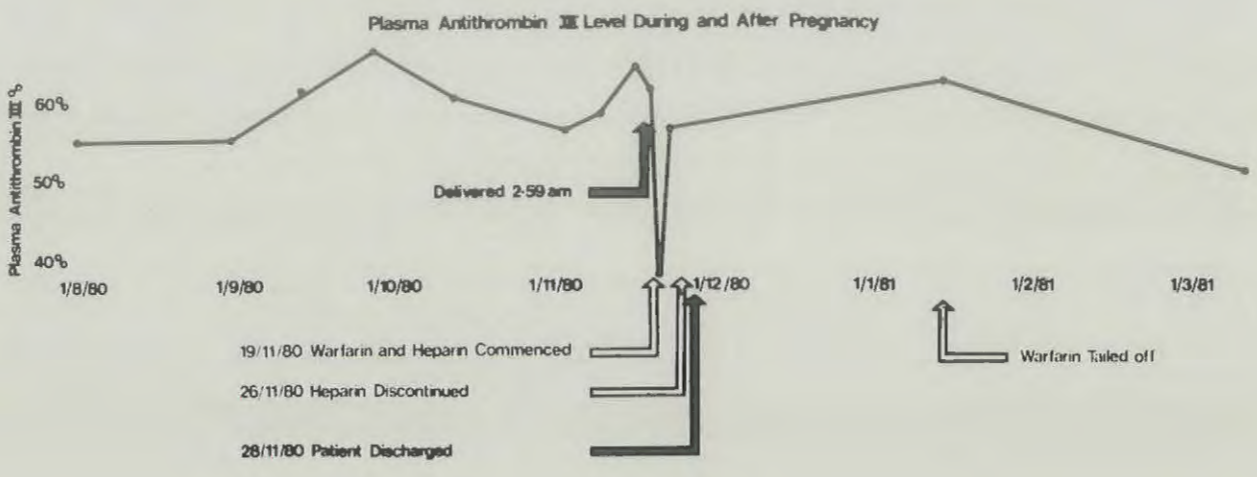

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Methyl/n-Butyl Methacrylate as an Embedding Medium for Routine Resin Sectioning in Light Microscopy

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Received for publication February 1982

Abstract
A modification of Phillpotts' method[1] for methyl/n-butyl methacrylate embedding of renal biopsies is applied to large blocks of tissue. Semi-thin sections are produced without some of the polymerisation and staining problems encountered with the more popular glycol methacrylate methods.

Keywords
Resin section, Methacrylate, Light microscopy.

Introduction
The most popular medium for plastic embedding in light microscopy is glycol methacrylate.[2] Nevertheless problems often arise in producing the right conditions for polymerisation, sections are difficult to stain and the resins are cumbersome to prepare and do not last long in storage.

Philpotts' methyl/n-butyl methacrylate method for renal biopsies[1] has been modified for the preparation of semi-thin sections from blocks up to 1.5 × 1.3 × 0.5 cm using the Sorvall resin embedding system.[3] Polymerisation is easily achieved, the resin is removed from the sections facilitating more familiar staining techniques (Fig. 1), and the simply prepared pre-polymerised resins may he stored for several weeks.

Method

FIXATION AND PROCESSING

Tissue blocks are fixed in 10% neutral buffered formol saline and dehydrated through graded alcohols, the times being determined as they are in paraffin processing by the thickness and nature of the block. Tissues are then impregnated with a mixture containing equal parts absolute ethanol and methacrylate solution followed by two changes of methacrylate and finally immersion in pre-polymerised methacrylate. These stages should be of equal time which varies from 15 min for a needle biopsy up to 2 h for larger blocks.

Processing through methacrylate solutions should be carried out in a fume cabinet using disposable glass containers. Rubber gloves should be worn.

EMBEDDING

Blocks are embedded in fresh pre-polymerised methacrylate and polymerisation is completed by incubation overnight at 60°C.

PREPARATION OF METHACRYLATE SOLUTION:

n-butyl methacrylate	90 cm³
Methyl methacrylate	10 cm³
2-4 dichlorobenzoyl peroxide (DBP)	2.1 gm

The resins are measured into a 100 cm³ stoppered measuring cylinder and the DBP added and dissolved by inverting the cylinder. A fews grams of anhydrous calcium chloride are added to remove any globules of water. The solution is filtered and may be stored at 4°C for several weeks.

PRE-POLYMERISED METHACRYLATE

A quantity of the methacrylate is placed in a small disposable glass screw top jar. The jar is now heated in an 80°C waterbath, agitating continuously, until the resin has a consistency similar to that of glycerol; this usually takes between 10 to 15 min. The solution is now cooled and stored at 4°C.

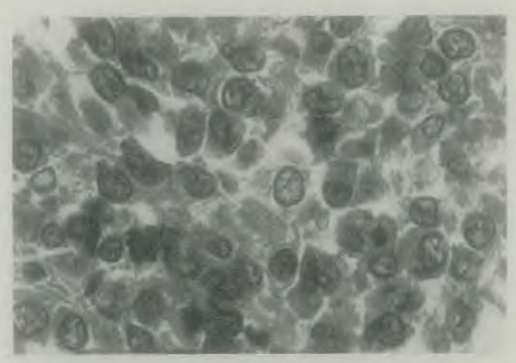

Fig. 1. Haematoxylin and Eosin Stain.

Fig. 2. Microtome and glass knife adapter.

SECTION CUTTING

Sections were cut at 0.5-2 μm on a Sorvall JB4 microtome.[3] Ralph knives were used mounted in a LKB glass knife adapter type LKB2078.[4] A small knife profile and clearance angle of 3° gave the best results (Fig. 2). Sections are taken from the glass knife with fine watchmaker's forceps and placed directly onto a drop of water on a clean glass microscope slide. The section is flattened by placing the slide on a hot plate at about 60°C. Final drying is carried out by incubation for 1 h at 60°C.

STAINING

The resin is removed from the sections by immersion in chloroform in a Coplin jar for 1 h at room temperature. The sections are rinsed in alcohol, then in distilled water and stained in the usual manner.

Conclusions

The value of semi-thin resin sections is well accepted.[2] This resin mixture has been applied to a wide variety of tissues with little variation in cutting properties. Usually by increasing the staining times most common demonstration techniques have been accomplished (e.g. haematoxylin and eosin, periodic acid-Schiff reaction, Gomori's periodic acid methenamine-silver technique, Weigert's haematoxylin and van Gieson's counterstain). Overall it provides a very satisfactory routine technique.

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A Technique for the Demonstration of Kinetochores (Cd-bands) in Human Chromosomes

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Received March 1982

Abstract

A methodology for demonstrating the kinetochores in human chromosomes is described. The chromosomes are immersed in a solution of Earle's salts pH 8.8 for 10-45 minutes at 85°C and subsequently stained in Giemsa or Leishman stain. The results and technique are discussed.

Key words

Centromere, human chromosome, kinetochore, primary constriction.

Introduction

Chromosome indentification prior to the banding era was largely based on four criteria: (1) the overall size of the chromosome, (2) the presence or absence of secondary constrictions and satellites, (3) the apparent position of the centromere or primary constriction (metacentric, submetacentric or acrocentric) and (4) to a lesser degree, autoradiographic studies (Fig. 1). Light microscopists mostly refer to the primary constriction of the chromosome as the centromere or kinetochore, which contrasts with the electron microscopists who use the term kinetochore in relationship to the dot-like body found within the centromere region, which has direct association with the spindle microtubules by which chromosomes are moved during cell division (For a review see Stack, 1974[1]).

When C-banding techniques are applied to chromosomes they have been shown to stain successfully the centromeric regions of the chromosome. This chromatin which stains positively has been termed centromeric constitutive heterochromatin. These large masses of centromeric heterochromatin, which are particularly evident in human chromosomes, obscure the kinetochores and, therefore, further denaturation or extraction is required of that chromatin before the kinetochores or Cd-bands can be clearly identified. The technique used in this laboratory is based on the method of Eiberg (1974)[2].

Materials and Methods

METHOD FOR CD-BANDS (CENTROMERIC DOTS)

SOLUTIONS AND REAGENTS

(1) Earle's BSS adjusted to pH 8.8. (2) Deionized glass-distilled (1) H_2O. (3) Giemsa R66. 5 ml of Giemsa R66 made to up 20 ml with pH 6.8 Sőrenson's phospate buffer. (4) Leishman stain. 5 ml of Leishman stain made up to 20 ml with pH 6.8 Sorenson's phosphate buffer.

MATERIALS

Water-bath at 85°C. Coplin jars.

PROCEDURE

1. Chromosomes are harvested in the normal way, except that cells are fixed first of all in 9:1 methanol/acetic acid for 20 minutes, followed by centrifugation and a further two changes of fixative 5:1 and 3:1 in methanol/acetic acid, respectively.

The cells are spread by the drop technique and allowed to air-dry at room temperature for 9 days.

2. Slides are immersed in a Coplin jar containing Earle's salts, which have been previously warmed to a temperature of 85°C, and examined periodically from 10-45 minutes from time of incubation.
3. After removal from hot Earle's salts, slides are rinsed 3 times in dist. H_2O and once in pH 6.8 Sorenson's phosphate buffer.
4. The slides are then stained for 15-30 minutes with either Giemsa or Leishman stain, rinsed rapidly in pH 6.8 Sorenson's phosphate buffer and blotted dry.

NOTES ON PROCEDURE

1. For consistent control of denaturation, water-bath temperature needs to be at a constant 85°C.
2. Staining times in Leishman or Giemsa will vary from batch to batch of stain.

Results and Discussion

Metaphases which begin to denature first will be those with less spiralisation producing clearly defined Cd-bands after only 10 minutes' treatment. Cells in early metaphase which show no chromatid separation will not show definite Cd-bands until 25 minutes after onset of treatment in the hot salt solution. With sequential removal of slides from the salt solution, it can be observed that C-band regions of the C-group chromosomes 17, 18, 2, 3, 4, 5, 19 and 20 fade first, to be followed by 16qh, 9qh and 1 qh regions. The D-group of chromosomes are seemingly inconsistent, some not giving evidence of denaturation at the C-band region until after the 1 qh.

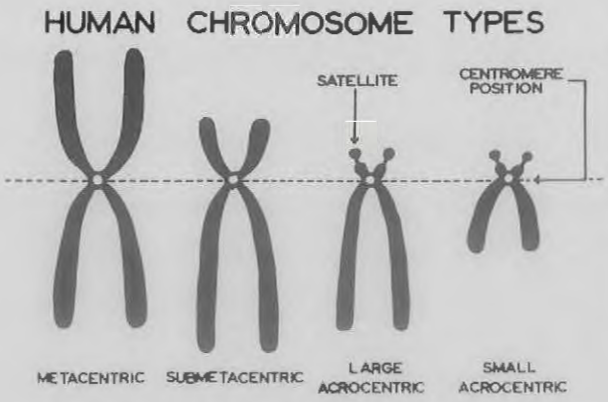

Fig. 1. Diagrammatic representation of human chromosome types.

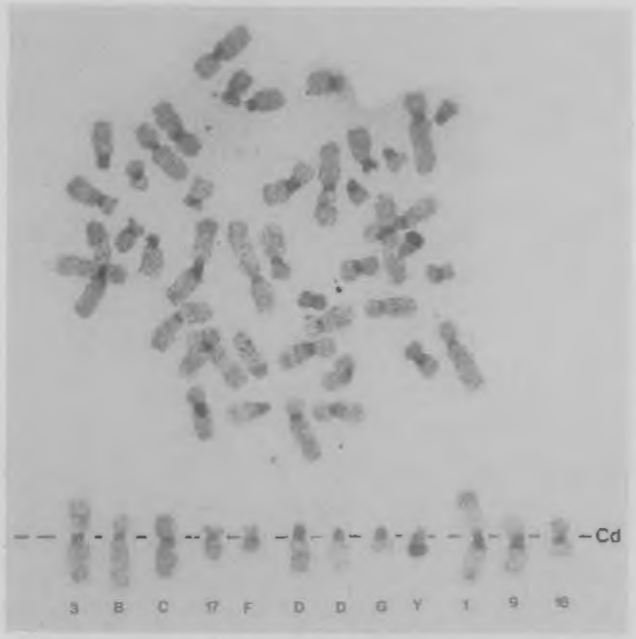

Fig. 2. Cell showing incomplete denaturation.

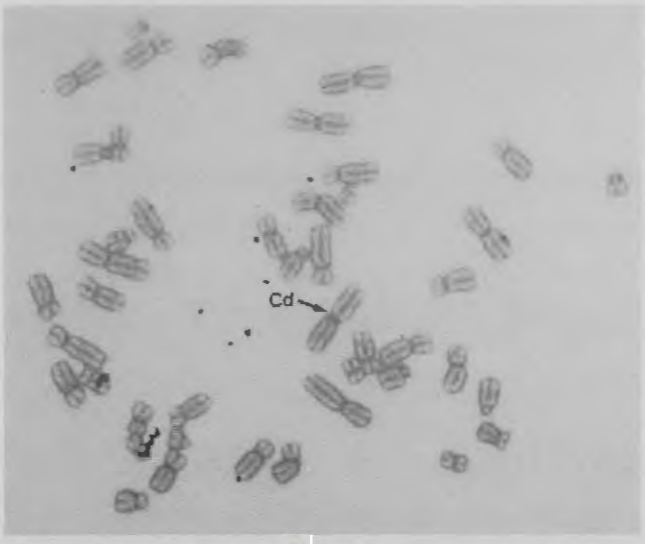

Fig. 3. Metaphase showing Cd-bands (kinetochores)

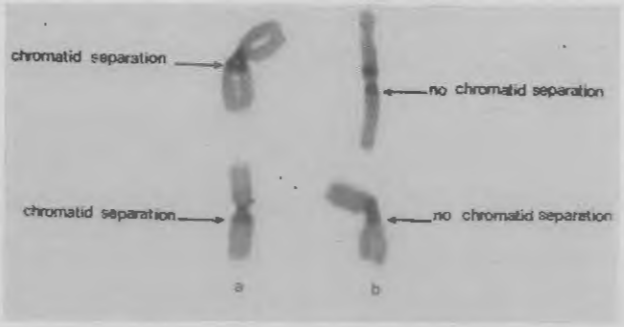

Fig. 4a. Chromatid separation at one of the centromeric regions in a dicentric chromosome (suppressed centromere).

Fig. 4b. Same dicentric showing no chromatid separation at either centromere.

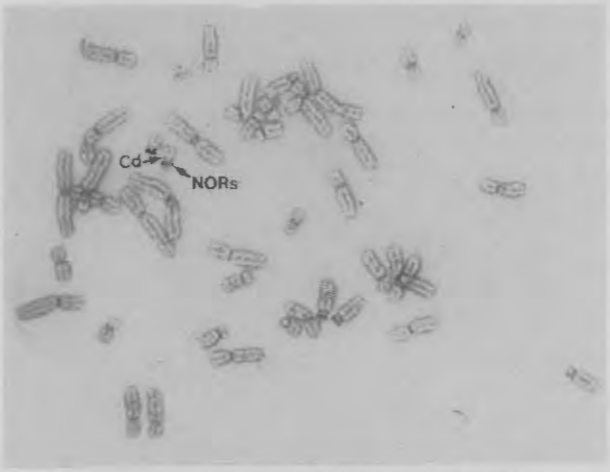

Fig. 5. Metaphase showing active NORs and Cd-bands.

Figure 2 shows incomplete denaturation of centromeric constitutive heterochromatin, further treatment being needed to demonstrate only the Cd-bands (Fig. 3). As far as the technique allows, the Cd-bands are equal in size and represent the kinetochores.

On occasions, in humans, dicentric (two centromeres) chromosomes have occurred due to the formation of ring and isochromosomes or else translocations.[3] It has been suggested that the stability of these dicentric chromosomes may be due to the closeness of their centromeres and the suppression at times of one or the other of them. Centromeric suppression is thought to be expressed by chromatid separation at one of the centromeric regions (Fig. 4a). When Cd-banding has been applied to dicentrics with chromatid separation at the centromere,[4, 5, 6] the Cd-bands were absent. Likewise, in a recent study by Romain *et al.*[7] on a dicentric homologous Robertsonian $^{13}/13$ translocation, the Cd-bands were seen to be absent in the suppressed centromere whether or not there was chromatid separation at the centromere (Fig. 4b).

The interesting observations of dual centromeric activity or suppression of one centromere occurring in dicentrics is no doubt open for further research and discussion.

The technique previously described will, on occasions, show staining of active nucleolar organiser regions (NORs), but these cannot be confused with the centromeric dots as they are not uniform in size and, of course, are present only on the acrocentric chromosomes in the normal human genome (Fig. 5).

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THE MANAGEMENT OF THE LABORATORY

Predictors of N.Z.C.S. Success

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Introduction

Medical Laboratory Technology is a five year course of study culminating in the Certificate of Proficiency in Medical Laboratory Technology. Applicants to the course are required to have University Entrance with passes in Chemistry, Biology and English as essential prerequisites. There are a large number of applicants (in Dunedin about 45 for 4 positions) so competition is stiff and those selected frequently have a seventh form year and sometimes Bursary. Because the majority of applicants have been accredited the basis for comparison is School Certificate marks and their academic record for the final year at school.

During the first three years trainees from small centres attend three-month block courses each year at the Central Institute of Technology in Heretaunga, those from large centres (Wellington, Hamilton and Auckland) attend their local polytechnic. Despite the good academic records of those selected the failure rate is high, and in 1979 out of 104 NZCS candidates seeking the Basic Training Certificate only 59 passed outright, 29 failed and 19 had not completed fully all other commitments to be granted the New Zealand Certificate of Science (NZIMLT Newsletter, May 1980). Figures for 1980 were improved with 65 passes (including 9 conceded passes), 16 failures and two trailing English (NZIMLT Newsletter, May 1981).

Prior to 1970 the first three years' study culminated in a multidisciplinary examination termed the Intermediate. NZCS (Paramedical) was introduced in 1970 to replace the Intermediate which was phased out in 1974. I was only able to locate pass/fail rates for 1966 when 19 candidates sat the Intermediate examination and only one failed indicating either that the methods of teaching have deteriorated or that the course is academically more difficult now. Tutoring for the Intermediate examination was all carried out in the candidate's home laboratory by qualified staff.

The purpose of this paper was to compare those who passed with those who failed in an attempt to define any differences which might have had a bearing on the failure rate.

Abbreviations

AC—Accredited. Biochem—Biochemistry. BTC—Basic Training Certificate. CIT—Central Institute of Technology. CT—Charge Technologist. COP—Certificate of Proficiency. GO—Graded Officer. Haem—Haematology. Immuno—Immunohaematology. Micro—Microbiology. NZCS—New Zealand Certificate of Science. NZIMLT—New Zealand Institute of Medical Laboratory Technology. S. Cert—School Certificate. SO—Scientific Officer. ST—Staff Technologist. U.E.—University Entrance.

Survey Scope and Method:

This questionnaire was designed to investigate both the initial attributes of candidates and their mode of training, keeping in mind the many facets which have a bearing on whether trainees will be successful or not. The first part of the questionnaire defines those selection critieria which would have been available to employers to see if there is any correlation with future examination success. If those factors which identify successful incumbents could be defined the high rate of wastage could be reduced.

The second part of the questionnaire examines the type of laboratory and the degree of in-service assistance (additional to Polytechnic) given to candidates to see what effect these factors have on the pass rate. The final section was only for those who had failed a subject in 1980, to examine why they felt they failed and the subsequent amount of assistance given to them. Students who fail are not normally granted release from work to attend a repeat block course so are very much on their own.

The questionnaire was distributed by mail in October 1981 to all BTC candidates who were completing their Year Five NZCS requirements in 1980. A reply paid envelope was enclosed and six weeks later a follow up letter was sent to those who had not responded (Appendix A and B). After February 1, 1982, a final cutoff was applied and the results analysed. The mailing list was obtained from the Medical Technologists' Board.

A small pilot study was first undertaken with a representative group of trainees to determine whether the questions would elicit the information that was needed and to bring to light any ambiguities. From this and following discussion the final question format for the present study was arrived at. Included with the questionnaire was a letter from the researcher explaining the nature and purpose of the study and stressing that all replies would remain anonymous.

Previous Related Research:

The prediction of academic success on the basis of such factors as age, sex and previous examination results has been the subject of a number of studies. Anderson (1965)[2] found that of the many possible predictors of academic performance the best is the school examination result (i.e. the composite mark). The combination of examination marks with data from other sources rarely improved the correlation. Choppin (1973)[3] in examining the English system found that for most courses at University the best predictors of first year performance were GCE A level grades and also that the predictive contribution of O levels and school assessment was greater than had been supposed. Lawrence (1970)[7] stated that a correlation of between 0.5 and 0.6 can be expected between predictor and criterion measures in unversity performance. Firth

(1970)[4] on the other hand reported a correlation of only 0.38 between high school aggregate marks and first year medical school examination results.

Parkyn (1967)[10] found that there are apparently inexplicable failures even among the best prepared students, as well as passes among those who would be considered poor risks at entry. He also found predictions could not be improved by taking into account performance in specific subjects at the entrance level. Small (1966)[11] in an intensive study of 99 first year students found that successful students had careers that were more conventional (that is, fewer of them had failed, fewer had had breaks in study, more of them had had a seventh form year).

Harris (1940)[5] in a review of the literature relating to factors affecting college grades concluded that it had been shown that the essential factors involved in student achievement were, in order of importance

1. Ability (intelligence, scholastic aptitude)
2. Effort (drive, degree of motivation)
3. Circumstances (personal, social, economic, etc.)

The ability of applicants as shown by their previous academic record can be assessed with some degree of reliability, their drive is often an unknown factor, and their circumstances as known at the time of selection may alter with time. Predictive validity is concerned with the extent to which selection criteria predict future performance and the purpose of this project is to determine whether the selection criteria presently employed for NZCS candidates are valid.

NZCS as a form of tertiary education closely relates to University study and the candidates involved have in many cases similar qualifications. The stringent selection process, excluding as it does the majority of the applicants, should result in a high pass rate for NZCS candidates. Anderson (1965)[2] found that rejecting 30% of suitably qualified applicants would achieve a 10% increase in the student pass rate from around 70% to 80%.

However academic success is a complex and multifaceted goal dependent on a large number of variables, some of which cannot be quantitated in concrete terms. Allison (1977)[1] found that the relationships between emotional states and academic performances were not simple and both are related in a complex manner to intellectual ability. Thus for example while high levels of anxiety may impair academic performance in some students, anxiety may facilitate performance in others. This confirmed the earlier work of Spielberger (1962)[12] who found that students of low ability fail regardless, students in the middle range of ability generally perform inadequately in anxiety states but students of high ability may actually improve their performance.

Defining Failure:

For the purposes of this survey it was decided to define failure as those candidates who received a D or E grade for any of the four subjects of the final year (year five) of the NZCS paramedical examinations. Those receiving conceded passes (45-49% with passes in all other subjects) were also classified as failures as these results would not have stood alone as a single subject. The stated policy of the Medical Technologists' Board is that it will not necessarily accept a concession pass in a subject for the award of the BTC and will probably give an oral examination to candidates who obtain such a pass in the subject concerned. NZCS candidates who were not sitting for recognition for award of the BTC were omitted from the survey. Interestingly this latter group had a far higher failure rate, indicating that our selection criteria could be worse (see Table 1).

Table 1: Breakdown of 1980 NZCS examination results

	Pass	Conceded Pass	Fail	Total	Pass Rate
BTC Candidates	56	9	16	81	69%
Non-BTC Candidates	6		14	20	30%

A breakdown of BTC candidates' examination results by subject showed that the pass rate was not appreciably worse for any one written subject (see Table 2).

Table 2: Breakdown of 1980 NZCS-BTC examination results by subject

Subject	Pass	Conceded Pass	Fail	Total	Pass Rate
Immuno/Haem	68	4	8	80	85%
Micro	73	1	6	80	91%
Biochem	65	3	9	77	84%
Practical	77		1	78	99%

Results

RESPONSE

From the 84 NZCS candidates contacted 63 usable questionnaires were returned. Another 3 were confirmed as having either left the country or resigned from the job. There were only 18 people who did not return their questionnaire and whose reason for non-response is unknown (Figure 1). The return rate of 79% is reasonably high for a postal survey, particularly considering that the questionnaire was being distributed a full year after the event and a proportion of staff always choose to move on after completing NZCS.

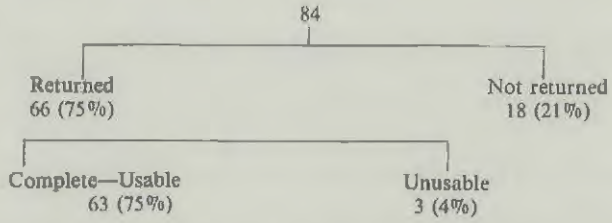

Figure 1: Response rate of NZCS-BTC candidates

To draw valid conclusions from the questionnaires returned it is necessary to have a high response rate and a representative sample. Information on those who did not reply is limited but on the basis of districts it is possible to show that those who did not reply were randomly distributed throughout the country (see Table 3). The 100% return from the Dunedin area was due to it being the researcher's home district, enabling personal followup.

Table 3: Response rate by district

District	Reply	Non-reply	Total	% Reply
Auckland/Whangarei	24	9	33	73
Hamilton	5	2	7	71
Wellington/Hutt	7	2	9	78
Christchurch	4	2	6	66
Dunedin	5	Nil	5	100
Others (< 5/district)	19	4	23	82

The high response rate could be attributed partly to the followup letter (which elicited 10 replies) and partly to the candidates' interest and concern with the subject matter. The sample studied provides a representative picture of the total population.

SEX OF CANDIDATES:

Sixty-one females (73%) and 23 males formed the total population surveyed, 46 females (73%) and 17 males responded, confirming the random distribution of those who did not respond. A breakdown of the pass rate by sex showed no statistically significant difference (Table 4).

Table 4: Pass rates of NZCS-BTC candidates by sex

Sex	Pass	Fail	Total	Pass Rate
Male	11	6	17	65%
Female	32	14	46	70%

PRE-TRAINING ACTIVITIES:

Although the majority of trainees (65%) begin their training directly from school a significant number had worked or studied in some other field in the intervening period. Table 5 gives a breakdown of the pre-training activities of candidates.

Table 5: Pre-training activities of NZCS-BTC candidates

Activity	Pass	Fail	Total	Pass rate
Nil (direct from school)	27	12	39	69%
University studies	4	0	4	100%
Polytechnic	3	2	5	60%
Laboratory Assistant	5	4	9	56%
Labouring	1	0	1	too few
Bank/Clerical	3	2	5	60%

With the exception of those who had a year at University and who had a 100% pass rate there appeared to be little difference between candidates coming from a variety of avenues. There seemed to be some grounds for preferring a school leaver over an older applicant, and ex-laboratory assistants—despite their familiarity with the work—made the poorest showing.

Of those candidates who had come directly from school 15 (41%) had done a seventh form year (see Table 6).

Table 6: Classification of school leavers

	Pass	Fail	Total	Pass rate
No 7th Form Year	17	8	25	68
7th Form Year—no Bursary	3	2	5	60
7th Form Year + Bursary	7	4	11	64

It appeared that those candidates who had attended a seventh form year, whether they had obtained a bursary or not, had no advantage over those candidates who entered training directly from the sixth form. This may be partly because those taken directly from the sixth form are the cream of the applicants whereas those taken from the seventh form have often missed out on the initial round of selections and returned to school to try again a year later. Human nature being what it is those applying for a second time are given preference. This is born out by the fact that seven of those who attended a seventh form year (47%) had applied for training on a previous occasion. Whether they have received a bursary or not is an unknown fact at the time of selection as results are not out.

AGE OF TRAINEES:

Ages on commencing training ranged from 17 to 24 and reflected whether the candidates had attended a seventh form year and time spent in other jobs or study before commencing training.

SELECTION CRITERIA (1): SCHOOL CERTIFICATE MARKS:

A lot of weight in selection is placed on School Certificate marks as accrediting gives no basis for comparison. Chi square tests were set up to test whether the pass rates were identical in two defined population groups. A 2 x 2 chi square was used first to compare those with School Certificate marks (5 subjects) more than and less than 320 (average 64) and then more and less than 350 (average 70). See Tables 7 and 8. Tables were also set up to look at those who had received more and less than 64 for Science and English. See Tables 9 and 10. The null hypothesis to be tested in each case is that the two groups are equally adept at passing NZCS.

The chi square value was calculated by the following formula[1]:

	Fail	Pass	Total
Group A	a	c	g
Group B	b	d	h
Total	e	f	n

$$\text{Chi Square} = \frac{(1ad - bc1 - n/2)^2 \cdot n}{e.f.g.h}$$

Table 7: Comparison of School Certificate marks (5 subjects)

	Fail	Pass	Total
S. Cert. <320	9	4	13
S. Cert. ⩾320	10	36	46
Total	19	40	59

$$\text{Chi Square} = \frac{(1324 - 401 - 29.5)^2 \cdot 59}{19.40.13.46}$$

$$= 8.4$$

For 3 degrees of freedom $p \approx 0.04$

This result is statistically significant, those candidates with a total School Certificate mark over 5 subjects of more than 320 are more adept at pass NZCS Year Five.

Table 8: Comparison of School Certificate marks—5 subjects

	Fail	Pass	Total
S. Cert. <350	16	13	29
S. Cert. ⩾350	3	27	30
Total	13	40	59

$$\text{Chi Square} = \frac{(1432 - 391 - 29.5)^2 .59}{19.40.29.30}$$

$$= 11.8$$

For 3 degrees of freedom p = 0.008

This result is highly significant, those candidates with total School Certificate marks for 5 subjects of more than 350 have a very high probability of passing NZCS Year Five.

Table 9: Comparison of S. Cert. Science marks

	Fail	Pass	Total
Science <64	6	11	17
Science ⩾64	7	34	41
Total	13	45	58

$$\text{Chi Square} = \frac{(1204 - 771 - 29)^2 .58}{13.45.17.41}$$

$$= 1.4$$

For 3 degrees of freedom $p \approx 0.70$

Table 10: Comparison of S. Cert. English marks

	Fail	Pass	Total
English <64	8	8	16
Science ⩾64	8	34	42
Total	16	42	58

$$\text{Chi Square} = \frac{(1272 - 641 - 29)^2 .58}{16.42.16.42}$$

$$= 4.1$$

For degrees of freedom p = 0.25

Science and English were chosen for comparison because most candidates had passes in both subjects. The Chi Square tables showed that School Certificate Science marks could not be used as a predictor for future examination success and School Certificate English marks were of marginal significance.

SELECTION CRITERIA (2)—UNIVERSITY ENTRANCE PASSES:

Most of those entering training (94%) had UE accredited, only 4 having actually sat the examination. Those who had sat UE showed a very high pass rate indicating that they may have come from schools where accrediting is not carried out rather than them being failures from the system. Five candidates had taken two years to get accredited and they showed an unacceptably low pass rate (Table 11).

Table 11: Relationship of UE Pass

	Pass	Fail	Total	Pass Rate
UE accredited—1 year	38	16	54	70%
UE accredited—2 years	2	3	5	40%
UE sat	3	1	4	75%
All candidates	42	20	63	67%

Four candidates had overseas qualifications not directly comparable with University Entrance.

SELECTION CRITERIA 3—SIXTH FORM YEAR:

It is difficult to compare candidates on the basis of their sixth form year because of the lack of standardization between schools. Top of the class in one stream at one school may be the equivalent of middle of the class in another stream at a second school. Also being third in a class of 10 cannot be equated to being third in a class of 35. Nevertheless on the basis of their position in class in the final year at school it can be seen that those with a better record have more chance of passing NZCS Year 5 (Table 12).

Table 12: Comparison of final year class position.

Position in Class	Pass	Fail	Total	Pass Rate
Top 1/3	29	7	36	81%
Middle	12	11	23	52%
Bottom 1/3	—	1	1	Nil

INTRODUCTION TO MEDICAL LABORATORY TECHNOLOGY:

Most trainees' introduction to the job was through Vocational Guidance (see Table 13) and judging by the pass rate they are doing a commendable job of directing suitable candidates into training.

Table 13: Mode of introduction to MLT

	Pass	Fail	Total	Pass rate
Vocational Guidance	21	6	27	78%
Friend	11	8	19	58%
Family Member	5	2	7	71%
Newspaper Advert.	6	3	9	67%
Contacted Hospital	2	—	2	Too few

Those introduced to the job by a friend had the lowest pass rate indicating that selectors may have been biased in favour of applicants recommended or known to them personally and have given them preference over other better qualified applicants.

MODE OF SELECTION:

By far the majority of trainees (73%) were selected by a panel of interviewers (Table 14) and the pass rates indicate that this is the best selection method. Interviews are notoriously unreliable as a method of staff selection with the major problem lying not in the actual technique of interviewing but with the perceptions of the interviewer. By increasing the number of interviewers the reliability of the interview can be increased as a consensus of opinion becomes necessary.

Table 14: Mode of selection of trainees

Mode of Selection	Pass	Fail	Total	Pass Rate
Panel Interview	32	12	44	73%
Pathologist Only	5	3	8	63%
Charge Technologist Only	1	5	6	17%
Written Application Only	4	1	5	80%

It was interesting that those who were selected on the basis of a written application only proved so successful. Although the numbers involved are too small to be statistically significant it may indicate that it is easier to evaluate a candidate objectively on paper than it is faced with them in the flesh when all sorts of subjective judgements begin to be made.

CAREER PROSPECTS:

Sixteen candidates claimed they had no knowledge of the career structure when they commenced training and another 3 admitted to being unsure, leaving 41 (68%) who knew what the career structure was. Disturbingly fully one-third of the sample express their dissatisfaction with the career structure 3-4 years later. If this large a number have misgivings a little over half way through the course it is reasonable to suspect that an even larger number will be expressing dissatisfaction by the time they qualify—particularly in view of the reasons given (Table 15).

Table 15: Reasons given for dissatisfaction with career prospects

Worry that no jobs will be available on qualifying	13
Boredom with job	3
Restricted career opportunities	2
Blocked mobility	3

One candidate also expressed disquiet that the proposed University course at Massey could undermine present qualifications and lead to two levels of technologist. Another felt that there was 'a lack of opportunity for graded staff to develop new ideas'.

LEISURE TIME ACTIVITIES:

This question proved of little worth other than to show that technologists as a group must be the fittest and most interesting people you could hope to meet. They indulged in every activity imaginable from music to karate and skydiving with one intrepid soul (who failed) opting for sex as her principal hobby. Perhaps in view of the heavy academic schedule it all had an effect in the pass rate that was not immediately obvious.

TEXT BOOKS AND JOURNALS

Six candidates reported that they did not have access to a library, two were from private laboratories and the other four from hospital laboratories with less than 15 staff. Five reported that their laboratories did not possess copies of current textbooks, 2 from the same very small hospital laboratory and the others from hospital laboratories with less than 30 staff. All but 9 laboratories received current journals but only about half the sample received any encouragement to read them.

SIZE OF LABORATORIES:

Laborotories were broadly classified as large (>100 staff all disciplines), medium sized (50-100 staff), and small (<50 staff) with private laboratories forming a separate group. The results as shown in Table 16 would seem to indicate that the medium sized laboratory is the best place to train. The smaller laboratory may not be able to offer the same range of work experiences and the largest laboratories tend to become rather impersonal in their treatment of trainees.

Table 16: Comparison of laboratory sizes

Size of Laboratory	Fail	Pass	Total	Pass rate
Public <50	9	15	24	62%
Public 50-100	1	6	7	86%
Public >100	9	21	30	70%
Private	2	3	5	60%

In the case of private laboratories their lower pass rate may have reflected their selection methods. None of the five candidates had come directly from school, four had been in previous employment and one at university. The four who had supplied School Certificate marks had all received <350 for five subjects.

BLOCK COURSE ATTENDANCE:

Figures from the CIT indicate that the pass rate for those attending block courses at Heretaunga is not materially different from the pass rate for those attending their local polytechnic (Table 17). As the candidates examined here form a representative sample of the total population separate figures have not been calculated.

Table 17: CIT and national pass rates MLP II 1980

Paper	CIT Candidates	% Pass	National Candidates	% Pass
A (Haem/Immuno)	32	81	92	80
B (Micro)	33	87.8	89	85
C (Biochem)	33	87.8	90	81

TUITION

Very few laboratories apparently supplement the teaching provided by polytechnics to any appreciable degree. Twenty-two candidates (35%) reported receiving extra tuition within their home laboratories but in many cases the amount received was so meagre as to be funny. Candidates reported having received '2 lectures of 1 hr duration on Quality Control for Biochemistry', '4 hrs in Chem Path', 'a couple of lectures in Haematology', and one person added rather forlornly 'Nobody seems interested in teaching third years'. In all cases where tuition was given it was carried out by qualified staff—staff technologists, scientific officers, graded officers and charge technologists. Eight candidates had been given assistance with calculations and 2 had been set test papers. A breakdown of those who reported receiving extra tuition is given in Table 18.

In most cases the amount of help given was too minimal to have had any effect on examination passes. In some instances candidates from the same laboratory gave differing answers, some indicating that they had had tuition, others that they had not. In view of the paucity of some of the assistance given this was hardly surprising.

Table 18: At work tuition given to Year 5 NZCS candidates

Lab. Size	Subject(s) Given	Frequency
Large	Haem/Biochem	Variable
Large	Haem	Variable
Large	Biochem	Monthly
Private	All subjects	Not Stated
Private	Haem/Micro	2 x weekly
Small	Micro/Immuno	Sporadic
Large	Biochem	2-4 hrs/week
Small	Micro	Weekly for 6 wks
Small	Immuno	Once in 3 years
Large	Biochem	2 x 1 hr lectures Q.C.
Large	Biochem	4 hrs once
Large	Biochem	Weekly
Large	Biochem	When requested
Large	Biochem	Occasionally
Large	Micro	Weekly
Large	All subjects	Not stated
Large	Haem	A couple of times
Large	Haem/Biochem	Lunchtimes
Small	All subjects	3 x weekly for 1 month

WORK STUDY:

Forty-nine candidates (79%) reported that they were encouraged to study at work if time permitted and of the 15 who were not encouraged 3 stated that they did study regardless. Those who did study at work managed to fit in between 1 and 8 hours a week with the exception of one individual who claimed 16 hours a week! Fifty-six candidates (89%) also studied at home, often for long periods of time towards examination time (Table 19).

Table 19: Time spent on study by Year 5 NZCS candidates

Hours/Week	Home Study No. of Candidates	Work Study No. of Candidates
Nil	9	8
<2 hrs	14	
2-5 hrs	11	11
5-10 hrs	7	10
10-20 hrs	1	20
>20 hrs		2

DISMISSAL OF STAFF:

Twenty-nine candidates worked in laboratories which had a policy of sacking NZCS candidates who failed the same exam twice (see Figure 2). The threat of dismissal appeared to have no overall effect on the pass rate although an examination of those who were repeating a subject in 1980 showed that all had passed except one who came from a laboratory which did not have a dismissal policy.

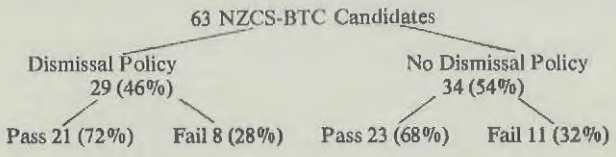

Figure 2: Laboratory dismissal policies

CANDIDATES' REASONS FOR FAILURE:

Of the 19 candidates who failed only 5 expressed surprise at their failure. The main reasons given by candidates for their failure are summarized in Table 20.

Table 20: Candidates' reasons for exam failure

Reason	Number of Candidates
Pressure of work	6
Poor tutoring	9
Social life	6
Poor exam technique	5
Illness	1
Personal problems	2
Too tired	1

One candidate who could have reasonably been expected to pass could not be accommodated at CIT in 1979 due to a mixup over the number of students requiring to attend. She was forced to do both stage 4 and 5 in 1980 and found the burden of study overwhelming. Another spent the week before exams on night duty and a third was denied permission to take annual leave to study.

Only five candidates were given extra tuition by their home laboratories in preparation for sitting the exam(s) again and two of these were from the same laboratory. One letter received seemed seemed to sum up the feelings of many of the candidates and is worth quoting at length:

'Since I began my training in the lab none of the Charge Techs or staff techs have enquired about my progress or how I am finding the course. At times I have approached them about my study but no great interest has been shown. I feel that the emphasis seems to be on getting the work done in the laboratory and that study and passing the exams is the trainees' worry . . . Even after failing last year no great interest has been shown in my progress this year. I feel as if I have been left to struggle on my own.'

Conclusion

Machlup (1970)[5] referred to educational efforts as being consumption, investment, waste or drag. Medical Technology has become a highly academic course and unless trainees can pass their exams much of the effort expended is wasted. Since the number of applicants greatly exceeds the number of places available decisions have to be made as to who will be accepted for training and who will be rejected. Academic criteria obviously belong high on the list of necessary attributes and in the first instance a simple ranking system with a cutoff point at for instance a total of 320+ over five subjects for School Certificate could be applied. The cutoff point needs to be low enough to give a reasonable pool of candidates for final selection on the basis of other factors. Although the choice of a higher cutoff point would undoubtedly reduce the failure rate it would also exclude a large number of candidates who could have passed. The actual subjects passed in School. Certificate appear to be immaterial but particular University Entrance subjects are required as they are prerequisites to the NZCS course. It does not seem necessary or even desirable to demand a seventh form year. These initial objective judgements made on the basis of concrete data can be followed by the more subjective selection process dependent on personal interviewing. For maximum reliability and to avoid personal bias the interview should be carried out by a panel to a standardized format and preplanned so as to make efficient use of the time available.

The 'ideal candidate' would be male or female, direct from the sixth form at school and in the top third of their class. They would have averaged more than 70% per subject for School Certificate and have been accredited University Entrance on their first attempt. Their introduction to the job would have been through Vocational Guidance, who are incidentally making an excellent job of channelling suitable candidates into the job.

The worst choice for a trainee would have to be the candidate who has been in previous employment (particularly the ex-laboratory assistant), whose School Certificate marks averaged less than 60% per subject and who took two years to get University Entrance. They would have been in the bottom third of the class for their final year at school and have been introduced to the job by a friend.

This is all rather tongue in cheek of course, the best predictors are bound to be fallible but it is impossible to doubt the general conclusions. There are a number of uncontrolled and uncontrollable factors other than intelligence which have an effect on academic success and undoubtedly some candidates fail who should have passed and others pass who did not really deserve it. However, broadly speaking, success breeds success and examinations are not lotteries. Those with ability should have no

problems, those with less ability who put in the work will also pass and those without a certain basic level of ability will fail. The top group do not necessarily make the best technologists and indeed a substantial number of them become bored and move on to 'better things' as evidenced by the number of technologists entering Medical School. Conversely it would be difficult to prove that they make worse technologists on average than any other group and they are certainly less of a headache to the laboratory manager than the borderline candidate.

It is the middle group, those who are capable of passing given support and motivation who need our attention. Few laboratories are providing organized systematic assistance to trainees in their first three years—it is as though having handed over tuition of NZCS candidates to polytechnics has absolved us of any further responsibilities. Although most candidates are well served in terms of textbooks the tuition that is given is in the main patchy and dependent on the whim of staff in particular disciplines. Some areas such as quality control are not easily covered outside the laboratory and much of the practical work would be impossible to cover completely in the limited time available. Students who have difficulty with problem solving need regular encouragement and assistance which does not seem to be forthcoming. Main (1981) the Polytechnic Liaison Officer of the Institute pointed out that tutors themselves have stressed the need for a programme of continued study, revision and testing, particularly of students who attend block courses in the 1st or 2nd term, to be instituted by Charge Technologists. In view of the numbers expressing disquiet about their career prospects careful attention should be paid to the numbers being trained and the current turnover rate. There are already unemployed medical technologists and with the number of married women re-entering the workforce to resume their careers and the current economic climate encouraging people to stay put in a secure job the problem can only get worse. New staff should be fully aware of the career structure and their prospects—to leave because of blocked mobility or boredom at the end of five years' training is a waste of the human resource.

Laboratory managers have an obligation to their staff to ensure that they receive adequate grounding in all aspects of their training, and to provide supportive assistance to those who require extra tuition. It is difficult coping with staff at five different levels of training but at the very least comprehensive records of what each trainee has covered and an organised rostering system to ensure their knowledge of all sections of the laboratory are required. Too often nothing is known of a student's progress until they fail an exam, and liaison with the polytechnics in the form of student reports, particularly to bring to notice their weaknesses, is worth considering.

The issues are complex and selection of candidates likely to succeed is only the first step, it must be followed up by providing a nurturing environment where staff can develop to the limits of their potential and exams become stepping stones in the learning process rather than hurdles to bring down as many as possible. A failure rate of nearly ⅓ in only one year of a five-year training period demands our attention. Our good students are passing in spite of us, our average students are failing because of us.

Appendix 1: LIST OF FIGURES

Figure 1: Response rate of NZCS-BTC candidates; Figure 2: Laboratory dismissal policies.

Appendix 2: LIST OF TABLES.

Table 1 Breakdown of 1980 NZCS examination results. Table 2 Breakdown of 1980 NZCS-BTC examination results by subject. Table 3 Response rate by district. Table 4 Pass rates of NZCS-BTC candidates by sex. Table 5 Pre-training activities of NZCS-BTC candidates. Table 6 Classification of school leavers. Table 7 Chi Square Table—Comparison of School Certificate marks. Table 8 Chi Square Table—Comparison of School Certificate marks. Table 9 Chi Square Table—Comparison of School Certificate Science marks. Table 10 Chi Square Table—Comparison of School Certificate English marks. Table 11 Relationship of UE pass. Table 12 Comparison of final year class position. Table 13 Mode of introduction to MLT. Table 14 Mode of selection of trainees. Table 15 Reasons given for dissatisfaction with career prospects. Table 16 Comparison of laboratory sizes. Table 17 Block course attendance. Table 18 At work tuition. Table 19 Time spent on study. Table 20 Candidates' reasons for exam failure.

Appendix 3: THE QUESTIONNAIRE

I am presently engaged in a study of the pass/fail rates for third year NZCS students to try and define reasons for failure and/or to identify likely successful candidates. As a 1980 candidate I would be grateful if you would complete and return to me the enclosed questionnaire as soon as possible. All information supplied will be treated in complete confidence and the final analysis will not include any personal identification. This survey has the support of the Medical Technologists' Board and results will be a subject of future publication in the NZIMLT Journal.

JANICE E. PARKER
Graded Officer

.....

A. 1. Date of Birth _____

2. Year training commenced 19_____

3. School Certificate year sat 19_____

Subject	Mark/Grade	Subject	Mark/Grade

4. University Entrance year obtained 19_____

Subject	Grade (put AC if accredited)

5. Grade or position in class final school year (end of year exams.)

Subject	Grade/ Position	Subject	Grade/ Position

If unknown indicate top third, middle, bottom third

6. Did you attend the seventh form? YES/NO
7. If yes to question 6 did you obtain a bursary? YES/NO
8. Did you begin training directly from school? YES/NO
   If no what did you did in the interval?

.....

.....

9. Did you apply for training on more than one occasion? YES/NO
10. Did you apply for any other jobs? YES/NO
    If yes, specify what

.....

.....

11. How did you become interested in medical laboratory technology?
    - ☐ Through a member of your family
    - ☐ Through a friend
    - ☐ School Vocational Guidance
    - ☐ Other (Specify) .....

    .....

12. What form did your selection take?
    - ☐ Interview with departmental heads
    - ☐ Interview with pathologist
    - ☐ Written application only
    - ☐ Other (Specify) .....

    .....

13. Were you familiar with the career structure when you began? YES/NO
14. Are you satisfied with your career prospects now? YES/NO
    If not why not? .....

    .....

15. What leisure time activities do you pursue?
    - ☐ Sport
    - ☐ Handwork (specify type)
    - ☐ Clubs (specify)
    - ☐ Other (specity) .....

    .....

16. Does your workplace possess a library? YES/NO
17. Are current textbooks owned by the laboratory? YES/NO
18. Does your laboratory receive journals, e.g., Clin. Chem. Acta, Clinical Chemistry? YES/NO
    If yes, are you encouraged to read them? YES/NO

The following questions relate to your year V (1980) subjects.

B. 1. Did you attend a block course? YES/NO .....

If so where did you attend? .....

Which term did you attend? .....

2. Is your laboratory private or public? .....
3. Approximate number of staff employed in your laboratory (all disciplines) .....
4. Is laboratory manual/semi-automated/automated?
5. Were you given extra theory tuition by your home laboratory? YES/NO
   If yes, what subjects? .....
   Who by? (qualifications) .....

   .....

   .....

   Frequency .....
   Did it include mock exams? YES/NO
   Did it include problem solving? YES/NO
6. Were you given practical assignments by your home laboratory? YES/NO
   If yes, what subjects? .....

   .....
   Who by? (qualifications) .....

   .....

   Frequency? .....
7. Were you encouraged to study at work if time permitted? YES/NO
8. Did you do extra study at work? YES/NO
   If yes, approx. hours/week? .....
9. Did you do extra study out of working hours? YES/NO
   If yes, approx. hours/week? .....
10. Does your laboratory have a policy of dismissing staff who fail the same exam twice? YES/NO

Answer the following three questions only if you failed an exam in 1980:

11. Were you surprised by your failure? YES/NO
12. What did you feel were the major factors contributing to your failure?
    - ☐ Pressure of work
    - ☐ Poor tutoring
    - ☐ Social life
    - ☐ Other specify .....

    .....

13. Has your laboratory given you additional tuition this year? YES/NO
    If yes, what form did it take?

    .....

    .....

    .....

14. NZCS Grades

Year 19____		Year 19____	
Subject	Grade	Subject	Grade

Appendix 4: THE FOLLOWUP LETTER

O.H.B. 159. Telephone 740-999, 11 December 1981.

In early November you would have received a questionnaire from me relating to NZCS. I have not received a reply and as I need as complete a sample as possible for validity could I bring the matter to your attention again.

JANICE E. PARKER
Graded Officer

Appendix 5: BIBLIOGRAPHY

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LETTER TO THE EDITOR

Dear Sir,

I wish to describe a case of Paroxysmal Cold Haemoglobinuria which has recently been investigated in part by our laboratory. Paroxysmal cold haemoglobulinuria (PCH) is one of the more rare of the autoimmune haemolytic syndromes. It is characterized by acute, intermittent massive haemolysis, frequently with haemoglobinuria following exposure of the afflicted patient to cold, either local or general.[1,2] Reports have appeared which describe PCH in association with viral illnesses such as mumps, measles, chicken pox, infectious mononucleosis, and the ill-defined 'flu syndrome.[2,3]

A four-year-old child was admitted to Princess Mary Hospital in Auckland in late November, 1980. The presenting symptoms were described as —(a) facial rash (3 days), (b) haematuria (12 hours), (c) epigastric pain (2 days), (d) tremors, (e) facial swelling (1 day). The child's mother described intermittent rashes to the face and limbs. The child had experienced at home two distinct episodes of shivering associated with abdominal tenderness.

On the day of admission the following blood tests were performed, all of which were normal: urea, sodium, potassium, creatinine, bilirubin. The urine on the same day was reported as being a deep red colour with no red cells present. Two days following admission, the child had a facial rash and a sore throat. X-rays were taken of the chest and abdomen and reported as being normal.

The haematological data was obtained over a period of three separate days and was essentially normal on the first occasion.

In early December 1980 the child developed a further papular rash from the ring of the toilet seat at "pressure points". Over the next 12 hours the rash appeared on the child's face, hands, ankles and was "itchy". At this stage there was no shivering or haemoglobinuria.

On the following day a Ham's acidified serum test and sucrose lysis test, along with the Donath-Landsteiner test, were performed. The Ham's and sucrose lysis tests were both negative. The significant finding was the positive result for the Donath-Landsteiner test.

Blood was collected into a sterile syringe and approximately 2 ml of blood was transferred to each of two glass tubes. One tube had been on ice and the other warmed to 37°C prior to the addition of blood. The tube that was warmed was kept at 37°C for 30 minutes and the other at 0-4°C for 30 minutes. After the 30 minutes, the cold tube was transferred to the 37°C water bath and both tubes were incubated for a further hour. The tubes were then centrifuged and examined for haemolysis.

In Paroxysmal Cold Haemoglobinuria, a positive test is shown by the presence of haemolysis in the "cold" sample but not in the tube that had been kept at 37°C.

In this case, haemolysis was readily apparent in the "cold" tube with no evidence of haemolysis in the tube that had been kept at 37°C.

The pertinent haematological data is summarised in Table I.

The most significant finding is the slight but definite drop in the haemoglobin level.

Donath and Lansteiner recognised the involved complement-dependant auto antibody, termed the D-L type of cold haemolysin, in 1904[2]. The association of PCH with syphilis, particularly congenital syphilis, had been recognised considerably earlier. The Donath-Landsteiner antibody has been shown to be an IgG globulin. Othe workers have demonstrated that the antibody is a 7S Ig Globulin similar if not identical to anti $^{1}P + P_1 + P^K$ (anti T_j^a); an antibody directed against the P antigens (P and P_1) of human erythrocytes. The titre of the antibody is usually low compared to those that develop with cold agglutinin disease[4,5]. The antibody requires the following conditions for its full activity: (a) complement, (b) red cell antibody system chilled to fix the antibody to the red cell, (c) sensitized cell-complement system warmed for haemolysis to occur. The haemolytic episodes may not be recurrent nor related to cold and the suggestion has been made that the name of the disorder be changed from Paroxysmal Cold Haemoglobinuria to Donath-Landsteiner Haemolytic Anaemia[3]. Although the clinical manifestations of this disorder tend to be self-limiting and of short duration, it may be necessary to provide blood transfusion during the haemolytic stage. The child in this case did not require supportive measures of this nature.

TABLE I
Haematological Data

	28.11.80	29.11.80	2.12.80
Hb g/l	120	114	115
RBC × 10^{12}/l	4.40	4.36	4.30
MCV fl	79	78	81
PCV	0.35	0.34	0.35
MCHC g/l	340	340	330
MCH pg	27	26	27
Reticulocytes 10^9/l	—	—	56
Morphology	N	N	N
WBC 10^9/l	9.2	10.0	18.7
Platelets	N	N	N
E.S.R. mm in 1 hour		—	—

Your sincerely,
Bruce F. Postlewaight
Graded Technologist
Department of Haematology
Auckland Hospital.

References

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BOOK REVIEWS

Radionuclide Tracer Techniques in Haematology. C. S. Bowring, Butterworths 1981 140pp. Available from Butterworths NZ Ltd, CPO Box 472, Wellington.

Radionuclide Tracer Techniques in Haematology is designed to give prospective users of radionuclides in haematology a review of all the techniques that are available currently. It also gives useful advice on how and when they should be applied.

For those who are starting in this specialized field of investigation, the first two chapters cover the basic properties of radionuclides and the instrumentation that is used for their detection and measurement. There are chapters on the measurement of blood volume and on red cell, white cell, and platelet survival; ferrokinetic studies; the use of external counters, imaging and quantitative scanning techniques and finally a chapter devoted to the assessment of vitamin B_{12} and iron absorption. Useful appendices include documentation of (i) labelling procedures, (ii) the derivation of the Dornhorst Equation for red cell survival, (iii) calibration of imaging equipment, (iv) radioassay techniques.

Throughout the book Dr Bowring has drawn extensively on the vast experience and developmental work carried out by his former colleagues at the Royal Postgraduate Medical School. The theory, practice, interpretation and clinical usefulness of these tests are discussed. The main techniques described are those that have been recommended by the International Committee for Standardization in Haematology. Sufficient detail is included to allow the book to be used as a laboratory work book and its size allows it to be carried conveniently in the pocket of a standard white coat.

The literary style is good, the diagrams are particularly clear and there is a comprehensive reference list at the end of each chapter. As an introduction to this subject it is a difficult book to fault. I recommend it warmly.

J. E. Pettit,
Associate Professor of Haematology,
University of Otago Medical School.

ABSTRACTS

HISTOLOGY

Demonstration of Neurofibrillary Tangles in Paraffin Sections: A Quick and Simple Method Using a Modified Palmgren's Method.
Cross, R. B. (1982, *Med. Lab. Sci.* **39**, 67.

A modification of von Braunmuhl's technique using paraffin sections is described. This is a quick easy method using simply prepared reagents and producing a clear background.

An Inproved Alum Hematoxylin Method with Application of Mayer's Hemalum for Staining Elastic Fibres.
Akita, M. and Kaneko, K. (1981), *Stain. Technol.* **56**, 327.

A method is described in which Mayer's hemalum is adjusted to pH 8 to stain elastic fibres without differentiation.

Practical Use of a Word Processor in a Histopathology Laboratory.
Briggs, J. C., Ibrahim, N. B. N., Mackintosh, I. and Norris, D. (1982), *J. Clin. Path.* **35**, 151.

Some of the facilities available with a commercially purchased word processing program, linked to a DEC PDP 11/23 computer are described, together with an account of the practical histopathological use.

Enzyme Histochemistry on Paraffin Embedded Tissue Sections.
Fujimori, T., Miura, M. and Katayama, I. (1981), *Stain. Technol.* **56**, 355.

To obtain diagnostic enzyme reactions in paraffin embedded tissue sections various fixatives and processing regimes were compared. The best results were obtained by a method using buffered formalin-acetone, Holt's gum sucrose, dehydration in acetone with 0.03% Triton X-100, and paraffin for embedding.

Whither Histopathology—Ten Years On.
Allison, R. T. and Nunn, R. E. (1982), *Gazette of the I.M.L.S.* **26**, 46.

An appreciation of recent developments in histopathology and an insight into changes current research and developments may have on today's routine.

Paraplast—Piccolyte Double Embedding.
Bogomoletz, W. V. and Potet, F. (1981), *Arch. Pathol. Lab. Med.* **105**, 670.

A critical study of a Paraplast-Piccolyte S-115 double embedding techniqua, using conventional laboratory equipment, is presented. This technique produces thinner sections (1 to 3 microns) that allow better study of cellular detail and compare favourably with semi-thin resin sections.

A Chemical Test to Determine the End Point of EDTA Decalcification.
Seilly, D. J. (1982), *Med. Lab. Sci.* **39**, 71.

A method is described in which calcium is displaced from the EDTA complex by the addition of ferric ions, which may then be precipitated by adding excess oxalate. The resulting turbidity of the solution indicates the amount of calcium present.

HAEMATOLOGY

Platelet Hypersensitivity in Acute Malaria (Plasmodium falciparum) Infection in Man.
Essien, E. M. and Ebhota, M. I. (1981) *Thrombos. Haemostas.* **46** 547.

During acute malaria infection, platelets in human platelet-rich plasma are hypertensive to the addition of ADP and adrenaline. Also the mean B-thromboglobulin concentration was significantly higher than the control group. The authors conclude that there is at present no evidence to suggest that acute malaria infection is associated with an increased tendency to thrombosis either in the immune or non-immune patients.

Symposium : Haematology. *The Practitioner* **226** 23

This useful symposium, published in The Practitioner as a guide for general practitioners, includes such papers as: A Field Guide to Bleeding Disorders; The Haematology Laboratory and The General Practitioner; Impaired Erythropoiesis;' Disorders of Leucocytes; Diagnosis and Treatment of Polycythaemia; and Eosinophilia. These papers are brief, but pertinent reviews of a number of common aspects of Haematology.

A Study of the True Competitive Protein Binding of Current Vitamin B_{12} Radioassays.
Brown, R. D., Robin, H. and Kronenberg, H. (1982) *Pathology* **14** 31.

The use of purified intrinsic factor in vitamin B_{12} radioassays has greatly reduced the misdiagnosis of pernicious anaemia in recent years, but anomalies still occur. The authors discuss potassium cyanide concentration as a major cause of concern.

A Rapid and Accurate Differential Centrifugation Method for Platelet Counts.
Cousins, S., and Lewis, S. M. (1982) *J. Clin Pathol.* **35** 114.

Many platelet counting instruments require the preparation of platelet-rich plasma, obtained either by sedimentation or centrifugation. The authors demonstrate a modified differential centrifugation method using whole blood and a solution of sodium metrizoate which allows the platelet count to be carried out easily and rapidly, without loss of accuracy and precision.

Staining of Granulocytic Cells by Chlorazol Black E.
Kauss, L. *Am J Clin Pathol* **76** 810

Chlorazol black E is a trisamo dye that demonstrates staining of granules in both mature and immature granulocytes. Since other types of cells do not demonstrate this staining property, Chlorazol black E can be used to distinguish granulocytic cells from other types of cells. Chlorazol black E has the advantage of being a single agent stain.

Acid Phosphatase Staining Pattern as an Indicator of T-cell Acute Leukaemia.
Savage, R. A., Valenzuela, R., and Hoffman, G. C. *Am J Clin Pathol* **76** 760

This study indicates that acid phosphatase staining pattern will correlate with the results of E rossette testing in both T-cell and non-T, non-B acute lymphoblastic leukaemias in over 90% of cases.

A Lyophilized Human Reference Plasma for Coagulation Factors.
Dombrose, F. A., Barnes, C. C., Gaynor, J. J. and Elston, R. C. *Am J Clin Pathol* **77** 32.

Results are reported of a one-year study on the stability of a lyophilized normal human reference plasma, orlginally standardized for nine clotting factor activities. The factors concerned were I II V VII VIII IX X XI XII. The authors conclude that a lyophilized human plasma can be used as a stable secondary standard reference for the assay of coagulation factors.

Microclot Generation (M C G) Test in Disease.
Juhlin, L., and Shelley, W. B. (1981) *Acta Med Scand* **210** 305.

Heparinized blood was taken up into capillary tubes and kept in a vertical position at 37°C for 24 hours to allow the red cells to sediment. Microclots appearing as radiant fibrin stars were seen under phase microscopy in the plasma portion of blood from certain patients. Such a positive microclot generation test occurred in patients with some inflammatory diseases and cancer as well as in patients with certain skin disorders. The data suggest that the M C G test may serve in the detection of endotoxaemia.

Haematological Abnormalities after Oral Trimethoprim Sulphamethoxale Therapy in Children.
Asmar, B. I., Maqbool, S., and Dajani, A. S. (1981) *Am J Dis Child* **135** 1100.

The authors evaluated 50 children tested for ten days with oral trimethoprim-sulphamethoxale and compared the development of any haematological abnormalities with 20 children treated with amoxicillin trihydrate. They found 34% developed polymorphonuclear neutrophilic leucopenia and 12% thrombocytopenia with trimethoprim-sulphamethoxazole compared with 5% leucopenia and no thrombocytopenia with amoxicillin trihydrate. The authors suggest that children treated with trimethoprim-sulphamethoxazole should be followed up with biweekly leucocyte and platelet counts.

E.R.C.

An Improved Histochemical Method for Distinguishing Colonic Acetylsialomucin from other Epithelial Mucins.
Cooper, J. H. and Durning, R. G. (1981, *J. Histochem. Cytochem.* **29**, 1445.

A technical modification of the original method is described. The modification uses a naphthoic acid hydrazide-diazonium salt sequence in place of the original borohydride or blue Schiff treatments in the first stage of the procedure and a more dilute periodic acid in the second. Strongly contrasting staining is achieved.

Four Unlabelled Antibody Bridge Techniques: A Comparison.
Ordronneau, P., Lindstrom, P, B-M. and Petrusz, P. (1981), *J. Histochem. Cytochem.* **29**, 1397.

Four unlabelled immunocytochemical techniques, the "single bridge", the "single peroxidase-anti-peroxidase", the "double peroxidase-anti-peroxidase" and the "double bridge" are compared at the light and electron microscopy level.

Staining Intestinal Spirochaetes.
Burns, P. A. (1982), *Med. Lab. Sci.* **39**, 75.

A modification of Dieterle's technique is described which gave significantly better results than classical methods and allowed the spirochaetes to be clearly seen in photomicrographs.

GENERAL ABSTRACT

New Zealand—A Conference Visitor's View.
Collins, C. H. (1981), *Gazette of the I.M.L.S.* **25**, 505.

Views of N.Z. and the 37th Annual Conference from this guest lecturer's angle.

B.C.T.

MICROBIOLOGY

Comparison of the Quantitative Direct Plating Method and the BACTEC Procedure for Rapid Diagnosis of *Haemophilus Influenzae* Bacteremia in Children.
LaScolea, L. J., Dryja, D. and Neter, E. (1981), *J. clin. Microbiol.* **14**, 661.

In this study the blood cultures consisted of BACTEC aerobic bottles with heparin tubes attached. After inoculating the BACTEC bottle the heparin tube was injected with 0.2-1.0ml blood. In the laboratory the blood in the heparin tube was pipetted onto blood agar and chocolate agar plates which along with the BACTEC bottles were then incubated.

Out of a total of 41 positive cultures of *H. influenzae* by the BACTEC system 36 were positive by Q.D.P. However in the first twelve hours of incubation the Q.D.P. detected 61% of positives whilst the BACTEC detected only 7%. The QDP also detected 56% of *H. influenzae* cultures before a positive reading with the BACTEC system. The authors conclude that the Q.D.P. method is a good supplementary technique to the BACTEC system in the diagnosis of *H. influenzae* bacteremia in children.

Comparison of a Modified Microagglutination Technique for HBsAg with the Standard Technique and a New RIA System.
Supran, E. M., Gardner, P. S., Cayzer, I., Court, G. and Chalmers, S. (1982), *J. clin. Pathol.* **34**, 1396.

Some modifications to the RPHA (Hepatest Wellcome Reagents) were made and the modified method compared with the standard RPHA method and RIA (Hepatube Wellcome Reagents) method in the detection of HBsAg. 939 clinical specimens were tested and 53 found to be positive by RIA. 50 of these were positive by the modified RPHA and 47 positive by the standard RPHA. The modifications included diluting the Hepatest cells, supplementing the buffer with turkey serum, using V bottomed microtitre plates and leaving them for 1½ hours. These seemed to increase the sensitivity and lower the cost of the test.

Evaluation of the Phadebact Gonococcus Test in the Identification of *Neisseria gonorrhoeae* in a Routine Diagnostic Laboratory.
Tompkins, D. S., Nehaul, B. B. G., Smith, Carolyn A. F. and Cooke, E. Mary (1981), *J. clin. Pathol.* **34**, 1106.

The Phadebact Gonococcus Test was compared with the immunofluorescence test for identifying gonococci in a routine diagnostic laboratory.

When the method using a boiled suspension of colonies was used the Phadebact Test was 100% specific and quite sensitive. In contrast cross reactions with *N. meninigitidis* gave false + reactions with the immunofluorescence Test.

Comparison of Three Collection-Preservation Methods for Detection of Intestinal Parasites.
Price, D. L. (1981), *J. clin. Microbiol.* **14**, 656.

The three collection-preservation methods that were compared for effectiveness and time efficiency were Merthidate/iodine/Formalin, Formalin, and polyvinyl alcohol fixative. No method detected all the parasites but the Merthiolate/iodine/Formalin system was more effective. However the number of faecal specimens (39) found to have parasites was small.

S.G.

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The United States Department of Commerce is sponsoring a catalogue show of instruments and related equipment to be held in Auckland on July 15-16, and Wellington on July 19-20. The show will feature catalogues from over 150 American companies introducing a wide range of products including scientific, laboratory, surgical, medical and optical instruments; x-ray and electromedical apparatus; laboratory glassware; electronic production and test instruments and parts; electronic computing equipment; process control instruments; environmental controls; physical properties test and inspection equipment; surveying and drafting instruments, and many other instruments and parts.

In addition to the product catalogues, Mr Peter J. Brennan, the International Trade Representative for the show, will be present at the exhibition to answer questions about the products on display, and to assist visitors in locating specific types of equipment. Mr Brennan is a recognized expert in all areas of the instrumentation field, and is currently Consulting Editor of the trade publication, "International Instrumentation and Control". He will be happy to discuss current technology and equipment applications in the United States and abroad.

We invite you to visit the show to examine the catalogues and discuss with Mr Brennan the application of these products to your particular activities. If you would like more information about the exhibition, please contact the Commercial Office at the American Embassy, Wellington, telephone: 722-068, telex: NZ3305; or the American Consulate General, Auckland, telephone: 32-038. No pre-registration is required to visit the show.

Auckland: July 15-16, 9.30am—4.00pm.
American Consulate General,
4th Floor, General Building,
Shortland Street, Auckland.

Wellington: July 19-20, 9.30am—4.00pm.
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Membership Fees and Enquiries
Membership fees for the year beginning April 1, 1981 are:
For Fellows—$37 reducible to $32 if paid by June 30 that year.
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All membership fees, changes of address or particulars, applications for membership or changes in status should be sent to the Membership Secretary at the address given above.

Members wishing to receive their publications by airmail should contact the Editor to make the necessary arrangement.

COUNCIL NOTES

Council met at Auckland on the 6th and 7th May, 1982, Mr A. F. Harper in the chair.

CONDITIONS OF EMPLOYMENT

Salaries and Conditions

As a result of the decision of the Tribunal on the case presented by the NZEI, Salaries and Conditions can no longer be negotiated as Interservice except where external comparability or problems of retention and recruitment can be demonstrated.

Vote of Thanks

The Council of the NZIMLT wish to thank the Negotiating Committee for the effort which has been put into the preparation of the claim. It is unfortunate that events outside the control of the committee have prevented use being made of their work.

Renegotiation of Standard Conditions of Employment DG48

Negotiations as to the structure and legality of the Renegotiation Committee are continuing with the Department of Health.

The deliberations of the committee are likely to be lengthy and complex, members of the NZIMLT wishing to express an opinion are advised to contact the Secretary of the NZIMLT.

The following letter has been received via Mr Best of the NZNA. The letter explains the D.O.H. thinking on how the committee is to operate.

Mr Derek Best
New Zealand Nurses Association

Dept. of Health
Wellington

STANDARD CONDITIONS OF EMPLOYMENT DG 48

1. I am replying to your letter of 11 January 1982, in which you advise that a representative subcommittee has been set up to deal with negotiations on "standard" hospital conditions.

2. As the subcommittee will not have the status of a "recognised" service organisation in terms of the 1977 Act, there are still some problems to be overcome. It would appear however that these could be dealt with in the following manner.

(1) Such claims as the subcommittee and its constituents have agreed to put forward could be lodged with the Director-General of Health in the usual manner.

(2) These could be processed through State Services Co-ordinating Committee either in the context of an employee organisation claim, or if there is any question as to the legality of this situation in terms of the 1977 Act, as a section 30 review.

(3) This would clear the way for discussions to proceed between the representative subcommittee and the Hospital Service Committee.

(4) In the event that agreement could not be reached in this forum, it would still be possible for the subcommittee to have recourse to the Tribunal by lodging a joint application on behalf of all recognised service organisations. The legality and form of such an application would, however, need to be considered, i.e. can service organisations delegate their role and responsibilities to the subcommittee on matters of common interest, or must all either apply or be signatories to a common application.

3. Before formally agreeing to proceed on this basis, however, I believe that we will need to have from you, a more detailed proposal outlining the membership, terms of reference, and organisations involved in the subcommittee. We will, of course, need to be assured that the agreements negotiated with the subcommittee will be accepted by all the recognised employee organisations in the hospital service.

4. So far as the remaining points in your letter regarding Block A negotiations are concerned, I can confirm that it is the normal practice for these to be passed on to the hospital service once agreement has been reached between State Services Co-ordinating Committee and Combined State Unions.

Yours sincerely,

T. J. Neilson,
for Director-General of Health.

Suggested Staff Exchange Scheme

Negotiations are proceeding favourably and completion is expected this year.

The Department of Health has commented favourably and the majority of the Hospital Boards have also favoured the idea though some express reservations about the practicality of some points. The correspondence is in part reproduced below.

Mr B. T. Edwards — Hospital Boards Association
Secretary — of New Zealand
N.Z. Institute of Medical Laboratory Technology (Inc.)

Dear Mr Edwards,

SUGGESTED STAFF EXCHANGE SCHEME FOR MEDICAL LABORATORY TECHNOLOGISTS

The Association has now received comments from the Department of Health on the proposed exchange scheme. The department's response is favourable and the text of the letter is as follows:

"The department approves of this proposal and the Institute is to be be commended for its initiative. It is felt that the benefits of this scheme will outweigh any practical difficulties.

We believe that the scheme would be simpler to organise if families were not involved and a maximum transfer period of 6 months is considered to be fairly long for this type of exercise.

It is also recommended that when boards have applicants for exchange the Institute should make arrangements with the board concerned rather than leave it to the individual to organise."

I have also had a chance to evaluate the comments from hospital boards. In general boards have supported the idea in principle, and approximately half of the boards state that the scheme as outlined would be satisfactory. However a number of boards have expressed reservations regarding the practical implementation of the exchange scheme.

In order that you are as fully informed as possible, I have not attempted to summarise these reservations, but have attached the full texts of eight board replies which go into some detail in their comments on the possible practical difficulties involved.

It is possible that I may be visiting Christchurch within the next two months, and I would welcome the opportunity to discuss the exchange scheme with you in the light of hospital board comments. Once a proposal has been developed that would be acceptable to boards in detail, the scheme will be put to the Association's Executive for consideration.

I hope that this information proves helpful.

Yours sincerely,

P. G. Herman,
for Acting Executive Director,
Hospital Boards Associaton of New Zealand.
16/3/82

COMMENTS OF THE HOSPITAL BOARDS

"Your Circular HBA 1981/52 of 15 April 1981 was referred to our Charge Medical Technologist. His comments follow and are supported by the Board.

'I have discussed the Hospital Boards' Association Circular with our qualified technical staff.

In the face of it this is an excellent idea, but there are snags which would make it difficult to introduce such a scheme here.

- ** We require experienced staff to perform call duties. A worker coming here from another laboratory usually requires 3 months to be trained in our techniques to a level suitable for call duties. We have insufficient staff to allow this.*
- ** This scheme would be pretty will restricted to single men or women—in fact they specify staff technologists and we have only one, who spent 10 years in a larger hospital before coming here so benefits would be doubtful. I say single workers because married staff have working wives, or young families to consider and exchanges which might benefit this laboratory would probably inconvenience them greatly.*
- ** We like to keep up with the latest techniques but staffing constraints require us to what we're good at and send other work off. Staff coming back with bright ideas could develop ulcers with frustration.*

A good scheme, not convenient for this laboratory. We would be wiser to stick to our present system of sending staff off to larger centres to learn particular skills—as required, and welcoming locum workers (or just new staff) with their ideas picked up elsewhere."

"I refer to your Circular Letter 1981/52 and regret the delay in replying. The Board's Advisory Committee on Laboratory Services apparently met just prior to the receipt of your letter and did not meet again until just recently.

The Chairman of the Committee now advises that members indicated their support for the proposed exchange scheme. They did, however, express some doubt as to whether our Technologists would be interested in working in smaller laboratories.

It therefore follows that my Board may be in the position to offer the experience sought by Technologists working outside the main centres, but it would have difficulty in justifying its involvement in transfer expenses when there is some doubt about the degree of benefit out Technologists are likely to receive in return."

"The Board supports in principle the proposed exchange scheme but sees difficulty in its implementation. The Board resolved that its Charge Technologist's submissions on the exhange scheme should be forwarded to you and these are as follows:

'The exchange scheme proposed by the NZIMLT is an excellent concept and would be of extreme value to Laboratories of a similar size to our own. One of the major problems faced by smaller Laboratories is the academic and practical isolation experienced. As stated in the NZIMLT proposition attendance at seminars and conferences is of extreme value in this regard, but regrettably can only result in a relatively general information exchange. With the constant development of new and improved analytical techniques, we are under pressure to keep pace with these developments. It would be most useful to be able to have practical experience with new ideas before introducing them, thereby avoiding needless expenditure in assessing and setting up the procedure in this laboratory.

In practice however, I have a number of reservations:

1. *For a large centre to have say one staff member in 20 less than fully productive would not present a major problem; to have one of our six less than fully productive would have a significant effect on our work capabilities.*
2. *The problem of specialisation: Most senior staff in larger centres have specialised in one particular area of Medical Technology. In small centres, although having our ares of specialisation, (e.g. mine is Biochemistry), we must remain, so to speak "Jacks of all trades". To import a specialist, e.g. Microbiologist with no experience in other fields would present us with a major problem.*
3. *I imagine that a case could be put with relative ease by a small laboratory to visit a large one. I am not so certain that a visit to a small Laboratory from a large one to 'develop a better understanding, tolerance and co-operation between large and small units' would in fact be seen as sufficient justification for the expense involved. In general terms we have little else to offer the major centres, particularly as there is a continuous migration of staff from small to large'."*

"I refer to Circular Letter HBA 1981/52.

As the exercise is very similar to that proposed in the case of Medical Officers I asked the Superintendent-in-Chief to comment on the suggestion.

He has replied as follows:

'The objective of the scheme appears primarily to be for one person from a smaller centre to gain experience in new techniques available only in a larger centre. There must very rarely be a need for a person working in a larger centre to move to a smaller centre, although it is agreed that such experience could be of value and interest to the individual. So that any exchange will rarely be of an equal value and hence does not constitute a real exchange scheme.

It is agreed that the ideal is for the exchangee to be employed in a working capacity and not purely as an observer. If the person however is a true replacement as would occur in an exchange, then the exchangee will most likely have to do the routine work of the person he exchanges with unless the laboratory is overstaffed, which is unlikely in the present financial climate. WIth this commitment the exchangee will not be able to concentrate on the special fields of interest, and will not be able to gain full benefit of the transfer or alternatively will take an unnecessarily long period to gain the expensive sought. If is far more preferable for the person transferring for experience to be employed as a supernumerary who can be available to work in chosen fields and not as a true exchangee.

The expense in such a case will of course have to be met by the Board sending the person with such assistance in the way of accommodation etc that the host board may be able to provide.

The only justification I can see for an exchange is:

(a) Where the person cannot be released from the smaller unit without a replacement being provided and,

(b) Where a person in the larger centre wishes to gain experience in a small centre. In either case it will be necessary for the exchange to be made by mutual agreement between the laboratories concerned and then to seek the approval of the appropriate boards. The limitations as mentioned above of such as exchange must be accepted and need to be weighed by the Board in giving its approval. Here the expenses would have to be met between the boards by mutual agreement in the light of particular circumstances.

I trust these comments will be of some value."

"In reply to your letter of 14 April 1981, I wish to notify you that the Board supports in principle the proposed exchange scheme but would mention that it is unlikely to be able to implement the scheme until adequate financing is provided for the Board.

For that reason it is unlikely that the scheme could have any relevance this current financial year.

It is also considered that there are quite a few problems likely to be experienced in implementing the scheme as it is most unlikely that there would be an exchange of accommodation between the Technologists coming to the Board from a larger hospital and the one going up for the additional training. There is some doubt also that the major Boards would be willing to transfer a Technologist to the smaller Boards and it would end up with the Board having to pay accommodation costs for both the Boards own employee going away and for the person who was coming down or probably having to provide funds to pay for a relief person, while the staff member was away.

There is also some doubt that the Technologist coming from a larger Board would be as versatile as the Technologist in the smaller Boards as the larger Board Laboratories are much more sectionalised and the staff concerned would not get the variety of work they are likely to get in a smaller Board.

However, in spite of these possible problems the Board supports the scheme in principle."

"Your letter reference 5/6/11 of 14 April 1981, in which you sought this Board's comments on the proposed exchange scheme for medical laboratory technologists. The Board's Acting Medical Superintendent in Chief and the Chairman of the Board's Pathology Services made recommendations regarding the proposal which have been adopted by the Board's Finance Committee.

Briefly the comments made were that whilst some worth is seen in the proposed scheme, it is not felt that this Board, or indeed any of the larger Boards, would benefit from its introduction. It is, however, recognised that the personnel of smaller sized Boards might well be assisted to gain exposure to the wider loads of the larger Boards.

It could therefore be argued that the costs of any scheme intended to assist the smaller Boards should be met by the Board receiving the benefit; this would also encourage those Boards to give due consideration to alternative methods of updating their technologists' knowledge.

In general it is felt also that some domestic difficulties could be anticipated in straight exchanges of staff between metropolitan and smaller centres.

This Board advocates strongly the seconding of technologists from peripheral hospitals to major institutions and believes that such a practice avoids the difficulties and inequity which it believes to be inherent in an exchange scheme such as has been proposed."

"I acknowledge your Circular Letter HBA 1981/52 of 14 April 1981 and comment as follows:

1. Whilst not against the scheme we are certainly not enthusiastic.
2. We consider that the present system where selected personnel with a defined problem are attached or detached *as supernumerary to establishment* is preferable.
3. Some problems are:
   (a) A Specialist Technologist trying to cover a small general purpose laboratory and the non-specialised technologist trying to cope in a specialised area.
   (b) Experience gained on sophisticated equipment may not be relevant to the technologist's future needs.
   (c) It could be unpopular with married personnel especially with children—there is the matter of accommodation, schooling etc.
   (d) Too little is being made of the costs etc. of the scheme as against the benefits to be gained."

"The proposals for an exchange scheme for medical laboratory technologists has been studied by the Board and the following comments are forwarded as requested:

1. Does your Board support the proposed exchange scheme for medical laboratory technologists?
   In general yes. The opportunity of a secondment to another laboratory is seen as being a particularly useful way of gaining wider experience and a useful in-service training opportunity, when compared to other forms, such as conferences. This principle is already accepted for other professional groups such as medical staff and social workers.
2. Are there any changes your Board would suggest in the proposed exchange scheme?

   We have found very useful the opportunity of allowing technical staff to visit major hospitals to undertake specific courses of learning. A number of attachments for this Board's staff have been organised on an individual basis in the last year. We would hope to see the opportunity retained of being able to organise unilateral attachments for specific areas of experience to be undertaken.

   The one major change we would suggest in the proposal is that the minimum period not be stipulated as four weeks. There will be staffing difficulties in arranging exchanges where there is not the graded officer or staff technologist support within a department, to cover the prolonged absence of a graded head of department. We would need to be satisfied that an officer is able to act as second in charge for the period of absence. The composition of the graded establishment in our Board is such

that for domestic reasons, it would be impossible for the technologists to be away for a minimum of one month and up to three months, as suggested.

3. Any other relevant comments?
The usual domestic consideration of married persons being separated from families for a length of time, would apply. We do not see the suggestion that whole families could exchange to save costs, as being realistic or practical, particularly where children are at school. Also needing consideration would be the matter of additional charges for secondary accommodation of the secondment officer and it is obvious that these would have to be waived if the scheme was to succeed.

In summary, the concept of exchange appointments is supported provided the Board still has the opportunity and flexibility to make unilateral arrangements for individual staff to have attachments for specific purposes at other hospitals. Alternatively, we would suggest that the stipulated four weeks minimum period as suggested under the exchange scheme, is waived."

Study Leave

After a considerable correspondence dating back to September 1980 the following letter has been received.

17 March 1982

Mr B. Edwards
Secretary
New Zealand Institute of Medical
Laboratory Technology (Inc.)

Department of Health
53/67/3

Dear Mr Edwards,

Mr Harper called on me on 23 February to discuss the granting of part time study leave by boards to medical laboratory technologists.

The staff manual is presently being rewritten and it is intended to extend the delegation boards have on granting part time study leave. Boards would then be able to grant study leave to technologists where they considered it relevant to the persons employment.

Yours sincerely

M. J. Chapman
for Director Division of Hospitals

Extended hours of work, Cook Hospital

The Executive of the Cook Hospital has approached the NZIMLT to assist with negotiations with its laboratory staff over extended hours of work.

The Council of the NZIMLT wishes to thank the Executive of the Board for its expressed concern over this matter which has since been amicably resolved.

Assistance of the NZIMLT in local negotiations

Council will correspond with Boards at the request of members particularly in respect of changes to hours of work. Members should write to the Secretary.

First Home Mortgage Interest Rebate

See C.S.U. report.

Housing Corporation Loans: Hospital Sector

See C.S.U. report.

General Wage Order

The 9.2% General Wage Order and the changes to the Laboratory Assistants and Trainee scales have been circularised to all Hospital Boards. The letter and the determination are reproduced below.

CIRCULAR LETTER (INDUSTRIAL RELATIONS) NO 1982/35 12/May/1982.
Chief Executives of Hospital Boards.
Officer for Enquiries: Alan Medder.

Dear Sir/Madam,

Hospital Service Determination No DG 19—Laboratory Workers.

1. Hospital Service Amending Determination No DG 2256 is attached.

2. Following the withdrawal of a claim for increased salaries, from the Public Service Tribunal, by the NZ Institute of Medical Laboratory Technology (Inc), agreement has been reached to apply the general state adjustment to this Determination. This agreement has the effect of:

(1) applying the general state adjustment of 9.2% with effect from 10 November 1981 on all salaries apart from those specified in (2) below;

(2) freezing basic entry salary rates and interpolating an additional step in the Trainee and Laboratory Assistant scales, as a consequence of a Pay Research Unit Survey.

3. Special translation for those staff on the steps which have been frozen have been agreed to as a result of the pay research statistics, and subsequent negotiations between the Combined State Unions and the State Services Co-ordinating Committee. These translations will apply to all staff on these steps prior to **1 January 1982.**

(1) Employees in receipt of a salary of $5,318, $5,726, $6,475 or $6,995 as at November 1981 will receive a 6 months acceleration in their increment date. However, if the employees were on either salary step for more than 6 months as at 10 November 1981 they should be awarded a notional 6 monthly increment with payment of the increased salary rate to be effective from 10 November 1981 only (refer to appendix A for examples).

(2) Employees in receipt of a salary of $7,646 as at 10 November 1981 will translate at 10 November 1981 to the next salary step above $7,646 and retain their existing incremental date (refer to appendix A for examples).

4. Employees who have resigned since 10 November 1981, but who are otherwise eligible may be paid the increases where applicable on application to the board.

5. Cost
This will be met by way of a supplementary grant, and will be subject to the action outlined in paragraphs C127(19) (i) and C129 of Section C Finance, Manual of Hospital Administration.

6. Any matter of doubt or difficulty should be referred to this office for decision.

T. J. Neilson
for Director-General of Health

APPENDIX A

Example 1

An employee who commences with School Certificate on 1 September 1981 will translate as follows:

1.9.81 $6,995 commencement
10.11.81 $6,995 no increase
1.3.82 $7,646 6 monthly acceleration of increment with next increment due 1 March 1983.

Example 2

An employee who commenced on $5,318 on 1 April 1981 will translate as follows:

1.4.81 $5,318 commencement
1.10.81 $5,318 notional increment with next increment due 1 October 1982.
10.11.81 $5,726 payment of increased salary rate.

Example 3

An employee who commenced with University Entrance on 1 August 1981 will translate as follows:

1.8.81 $7,646 commencement
10.11.81 $interpolated rate (i.e. first salary rate above $7,646) and retains incremental date.
1.8.82 increment to the next step on the salary scale.

Example 4
An employee in receipt of a salary of $7,646 from 1 February 1981 will translate as follows:
1.2.81 $7,646 commencement.
10.11.81 $interpolated rate, and retains incremental date.
1.2.82 increment to the next step on the salary scale.

Example 5
An employee who commences with School Certificate on 16 December 1981 will translate as follows:
16.12.81 $6,995 commencement
16.6.82 $7,646 6 monthly acceleration of increment with next increment due 16 June 1983.

Example 6
An employee who commences with School Certificate on 2 January 1982 will translate as follows:
2.1.82 $6,995 commencement
2.1.83 $7,646 no accelerated increment.

Hospital Service Amending Determination No DG 2256
Pursuant to the State Services Conditions of Employment Act 1977, the Director-General of Health hereby makes the following amending determination.

Application of Amending Determination
1. Hospital Service Determination No DG 19 as amended from time to time, is further adjusted as follows.
2. The First Schedule Part A to Determination No DG 19 is hereby revoked and is replaced by the First Schedule attached hereto, which prescribes the following amendments:
(1) freezing basic entry salary rates and interpolating an additional step in the Trainee and Laboratory Assistant scales;
(2) applying the general state adjustment of 9.2% on all other salary rates apart from those specified in (1) above.
3. Replacement pages incorporating the amendments prescribed in 2 above are attached hereto.
4. This amending determination shall take effect on and from 10 November 1981.
Dated at Wellington this 10th day of May 1982.
R. A. Barker
Deputy Director-General of Health

FIRST SCHEDULE—PART A
SALARIES AND WAGES OF HOSPITAL LABORATORY WORKERS

1 Grade Laboratory Officer
A grade laboratory officer shall receive a yearly rate of salary from time to time determined in each case by the Grading Committee, that scale being one of the five following:

	11.6.81 $	10.11.81 $
5	25,801	28,175
	24,623	26,888
4	23,809	25,999
	22,810	24,909
3	21,996	24,020
	20,999	22,931
2	20,183	22,040
	19,368	21,150
1	18,463	20,162
	17,647	19,271

A grade laboratory officer may be paid a yearly rate of salary of $27,251 (11.6.81), and $29,758 (10.11.81) provided that advancement to this level shall be restricted by the Grading Committee to officers who either in terms of the criteria set out in Regulation 16 of the Grading Committee Regulations or on the basis of individual skills and achievement clearly merit a margin over other Grade 5 officers.
2. The scales of salaries applicable to laboratory workers other than grade laboratory officers shall be:

(1) Staff Medical Laboratory Technologist.

11.6.81 $	10.11.81 $
17,068	18,638
16,467	17,982
16,018	17,492
15,439	16,859

(a) The salary of a staff medical laboratory technologist being a person employed first as a trainee and then as a staff medical laboratory technologist shall commence on the first day of the month immediately succeeding the day on which was held the last part of the written examination, the passing of which together with the associated oral and practical examinations, whenever held, entitles him to his Certificate of Proficiency or other recognised qualification.
(b) Progression within the scale shall be by automatic annual increment.

(2) Trainee	11.6.81 $	10.11.81 $
	14,278	15,592
	13,746	15,011
	13,230	14,447
	12,844	14,026
	12,405	13,546
	11,590	12,656
	10,832	11,829
	10,097	11,026
	9,337	10,196
	8,506	9,289
	7,646	8,458
		7,646

Provided that:
(a) a trainee who holds a New Zealand Certificate of Science (Medical) or the Medical Laboratory Technologists Board Basic Training Certificate shall receive a minimum salary as from time to time advised by the Director-General of Health.
(b) the minimum salary rate (as advised by the Director-General of Health) for a trainee medical laboratory technologist who attains a N.Z. Certificate of Science (Medical) or the Medical Laboratory Technologists Board Basic Training Certificate shall commence on the first day of the month immediately succeeding the day on which was held the last part of the written examination the passing of which together with the associated oral and practical examination, whenever held, entitles him/her to the certificate.
(c) a trainee who holds a New Zealand Certificate of Science or the Medical Laboratory Technologists Board Basic Training Certificate, but does not attempt to qualify for the Medical Laboratory Technologists Board Certificate of Proficiency, will be reclassified as a laboratory assistant whereupon he may be paid according to subclause 2(4) of the schedule.
(d) a trainee who is a registered nurse shall receive the commencing salary of a second year trainee.
(e) a trainee may be paid a commencing salary higher than the first year salary, subject to the prior approval of the Director-General of Health, having regard to the age, educational qualifications, and experience of the person to be appointed as a trainee.

(3) Senior Laboratory Assistant	11.6.81 $	10.11.81 $
	15,057	16,442
	14,638	15,985
	14,221	15,529
	13,804	15,074

Entry to the senior laboratory assistants scale shall be restricted by the Grading Committee to laboratory assistants who hold an appropriate qualification and/or have achieved an exceptional level of competence in developmental or specialised service. Progression within the grade shall be by automatic annual increment.

(4) Laboratory Assistant

11.6.81	10.11.81
$	$
13,230	14,447
12,844	14,026
12,405	13,546
11,895	12,989
11,122	12,145
10,097	11,026
9,356	10,217
8,571	9,360
7,646	8,503
6,995	7,646
6,475	6,995
5,726	6,475
5,318	5,726
	5,318

The salary scale for laboratory assistant specified in subclause 2(4) shall be subject to the following general provisions:

(a) a minimum commencing rate of $7,646 (11.6.81) and $7,645 (10.11.81) for a laboratory assistant holding University Entrance in one or more subjects relevant to laboratory work.

(b) a minimum commencing rate of $7,646 (11.6.81) and $6,995 (10.11.81) for a laboratory assistant holding School Certificate (or entry to Form VI) or Endorsed School Certificate in one or more subjects relevant to laboratory work.

(c) notwithstanding (a) and (b) above, subject to the prior approval of the Director-General of Health, a commencing salary higher than the first year salary may be paid, having regard to the age, educational qualifications and experience of the person to be appointed as a laboratory assistant.

(d) subject to 'the prior approval of the Director-General of Health', special advancement may be granted to a laboratory assistant having regard to his special merit or responsibilities or educational qualifications attained.

(e) a laboratory assistant who obtains the "Certificate of Qualified Technical Assistant" and/or the "Certificate of Qualified Technical Officer" (issued by the New Zealand Institute of Medical Laboratory Technology) shall be granted a salary increment to the next step in the laboratory assistants or senior laboratory assistants scale (if any) on the first day of the month immediately following the date on which he completed the examination. Thereafter he will retain his present incremental date.

(5) Graduate Technologist

A graduate technologist shall receive a yearly rate of salary according to the scale of salary from time to time determined in each case on the recommendation of the board, with the approval of the Director-General of Health, that scale being one of the following:

(i) 11.6.81	10.11.81
$	$
20,134	21,986
18,924	20,665
17,760	19,394
16,599	18,126
16,018	17,492
(ii)	
15,439	16,859
14,858	16,225
14,278	15,592
13,746	15,011
13,230	14,447
12,844	14,026
12,405	13,546

The qualifying clauses have been omitted from the Determination, they are the same as in previous years.

MEMBERSHIP REPORT MAY 1982

Membership

	May 82	Feb 82	May 81
Membership as at 18th Feb	1446	1570	1446
LESS Resignations (5), G.N.A. (1).	6	164	31
	1440	1406	1415
PLUS Membership Applications (34) Reinstatements (4)	38	40	75
Total Membership	1478	1446	1490

Applications for Membership as at 5 May 1982

N. J. Alexander, Oamaru; T. J. Allan, Palmerston North; M. D. Beanland, Auckland; G. A. Bowers, Tokoroa; C. N. Bowden, Dunedin; S. I. Burblitz, Wellington; R. E. Burton, Te Kuiti; T. A. Campbell, Wellington; S. E. Cross, Dunedin; C. T. Gale, Hamilton; P. G. Hocquard, Palmerston North; D. Ionita, Auckland; F. S. Jackson, Palmerston North; T. Johnstone, Palmerston North; D. N. Knight, Palmerston North; P. Krishnan, Wellington; T. G. Langford, Palmerston North; C. Mercer, Auckland; W. M. Mitchener, Auckland; G. A. Patton, Dunedin; S. A. Perry, Palmerston North; L. E. Sampson, Hamilton; W. G. Shearman, Palmerston North; R. M. Taylor, Napier; A. Todd, Palmerston North; C. J. Tollemache, Auckland.

Applications for Associateship as at 5 May 1982

W. S. Butler, Auckland; L. A. Canterbury, Dunedin; S. Joyce, Christchurch; P. A. Metcalf, Auckland; B. J. Montgomery, Auckland; J. M. O'Brien, Auckland; M. C. Sinclair, Melbourne; D. A. Shumack, Auckland.

Resignations

K. Bramley, Auckland; F. Connelly, Christchurch; J. M. Fox, North Canterbury; R. M. Kovacevic, Wellington; B. McLean, Wellington.

No Forwarding Address

L. V. Murphy, Auckland.

OBITUARY

Dennis Francis Henry

Dennis Henry died suddenly at Tauranga on 6 February (Waitangi Day), having just arrived at work to start the Saturday microbiology.

Dennis commenced work as a technical assistant in Histology at the Waikato Hospital in the early 1950s. Deciding to apply for a traineeship there under the late Dr M. G. Somerville, he went to night school and obtained his University Entrance. From reference to the Association's Journal, it appears that Dennis was accepted as a junior member in July 1954, passing his Intermediate Examination in April 1958 and Final Examination in March 1960. Those of us that were at Waikato in the 1950s remember them as very happy years, and certainly we would acknowledge the part Dennis contributed in making them so.

In the late 1950s Dr Somerville moved to Tauranga to establish a private laboratory practice. A little later Dennis moved as well, becoming Charge Technologist at Norfolk Laboratory, now the Tauranga Medical Laboratory. At the beginning the staff numbered four, which meant that a "Jack of all trades" was needed, but in subsequent years the staff numbers multiplied, the capacity of the building doubled, Dennis assuming responsibility for the Microbiology and Serology departments.

Dennis developed his interests in music and the theatre while in Hamilton. He became a staunch and loyal member of the Hamilton Operatic Society, and later the Tauranga Choral and Operatic Society. He also played the piano, organ and oboe, and was for many years a member of the Tauranga Cantabile Singers.

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410 Hutt Road,
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Telephone 697-099. Telex NZ 31376

Christchurch,
P.O. Box 1813,
68 Orbell Street,
Telephone 63-661

Dunedin,
P.O. Box 1424,
80 Carroll Street.
Telephone 773-235. Telex 5794.

Dennis also had a dry and perceptive wit, readily seeing humour in most situations even at times when others would grumble, and could imitate other people, but never in an unkind way.

He is sadly missed by his colleagues, and our deepest sympathy goes out to his wife Catherine and their six children.

L.G.C., Tauranga
B.F.B., Hamilton
J.C.M., Palmerston North

FROM THE MINUES OF THE NZIMLT COUNCIL MEETING

Limited Registration

It was resolved that the letter from Mr S. Johnson regarding limited registration be received, and that it be referred to the Medical Laboratory Technologists Board with the suggestion that some of these problems could be overcome by changing the title "Limited Registration" to "Registration in (subject)".

IAMLT

It was resolved that the chief delegate when addressing the General Assembly of Delegates on the future role of the IAMLT indicate that this Institute would like to see a policy pursued relating to reciprocity, staff exchanges, aid and regional congresses.

Formaldehyde

It was resolved that the letter from the Department of Health regarding formaldehyde guidelines be received and the action of the Secretary and President nominating Mr J. E. Lucas as our representative be approved.

Journal Advertising

It was resolved that the Publication Committee establish an Advertising Sales Committee to sell advertising space in the Institute journal.

Laboratory Operations and Administration Syllabus

It was resolved that the amended syllabus for the Laboratory Operation and Administration Syllabus be approved and forwarded to the Medical Laboratory Technologists Board.

Education

It was resolved that the Medical Laboratory Technologists Board be requested to forward a report to Council on the progress to date on negotiations with Massey University.

It was resolved that the Education Committee clearly define the objectives behind the proposal to establish at degree course a Massey.

It was resolved that Mr C. Camphell be added to the Education Committee.

Rules

It was resolved that a notice of motion go forward to the Special General Meeting 'that Rule 13 (f) be amended by deleting the last sentence and substituting "The System to be employed for the election of Institute officers shall be the 'first past the post' system, conducted in accordance with 'Renton's Guide for Meetings and Organisations', 3rd edition, paragraphs 1112 (Returning officer), 1116, 1117 (voting), 1124, 1125, 1126, 1127 (counting)." '

It was resolved that a notice of motion go forward to the Special General Meeting proposing 'that Rule 6 (c) (i) be amended to read: "as Associates—(i) any person who is qualified for the Diploma in Medical Laboratory Technology issued by the Medical Laboratory Technologists Board, or whose qualifications are regarded equivalent by the Board." '

Overseas Aid

It was resolved that Miss M. Eales be reaffirmed as the NZIMLT representative on the Pacific Paramedical Training Centre's Management Committee.

It was resolved that sufficient funds be set aside to cover all expenses for Miss Eales to travel to Wellington to attend the Management Committee meetings.

Audio Visual Aids

It was resolved that an overdue charge of $10 per week per set be agreed to and that any borrower regularly sending sets back late forfeit his right to borrowing.

General Business

It was resolved that the NZIMLT write to the Medical Laboratory Technologists Board expressing concern at the increase in annual licensing fees from $8 to $20 and the short notice for paying them.

Committee for the review of Primary Medical Services

The Council of the NZIMLT has made this following resolution.

It was resolved that the letter from the Minister of Health regarding review of primary and medical services be received and that the following submissions be made to the review committee:

"Although some technologists have made their own submissions it is the opinion of the National Council of the New Zealand Institute of Medical Laboratory Technology that the current practice of hospital and private laboratories should be continued.

However Council feels the mode of operation could be improved by considering the recommendations of the 1974 Board of Health Report on Clinical Laboratory Services. Also expenditure on private laboratories could be reduced by allowing registered medical laboratory technologists the right to claim directly on the Social Security Fund. This Institute is strongly opposed to any suggestions to contract the work of hospitals into the private sector."

EDUCATION

Massey Course

The Council of the NZIMLT is concerned that no reply has been received from the M.L.T.B. regarding the proposed Massey Degree Course.

Medical Biology NZCS Syllabus

The Science committee of AAVA has referred the Medical Biology Syllabus to a committee for further study.

AWARDS

Awards

The NZIMLT has awarded the following prizes for success in the 1981 Medical Technologist Board Examinations.

The prizes have been donated by companies who have an interest in Medical Laboratory Technology and the Awards Committee wishes to thank them for their generosity.

Clinical Biochemistry Part II—Mr P. J. Hill, Middlemore Hospital, $25. Prize donated by Roche Products.

Clinical Biochemistry Part III—Mrs D. Coburn, Palmerston North, $50. Prize donated by Watson Victor Ltd.

Haematology Part II—P. A. Jensen, National Womens Hospital, $25. Prize donated by Medical Supplies.

Haematology Part III—Miss R. Holmes, Dunedin Hospital, $50. Prize donated by Warner Lambert.

Immunohaematology Part II—Miss L. J. Anderson, Waikato, $25. Prize donated by Technicon Pty.

Immunology Part II—Mrs L. B. Ellwood, Auckland Hospital, $25. Prize donated by Hoechst Ltd.

Immunology Part III—Mrs R. M. Cottell, Hamilton Medical Laboratory, $50. Prize donated by Hoechst Ltd.

Microbiology Part II—Miss L. M. Taylor, National Womens Hospital, $25. Prize donated by Smith Biolab Wilton.

Virology Part II—Mrs R. E. Jenkins, Dunedin Hospital, $25. Prize donated by the NZIMLT.

Ortho Diagnostic Systems Educational Award

The following letter has been received from Ortho Diagnostics.

ORTHO DIAGNOSTIC SYSTEMS
Gentlemen:

We are pleased to enclose a supply of applications for the 1983 Ortho Diagnostic Systems Educational Award.

Will you kindly make these documents available to your members who are interested in applying for the Award. As you will note, the deadline date for receipt of all applications by the IAMLT Executive Office is November 1 of this year.

For your information, the winners of the 1982 Ortho Diagnostic Systems Educational Award are:

Vilma Pausch	—	Austria
Abubakar Babandi	—	Nigeria
Ann-Marie Dahlberg	—	Sweden

It is a pleasure and a privilege for Ortho Diagnostic Systems to provide these opportunities for medical technologists worldwide to enhance their knowledge and expertise in immunohematology.

Sincerely,
William L. Mayer, 16/4/82

Application forms are available from the Secretary of the NZIMLT.

THE ORTHO DIAGNOSTIC SYSTEMS EDUCATIONAL AWARD

PURPOSE

To further the education of qualified technologists who are members of the International Association of Medical Laboratory Technologists by sponsoring their attendance at a one-week Case Study Clinic or Applied Blood Banking Course, as described below.

CASE STUDY CLINIC

Program

These are intensive five-day lecture programs in which the resolution of blood bank problems is stressed.

Format

Case histories illustrating problems periodically encountered in the blood bank are presented. The class instructors guide the group discussion to the resolution of these problems. Other aspects, such as the genetic pathways of blood group systems, the chemistry of antigens, and the immunologic response, are discussed when related to a case. Evening assignments are given.

Topics

The program covers major topics of concern in the blood bank, such as: Problems encountered in ABO and Rh testing, Identification of antibodies, Cold agglutinins, Mixtures of antibodies, Clinical significance of antibodies, Use of blood components, Auto immune diseases, Idiopathic warm auto-immune disease, Cold agglutinin disease, Drug induced auto-immune disease, Significance of positive antiglobulin tests, Use of monospecific antiglobulin sera, Non-antibody problems, Investigation of transfusion reactions, Hemolytic disease of the newborn and its prevention, Interrelation of leukocyte antibodies and red blood cells.

Attendees

This program is structured for experienced blood bank technologists who want to improve their expertise in interpreting blood bank problems and expand their knowledge in blood group immunology.

APPLIED BLOOD BANKING COURSE

Program

These are comprehensive five-day programs which include lecture and laboratory sessions. Application of blood bank procedures to problem solving is stressed.

Format

Lectures make up the morning session. They are followed by an afternoon laboratory session to demonstrate the application of procedures to problem solving techniques. Evening assignments are given.

Topics

Included are discussions of: Antigen/antibody relationships, Antiglobulin testing, The significance of complement, Transfusion reactions, Antibody identification, Cold agglutinins, Mixtures of antibodies, Non-antibody problems, Auto-immune disease, Hemolytic disease of the newborn and its prevention. The laboratory sessions provide an opportunity to gain experience in: Problems encountered in ABO and Rh testing, Interpretation of controls, Antibody problems, Warm antibodies and cold agglutinins, Mixtures of antibodies, Use of absorption and elution techniques, Diagnosis of hemolytic disease of the newborn, Detection and quantification of feto-maternal hemorrhage, Investigation of transfusion reactions

Attendees

This program is designed for blood bank technologists and clinical pathologists who want to gain practical experience in laboratory procedures used in problem solving.

AWARD

All expenses involved in attending this program, including air transportation and living costs, will be paid by Ortho Diagnostic Systems Inc.

ELIGIBILITY

All Medical Technologists who are active members of the IAMLT and possess the prerequisite academic as well as professional experience to attend the one-week Case Study Clinic or Applied Blood Banking Course at the Philip Levine Laboratories, Ortho Diagnostic Systems Inc., Raritan, New Jersey, USA. Attendees must have at least two years' experience in blood banking. Because the courses are highly technical in nature and given entirely in English, a complete understanding of English is essential.

METHOD OF SELECTION

An Award Committee composed of members of the IAMLT, appointed by the President of that organisation, will be responsible for choosing the annual recipients.

HOW TO APPLY

Complete the enclosed application form and mail by no later than November 1 to:

IAMLT Executive Office
External Relations Unit
Liverpool Polytechnic
Byrom Street
Liverpool L3 3AF
ENGLAND

C.S.U.

3% Spending Cuts

The C.S.U. has produced a background paper explaining what it thinks are key points in the debate on the proposed 3% cuts in Government spending.

As the information made available to the public by the usual means has been of a trivial nature, serious students should read this paper, which is available from local C.S.U. representative or the Editor.

Transfer Expenses: First Home Mortgage Interest Rebate

1. In a letter of 15 April the SSCC advises:

"I refer to your letter of 10 March 1982 concerning the portability of the First Home Mortgage Interest Rebate.

As I advised you in November the SSCC has been consulting with the Department of Inland Revenue on this matter. The principles of the rebate have now been clarified.

The legislation which gave effect to the rebate clearly reflected the Government's intention that the rebate was to be available in respect of the first home only. Thus the sale or other disposal of a first home and the subsequent purchase of a second or more homes within the qualifying five year period will result in the taxpayer losing the benefit of the rebate. Also, to qualify for the rebate, an individual must **own** and **occupy** his/her first home. Therefore if an employee, for examply, transfers from Wellington to Auckland and then rents a home in Auckland and lets his/her home in Wellington, he/she is no longer eligible for the rebate. In short the Government measure places emphasis on first home purchases and not on the first five years of home ownership.

To consider increasing the quantum of the transfer grant payment to compensate employees who transfer for the loss of their eligibility for the rebate SSCC would have to contravene a clearly stated Government policy. Furthermore, insofar as SSCC is aware, employers in the private sector do not make any compensating payment of the kind proposed by the CSU.

The SSCC is therefore unable to agree to your suggestion for an increase in the quantum of the transfer grant.

Housing Corporation Loans—Hospital Sector

3. In a letter of 23 March the Minister of State Services writes:

"I refer to your letter of 17 February concerning the provision of housing loans to Hospital Service employees on transfer on the same basis as to other state servants.

In its letter of 12 November last, the State Services Co-ordinating Committee informed the Combined State Unions that the Government has deferred a decision on Hospital Service employees' access to loans pending an officials' report dealing more generally with loan assistance to all state servants on transfer. I am advised that the preparation of this report is well advanced and I have asked officials to ensure that urgency is given to its completion. A final decision on extending loan access to the Hospital Service will of course depend on the Government's being satisfied that all the ramifications of such an extension have been properly considered."

OTHER SOCIETIES

Recognition in Australia

Members are reminded that under the rules of the Australian Institute of Medical Laboratory Scientists a N.Z. Certificate of Proficiency in Medical Laboratory Technology gained after 1 January 1974, does not **enable** one to be accepted as a Associate of AIMLS. Affiliate member status only is offered.

EEC Decides on Graduates in the Lab

At its recent meeting in Utrecht, the Standing Representative Committee for Medical Laboratory Technology in the European Economic Community unanimously passed a resolution "That this committee encourages its member organisations to seek the development of university(s) or university equivalent degrees in medical laboratory sciences in addition to other routes of qualification of medical laboratory technologists".

The decision follows discussion by the committee, over several years, about different forms of qualification, including those currently followed in the various countries of the EEC, and improvements required for the future.

FORUM

Dear Sir,

Just who is fooling whom with this proposed degree course NZ J Med Lab Technol *36* (1) 20 (1982)? First of all students undertake to complete an NZCS para-medical taking three years part-time, then some of them will be "filtered-out" so that a "motivated" group will attend the proposed degree course. Having being filtered and suitably motivated they then spend two further years leap-frogging between a limited number of medical laboratory science subjects with tutors of possibly doubtful suitability, in some of the disciplines, to end up at the end of five years with a BSc of 102 credits (? points).

Perhaps the expert team of representatives who propose this course can answer the following points:

1. What will happen to the NZCS holders who have been refused entry to the degree course? There are already problems in the NZIMLT with laboratory assistants who have proved their worth; now we will see another group of laboratory workers who will be left out in the cold.
2. Assuming that the term "credits" is the same as points, why should someone take five years to do a pass BSc of 102 credits when they can do a BSc in the biological sciences in three years for 96 points.
3. Under the present registration system I would think an individual applying for registration, with the type of course being proposed, would be refused registration on the grounds of insufficient experience in some disciplines e.g. histology, immunohaematology. Will registration be automatic for those qualifying or will we find that the Medical Technologists Board might express reservations about representation after the course has started?
4. Will the credits gained be cross-credited for other degree courses, as 20 percent will, by Massey's definition fail the course. The student may well opt for an alternative degree, what would happen in this situation?

The NZIMLT does not require a BSc at any cost; it requires a well structured education system that has been carefully thought out for all laboratory workers and takes into account the laboratory requirements of the 1980s and beyond.

Yours sincerely,
M. Legge, 12/3/82

Dear Sir,

In answer to the points raised by your correspondent Mr Legge:

1. The filtering out process referred to in the education report in the NZIMLT Journal February 1982 relates to candidates who fail NZCS. There is no intention to build in restricted entry based on the quality of the NZCS pass mark.
2. A BSc degree at Massey University requires 102 credits. Some universities have a smaller number of credits or points but the content of each credit is slightly larger.

Advantages to the technologist of the proposed format over a three year degree course include:

   1. More attractive financially. Salary as opposed to bursary.
   2. High extramural content with only a total of 36 weeks attendance at university. This should be particularly attractive to laboratory staff already employed.

3. Lack of histology training has not barred technologists from registration in the past, why should it with the new course? The MLT Board would have to give the green light to the contents of the proposed course before it was accepted.
4. The question of the number of cross credits for students who opt for alternative degrees cannot be answered until syllabi are written. The NZCS component of the course would entitle students 36 credits for a BSc degree at most universities. Because of the special nature of the NZCS (medical science) Massey are awarding 48 credits towards the proposed course.

Yours sincerely,
A. F. Harper, NZIMLT Education Committee, 4/5/82

Dear Sir,

The essence of my recent letters is that there are many unanswered questions relating to the current proposed Massey course. I am attempting to raise such questions through the NZIMLT Newsletter as I feel that it is the most suitable medium for such points to be raised. With such a large change in position on education in the institute *all* eventualities need to be considered *before* any course is agreed to as it will ultimately affect our negotiations in the future. Something which is of relevance now!

I feel, and this is reflected in my letters, that the membership has been poorly informed in relation to possible degree courses and from what information has been either published or I have obtained by correspondence, I would construe that a reasonable proportion of the Education Sub-committee are poorly informed on educational options also.

When Paul McLeod (our NZIMLT representative) was down here recently I discussed education with him at length and he had not thought through any options or implications of system changes. The healthiest sign in any organisation is people questioning the system and their questions not only being heard but answered. The points raised in my letters are in response to what I read or hear, and I am prompted to ask certain questions. That should be the whole basis of our profession, statement, critical questioning (to the point of destroying arguments if necessary) and answers—then rebuild the statement. I would never consider that I have the answers to particular problems, in this case education, but no one or group has a monopoly on ideas. This is a danger with which the NZIMLT is faced, i.e. absolute faith in what the NZIMLT Education Sub-committee is doing is right.

The basic concept of a BSc as a qualification I would support. Contrary to some people I am not anti-degree. I am anti-capitulating all for the sake of the Massey "carrot". The Massey graduates I have spoken to in Christchurch see the proposed degree course as the various heads of departments at Massey maintaining their empires with little real interest in the problems related to Medical Technologist education.

We need to study our options very closely and their future implications, we may only get one chance. You may recall about two years ago Kevin McLoughlin and I submitted a paper to you "Education in the Eighties—A Discussion Paper on a Pathway for the Medical Laboratory Sciences" and was rejected on the basis that it did not offer anything new. Whoever refereed the paper did not appreciate what we were trying to do i.e. provide some positive options on education and attempt to promote comment. At that time the membership were "being sold" the Diploma course; despite this Kevin and I also considered other routes of entry including degree courses.

I would consider it incorrect to say that my letters are insufficiently researched as to write such letters requires careful consideration of how I will reply to any critics. This requires me to know most of the answers before I write the letters. The point about writing such letters is to attempt to raise the degree of awareness amongst the members. I note that those people who are willing to criticise either me or my statements are not willing to do it as an open argument so that the membership can assess whether the points/questions I raise are valid. Instead the critics prefer to hide behind the veil of anonymity and pick at things. Could it be that they cannot answer the questions or are uninformed on the points I raise, but experts on non-specific comment, or afraid of debating issues in public lest their arguments (facts) are shown to be poorly researched, ill-conceived or without basis? I have never, to my knowledge, made an incorrect factual statement in any of my letters, if I have then people have missed their opportunity. Could you tell me which of my letters or points are incorrect? Some of the questions I have raised, on the proposed degree course I do not have answers for as these can only be provided by those people responsible for negotiating the course and are, in my opinion, very important considerations. To this end it is the responsibility of the Education Sub-committee and they are, therefore, the people to criticise if it is necessary to argue about proposed systems.

Unity within the profession and more important, the NZIMLT, will not be maintained or strengthened by censorship. It may appear to work initially but eventually it will be very destructive. The people the NZIMLT needs will leave and the ones who have never really thought much further than "a few beers at conference" will be left. When I stood for President against Syd Shepherd people in some of the North Island centres campaigned against me and a spark glimmered in the Dunedin Branch. That event probably produced more unity than most in recent times, the most notable exception being the abortive telegram campaign.

Membership is falling, we must ask why? I do not believe that it is a financial problem; it is probably a philosophical one i.e. how does one identify with the NZIMLT, what are its policies on various issues, how does it handle its affairs, are members encouraged to participate, is it a tolerant organisation and so on. Unity can only be brought about by demonstrating some philosophical basis with which members can identify and relate to. In the final analysis the NZIMLT is a scientific organisation. Good scientists are unafraid of the truth, they have ideas, attempt to prove them and are prepared to either argue that their proof is correct, accept that although their idea may be essentially sound their "proof" does not support it and that other ideas may well help, or acknowledge that the idea was incorrect and look at it again.

The only safe approach is to let all see the light and to let all be discussed, experimented upon, vindicated or destroyed. It is the only way to understand scientific creativity and scientific progress. The NZIMLT needs this now probably more than any other time before.

Yours sincerely,
M. Legge, 5/5/82

Dear Sir,

I am a little disapppointed that Mr Legge has missed an important point on one of the main reasons for my visit to him and most other laboratories in the region. That is, I wanted to find out from the membership their opinions on various matters including education. My discussions with your correspondent were part of that exercise. For this reason, I find his comment about me to be self-contradictory, as I was foremost attempting to find out in my own way just what all the options, opinions and complications were that the membership had to offer

Paul McLeod, 26/4/82.

Pathology Department,
Wanganui Base Hospital,
WANGANUI

The Editor 28th May 1982

Dear Sir,

In reply to the two letters written by H. C. Potter published in the N.Z.I.M.L.T. Journal Medical Laboratory Technology April 1982, I would like to make the following comments:

1. Mr Potter states that membership was told that technologists with a BSc (Medical Technology) would have "increased status and vocational responsibility". I would be interested to have his reference.

   Summarising the advantages of the degree course in the N.Z.I.M.L.T. May 1981 newsletter and the 1981 Annual Report the statement made was "increased status and vocational respectability".

2. We currently have what could be claimed to be a two-tiered system viz. C.O.P. holders and science graduates with certificates of attainment who are entitled to registration as medical laboratory technologists in the disciplines relating to those certificates.

3. Reference to newsletters will show that membership has been fully informed of developments relating to the proposed degree course. In the July 1979 newsletter it was stated that financial constraints would not permit the proposed degree course at Massey to proceed in the meantime, however in the May 1980 newsletter membership was informed that "the unexpected availability of funds at Massey has revived the possibility of a degree course in medical laboratory technology. Dr Greenway is preparing a draft curriculum for our consideration".

4. The advantages of Massey University as a venue have already been published i.e. reply to Mr Kennedy's letter in the September 1981 newsletter. Mr Potter states that Massey may not be the best place for such a course; indeed from the correspondence appearing in recent newsletters this belief is shared by many of the membership.

   In fact in letters to the newsletter this view is shared by Mr Kennedy, Auckland Hospital Pathology Department, and Mr Legge and Mr Potter both from Christchurch Women's Hospital.

In summary what has happened officially regarding the proposed Massey degree course is as follows:

1. The concept of building a degree course into the N.Z.C.S. originated from Council. It was apparent that there were advantages in retaining the N.Z.C.S. which has served us well in the past, and developing a formal education programme for the final two years of study through Massey rather than introducing the proposed Diploma followed by block courses through a technical institute.

2. The Massey course concept was strongly supported by council who recommended to the M.L.T.B. that they ask Massey to put forward proposals for a degree course based on the N.Z.C.S.

3. The M.L.T.B. supported the proposal and a letter was sent to Massey by the Board asking them to proceed to develop a course structure and syllabi for consideration by interested parties.

4. To this end a workshop was held at Massey in October 1981 attended by nominees of the Board and Massey University staff. Details were reported in the February 1982 N.Z.I.M.L.T. Journal Medical Laboratory Technology. At the workshop a course format emerged but time did not allow for writing detailed syllabi.

5. A report on the workshop has been recently sent to the M.L.T.B. by the university. This report will be made officially available to council by the M.L.T.B.
   That is where we are at the moment.

Where do we go from here?

1. Further workshops will be held to write the syllabi—next one probably in June.
2. When the course structure and syllabi are completed they will be forwarded to the N.Z.I.M.L.T. Council via the M.L.T.B. The complete proposal will be widely circulated to membership for comment and criticism. This is the wish of Massey as well as the N.Z.I.M.L.T.
3. The complete proposal will then be examined by the N.Z.I.M.L.T. Education Committee who will make recommendations to Council taking account of comments received from membership.
4. The course will then be considered by Council who will forward their recommendations to the M.L.T.B.

It would appear that some Institute members have anticipated that the development of the course has proceeded further than is actually the case. When the proposed course structure and syllabi are completed and circulated everyone will be in a better position to make intelligent criticisms of the course. It would seem to be more sensible to wait until the facts become available rather than make comments based on supposition. It should be emphasised that Massey University is not interested in mounting a course which is not acceptable to the user group.

The N.Z.I.M.L.T. and the M.L.T.B. are not committed to a course which would be unsuitable.

Yours faithfully,
Alan Harper,
Convener,
N.Z.I.M.L.T. EDUCATION COMMITTEE

News from the Hill

A report compiled with the co-operation of the Public Relations Section of the Department of Health and the Public Relations Officer of the Minister of Health.

Hospital Board Financial Allocations: 1982/83

Hospital Board	Starting Point[1]	Total[2]
Ashburton	7,080,708	8,665,654
Auckland	218,177,167	259,919,030
Bay of Plenty	9,377,842	11,367,801
Cook	11,750,702	14,311,816
Dannevirke	3,754,269	4,613,234
Hawkes Bay	29,679,981	36,324,092
Maniototo	626,740	758,102
Marlborough	9,277,937	11,169,943
Nelson	28,123,938	33,050,610
North Canterbury	112,842,520	133,550,693
Northland	26,727,608	32,474,218
Otago	62,452,325	73,260,593
Palmerston North	50,136,883	61,293,347
South Canterbury	14,610,111	17,817,144
Southland	26,411,404	31,611,619
South Otago	4,478,305	5,474,576
Taranaki	25,816,183	31,555,663
Taumarunui	4,190,651	5,043,221
Tauranga	16,103,274	19,618,941
Thames	7,719,263	9,638,714
Vincent	1,876,031	2,286,865
Waiapu	1,502,254	1,808,866
Waikato	102,585,245	120,771,887
Waipawa	4,290,451	5,188,514
Wairarapa	9,161,313	11,762,606
Waitaki	4,615,726	5,638,064
Wanganui	15,180,814	19,645,614
Wellington	111,724,665	134,489,995
West Coast	15,651,795	19,064,216
Total	935,926,105	1,122,175,638

Notes: 1. Allocation after 1981 Supplementary Estimates.
2. Allocation as at 1 April 1982.

AMERICAN INSTRUMENTATION SHOW

Visit our major exhibition of catalogs, displaying instrumentation products from over 150 United States suppliers.
Equipment will include: scientific, laboratory, surgical, medical and optical instruments; x-ray and electromedical apparatus; electronic production and test instruments and parts; electronic computing equipment; process control instruments; environmental controls; physical properties test and inspection equipment, and many other instruments and parts.
In addition, Mr Peter Brennan—writer, consultant and recognised industry expert—will be present to answer questions about the products and discuss current trends in the instrumentation field.

Please come along—

On: July 15-16, 9.30 a.m. — 4.00p.m.
At: American Consulate General, 4th Floor, General Building, Shortland Street, **Auckland.** Telephone: 32-038.
On: July 19-20, 9.30 a.m. — 4.00 p.m.
At: American Embassy, 29 Fitzherbert Terrace, **Wellington.** Telephone: 722-068.

U.S. DEPARTMENT OF COMMERCE · INTERNATIONAL TRADE ADMINISTRATION · FOREIGN COMMERCIAL SERVICE

Board of Health Review

A reconstituted Board of Health will aim to rationalise and reduce in number the presently complex system of Health Advisory Committees, the Minister of Health, Mr Aussie Malcolm, said today.

He was commenting on the announcement in the Speech from the Throne that such legislation would be introduced this year.

"My objective is to provide a better basis for involving the private and voluntary sectors in the planning of health services, the setting of objectives and the determining of priorities.

"A reconstructed Board of Health will achieve this. It will also provide for better co-ordination between Advisory Committees, and improved utilisation of resources and expertise," he said.

This proposal is to do with the machinery of advice to the Minister, not with a regional organisation.

April, 7 1982.

Interim Primary Health Care Report Received

The interim report of the Primary Health Care Committee has been received by the Minister of Health, Mr Aussie Malcolm.

The report makes two recommendations:

1. "That as a matter of some urgency, the GMS benefit be increased".
2. "That if a prescription charge is to be introduced, or any other saving made in the primary health services area, a substantial part of this money be made available to increase the GMS benefit".

Mr Malcolm said he appreciated the speed with which the committee produced the interim report but that the areas to be studied were far broader than the two recommendations indicated.

"Although I will be considering these two recommendations, I believe the far more complex areas of primary health care will be covered in the committee's final report," he said.

31 March 1982.

INSTITUTE CALENDAR 1982-83

July 5	Nomination forms for the Election of Officers to be with the Secretary (40 days prior to A.G.M.).
July 24	Ballot papers to be with the Membership (21 days prior to A.G.M.).
July 31	Annual Report and Balance Sheet to be with the Membership (14 days prior to A.G.M.).
August 7	Ballot papers and proxies to be with the Secretary (7 days prior to A.G.M.).
August 7-8	Council Meeting—Christchurch.
August 9-13	South Pacific Congress—Christchurch.
August 14	A.G.M. and S.G.M.—Christchurch.
February 25	Closing date for enrolments for Fellowship Examinations.
July 5, 6, 7	Fellowship Examinations.

XV Pacific Science Congress Dunedin N.Z. February 1-11 1983. Full details from, Secretary General, 15th Pacific Science Congress, P.O. Box 6063, Dunedin, New Zealand. This congress includes a section on Public Health and Medical Science (Section L.). The section convener is Associate Professor F. A. de Hamel, Dept. of Preventive and Social Medicine, Medical School University of Otago. The preliminary programme for section L includes (1). The Ecology of Influenza Viruses; (2). The Nidality of Disease (diseases with an endemic natural source); (3) Metabolic Disease in the Pacific (Jointly with the section on Nutrition); (4) Environmental Carcinogens, Mutagens and Teratogens.

SCIENTIFIC MEETINGS

2nd Asian Pacific Congress of Clinical Biochemistry 19th-24th September 1982 at Singapore

Organised by the Singapore Association of Clinical Chemistry and held under the auspices of the Ministry of Health Singapore, Academy of Medicine, Singapore, National University of Singapore and the International Federation of Clinical Chemistry. The Congress is held at the Mandarin Hotel, Singapore and the official language is English.

Registration Fee before June 19th 1982 is for scientific participant Singapore dollars $320, after June 19th SD$360. Accompanying person SD$170 and SD$200.

Full details are available from:

The Congress Secretariat, 2nd Asian Pacific Congress of Clinical Biochemistry, C/- Singapore Professional Centre, 129 B Block 23 Outram Park, Singapore 0316, Republic of Singapore. Tele 2215417.

DISCOUNT

The N.Z.I.M.L.T. has arranged with Butterworths N.Z. Ltd for a discount of 20% of the list price to be applied to all purchases of books from Butterworths by N.Z.I.M.L.T. members.

When ordering books state that you are an N.Z.I.M.L.T. member and claim the discount.

CLASSIFIED ADVERTISEMENTS

Classified Advertising is received by the Editor P.O. Box 6168, Dunedin. The closing dates for 1982 are April 7th, June 2nd, August 4th, October 6th, December 1st. The rate is $5 a column centimetre.

VACANCIES

MEDICAL TECHNOLOGIST (Haematology) Medical Laboratory Wellington has a vacancy for a second-in-charge position in the above department. It would suit a Technologist qualified in Haematology or a senior laboratory assistant with several years post-QTA experience, especially in blood films.

This is a busy automated Department, with a Haemalog analyser.

Salary, responsibility and other conditions of employment will depend on qualifications and experience and will be discussed at interview.

Contact:
Mr E. Aitchison,
Medical Laboratory Wellington,
16 The Terrace,
Wellington.
Phone: 738-385

WANTED TO BUY

1. Vitatron AST 100 Automatic sample table
2. Vitatron 200; Lin/Log Printer

The above equipment doesn't need to be in working order

3. Any spare belts, tubing or printout paper would be acceptable.

Send details to Principal Technologist, Northland Pathology Laboratory, P.O. Box 349, Whangarei.

FOR SALE

N.Z.I.M.L.T. Badges

Lapel badges in the form of the N.Z.I.M.L.T. Microscope Logo are available from your N.Z.I.M.L,T. Regional Representative. The cost is $2. Cuff links are also available at a cost of $6 a pair. These are encased in resin.

POSITIONS WANTED

Medical Technologist (29) F.I.M.L.S. (Advanced exam in Blood Transfusion Serology) now seeking a suitable post in New Zealand. Comprehensive experience in all aspects of clinical Blood Transfusion. Eight years state registration in Britain, now registered by the New Zealand Board. References and curriculum vitae on request.

Carol R. Burke F.I.M.L.S. Kilgarth, 3 Academy Park, Airdrie, Lanarkshire, Scotland.

Medical Laboratory Technologist from Germany registration March 1981, seeks a position as a trainee in a medical laboratory in order to become eligible for N.Z. Experience in microbiology, clinical biochemistry, haematology, parasitology. Please contact S. Hillebrandt, Kasenbachstr. 38, 7400 Tubingen, West-Germany.

Boris Stojcevski, a medical laboratory technician from Skopje-Yugoslavija, is looking for a job as a laboratory technician. I have finished a Medical School for laboratory technicians and have 12 years experience in microbiology but I could work in bramatology and hematology too. I can send all the required documents about my education and past work, on your request.

Boris Stojcevski, Necotinska STR 32. 9100, Skopje Yugoslavia. Registration by MLTB Applied for.

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1 Lee, C L and Davidson, I: Serologic Tests for Infectious Mononucleosis, ASCP Commission on Continuing Education, 1972.
2 Lee, C L: Spot Test for Infectious Mononucleosis, Bull of Path, 1968.

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