Vol. 42 No. 4 November 1988

ISSN.0028-8349

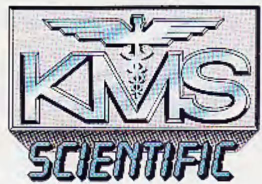
NEW ZEALAND JOURNAL OF

MEDICAL LABORATORY TECHNOLOGY

OFFICIAL PUBLICATION OF THE NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY INCORPORATED

Flow Laboratories

Worldwide reputation for quality in laboratory technology available to you in New Zealand from:



Kempthorne Medical Supplies Ltd

P.O. Box 1234, Auckland. Phone (09) 781-170 Freephone (09) 781-177

MPDK

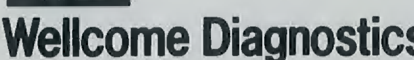
Helping you to protect the community.

The Wellcozyme range of diagnostic products is continually updated so you can protect the community more effectively.

Our tests for HIV antibody, Hepatitis B Markers, Herpes Simplex Virus and Rotavirus give you fast, accurate results.

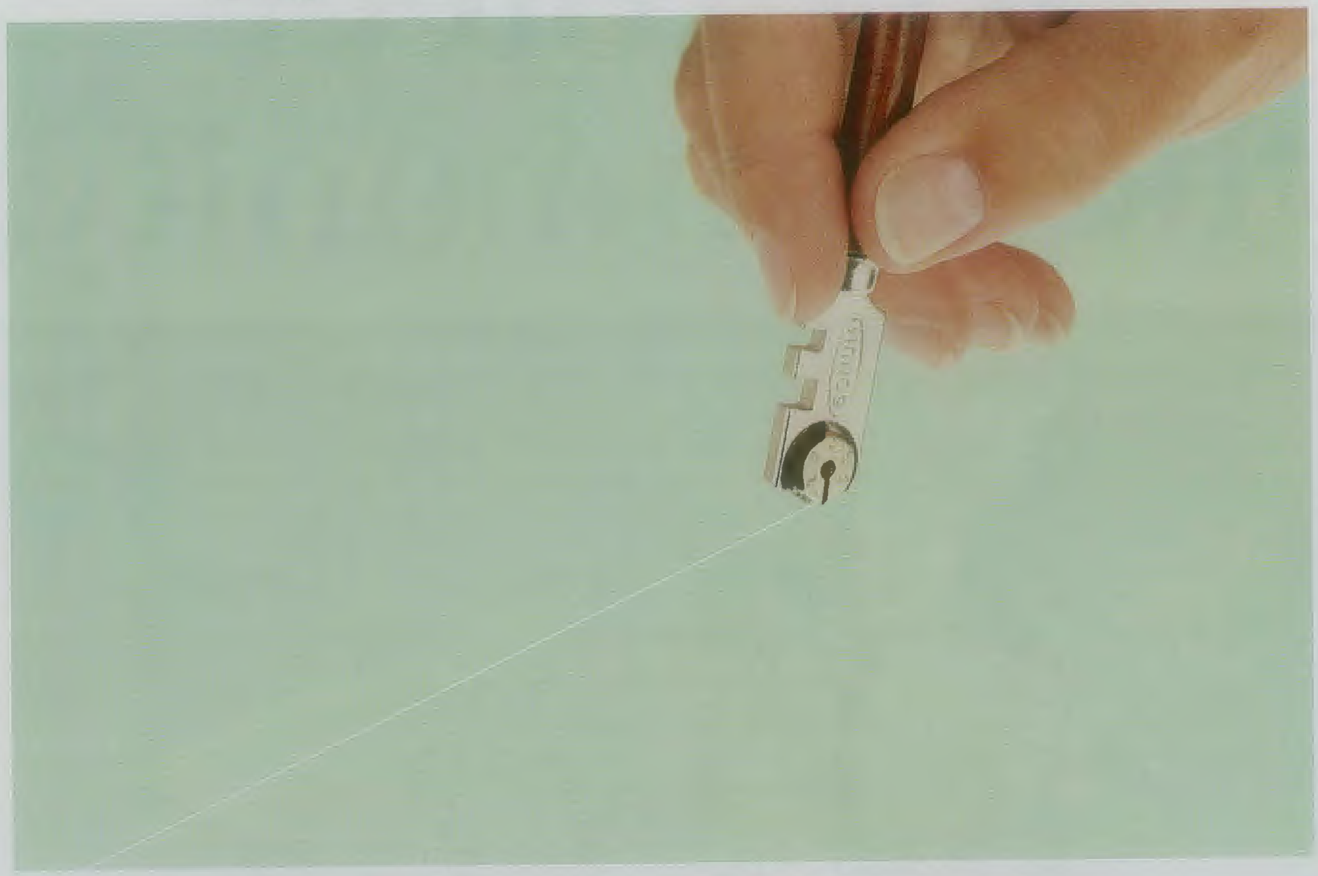
And now, our HIV Recombinant test is a further step forward in diagnostic technology.

Contact your local supplier for further information.



Wellcome New Zealand Limited, Auckland 6.

A clean cut – precise, rapid and simple RIA-gnost® hTSH coated tube from Behring



The drawing of clean cut divisions is a question of method. The method of choice leading to precise dividing lines in thyroid diagnosis is
RIA-gnost® hTSH
RIA-gnost® hTSH – a new two-site immunoradiometric assay (IRMA) employing monoclonal antibodies and using the coated tube technology – has been proven as a new milestone in the diagnosis of thyroid function.

Technical and Analytical Report
RIA-gnost® hTSH shows technical superiority compared to the hitherto available systems. The assay is rapid and easy to handle thanks to a short 2 hours incubation and to the convenient coated tube technology.
The sensitivity of RIA-gnost® hTSH is below 0.03 μIU TSH/ml because of the very steep slope of the standard curve, and of the low background count of the coated tube technology.
The IRMA method requires only one precision pipetting step, hence the precision within the assay and between assays was reported as excellent: The coefficients of variation are $<5\%$ over practically the entire measuring range.

Clinical Report
The very sensitive detection technique enables measurement of TSH concentrations in the range in which differentiation has hitherto not been possible.
In recent international clinical trials of RIA-gnost® hTSH clear cut-off values between hyper-, eu- and hypothyroidism by basal TSH determinations were demonstrated and led to a correct classification of thyroid status. RIA-gnost® hTSH is of proven value in the introduction of a new strategy for the diagnosis and monitoring of thyroid disorders which has a higher diagnostic accuracy and is more efficient and economical.

Behring Diagnostics
Hoechst New Zealand Limited
C.P.O. Box 67, Auckland
Phone 527-8068. Telex 2338

THE NEW ZEALAND JOURNAL OF
MEDICAL LABORATORY TECHNOLOGY

Vol. 42 No. 4 November 1988 ISSN 0028-8349

TABLE OF CONTENTS

Original Articles

Performance Appraisal — A Realistic Approach for Medical Laboratory Technologists
G.R. Elkin ... 108

Specimen Errors — A Chapter of Accidents
J. Parker ... 113

A Comparison of First and Second Generation EIA Methodology for Determination of Antibody to Human Immunodeficiency Virus-1.
P.M. Austin, I.W. Steed ... 116

Peritonitis due to Staphylococcus Epidermidis — An Epidemiological Study
R. Cursons, H. Tonks ... 120

The Pacific Way ... 122

Q.T.A. Examination Application Form ... 125

44th A.G.M. minutes ... 135

S.G.M. minutes ... 136

Wellington Branch NZIMLT Seminar ... 139

Presidential Address ... 145

Obituary ... 147

Errata ... 142
Letters to the Editor ... 143
Surplus Equipment ... 144
Institute Business ... 144
Work Wanted ... 149
New Products and Services ... 149

Subscriptions to the Journal for non-members requiring delivery in New Zealand is $NZ33.00 for 1 year surface mail paid. Single issues are $NZ12.00 surface mail paid.

Subscription to the Journal for non-members requiring delivery overseas is $NZ39.60 for 1 year surface mail paid. All subscriptions except for single issues are due in February.

DIRECTIONS FOR CONTRIBUTORS

From Vol. 36 No. 1 all papers published will be in the form known as "Vancouver Style" or Uniform Requirements for Manuscripts submitted to Biomedical Journals. Full details may be found in the New Zealand Journal of Medical Laboratory Technology, Vol. 42 No. 2, page 54 to 60 or from the Editor.

Intending contributors should submit their material to the Editor, D. Dixon-McIver, Biochemistry Laboratory, National Women's Hospital, Auckland, New Zealand, or The Editor, P.O. Box 35-276, Auckland 10, New Zealand. Acceptance is at the discretion of the Editor, and no undertaking is given that any article will be published in a particular issue. The copy deadline for each issue is the first of the month prior to the month of publication.

ADVERTISER INQUIRIES

Inquiries regarding advertising rates and copy or blocks for advertising should be addressed to the Advertising Manager, Trish Reilly, 48 Towai St, St Heliers, Auckland 5, Phone 555-057.

DATES OF PUBLICATION

The months of publication for 1988 are March, May, August and November.

This Journal is abstracted by: Biological Abstracts, Chemical Abstracts, Cumulative Index Nursing and Allied Health Literature, Current Clinical Chemistry, Hospital Abstracts, Institut nautchnoi informatsii.

Contributions to the Journal do not necessarily reflect the views of the Editor, nor the policy of the Council of the Institute.

Peformance Appraisal — A Realistic Approach for Medical Laboratory Technologists

G.R. Elkin, BA(Hons), MSc, PG Cert Ed, FBIM, FIIM, MIMP, MITD, AFNZIM.
Director of Advanced Business Programme, Otago University, Dunedin.

Part One — The Background

"Mene Mene Tekel Parsin" — (God has numbered the days of your reign and brought it to an end. You have been weighed on the scales and found wanting. Your Kingdom is divided and given to the Medes and Persians)(1).

When God appraised King Belshazzar it had dire consequences for him.

Many of us are wary of being involved in Performance Appraisal because we are sure that it will involve passing judgement on another, or have it passed on us and the judgement will be about our essential worth or value as a human being. Playing God or playing with someone who is playing God, is not an attractive pastime for most people.

This paper will discuss the possible benefits from appraisal. It will identify basic questions that need to be asked in designing a scheme. It will identify basic ways in which it can be carried out usefully and avoid the large degree of manager and subordinates resistance that can occur. It will take as a basic premise that appraisal is inevitable.

Appraisal — An Inevitable Opportunity

Appraisal of Performance is a fact of life in all but the most chaotic and unproductive environments. Managers often appraise their staff, informally on a day to day basis. It is a necessity for anyone who by Druckers definition is a manager. He defines management as "the art of getting things done through people"(2). To be effective in this role in a stable and relatively unchanging environment requires the efforts of subordinates to be directed and small changes of course made. In a dynamic world, the environment is continuously changing and so appraisal and setting of goals assumes an increased importance. It is also necessary to deal with the tiny failures (and the large ones) of discipline that occur from time to time.

Most managers accept this responsibility fairly easily and naturally. I suspect that the further away from the owner operator and entrepreneurial mode of enterprise we get, the less eagerly responsibility is accepted for the performance of subordinates.

The neo-private sector model of management that is emerging for the health industry is forcing senior medical laboratory technologists to come to terms with all sorts of new models and styles of management with increased accountability, authority and responsibility. When this has been grasped it will be seen to have been a tremendous opportunity and a re-energising experience.

All but the smallest of organisations have found that day to day appraisal needs to be supplemented by a more formal system, to allow for consistency and also to allow a more considered approach to how things are going. In other areas this is a common pattern.

Financial Budgets are often semi-annual with targets set on a 6 month or annual basis in addition to the regular review of achievement on a day to day basis. It is important not to see the formal longer term appraisal activity as a reason to abdicate responsibility for day to day appraisal any more than the existence of an annual marketing plan means that sales are only monitored every 12 months.

Appraisal for Individuals?

The U.K. Work Research Unit in their 1988 research paper claim it has its roots in three well substantiated psychological principles:

People work/learn/achieve more when they are given

(a) Adequate feedback as to how they are performing, in other words, knowledge of results
(b) Clear attainable goals
(c) Involvement in setting of tasks and goals.

They also remind us that the introduction of Performance Appraisal needs to be part of a participative corporate culture. Feedback without involvement in goal setting casts the appraiser in the role of judge and is counterproductive.

Put simply, an INDIVIDUAL needs to know:

1. What is expected of them
2. How well they are doing
3. What the future holds
4. That help is available
5. That their contribution will be rewarded fairly
6. Where the organisation is headed.

Appraisal for the Organisation?

There are substantial potential benefits to most organisations from introduction of a Performance Appraisal Scheme. Fig. 1 below is taken from the Institute of Personnel Management (UK)(3) 1986 survey of appraisal practice(4).

Although organisations have a variety of motives other than their belief that it is good for people; the chief ones are:

(a) to identify training and development needs
(b) to improve current performance
(c) to review past performance and to set performance objectives.

Only 40% regard it as a wage setting process.

Appraisal can be the centre around which the whole Human Resource Strategy operates. Appraisal can provide information for Human Resource Planning, Payment systems, Training and Development inputs, Succession Planning and other more peripheral areas.

Fig. 1 *Why Companies Review Performance*

	%
To assess training and development needs	97
To help improve current performance	97
To review past performance	98
To assess future potential/promotability	71
To assist career planning decisions	75
To set performance objectives	81
To assess increases or new levels in salary	40
Others — e.g. updating personnel records	4

Appraisal — How Widespread?

It is interesting to note, from the same 1986 report, that although 82% of employers did have schemes; less than 50% of public sector employers had schemes. It was also clear that it was not simply a question of size in determining whether or not a company had a scheme. In the period between 1977 and 1985 the proportion of 'staff' covered by a scheme rose in Britain from 2% to 24%.

Although no comparable data is available for New Zealand, it is likely that the proportions of enterprises with schemes will be even lower. Just as the U.K. report suggested that the number of public sector schemes was rising so the new State Owned Enterprises and the core Public Service are becoming committed to schemes.

The Public Service has, of course, been committed to the appraisal process for a number of years. The 1986 Public Service scheme is a model in its theoretical design. It has almost all the features experts argue for. Its chief difficulty is that it is so exhaustive that it is largely unused. Which illustrates that schemes must be cost effective, not just effective.

Appraisal — Resistance and Failure in the Past

As long ago as 1957, Douglas McGregor(5) wrote about the problem of manager resistance to carrying out appraisal despite apparently believing that appraisal is worthwhile.

He cites evidence that managers resist conducting appraisal, especially the interview component because they:

- Dislike criticising and arguments
- Lack the skill needed
- Are suspicious of new procedures
- Commonly distrust the instrument or scales used.

It would be possible to say that the world has changed in the last 31 years, and of course it has! However, the spread of appraisal schemes has continued and the difficulties remain. In fact there is an increasing pool of people who have experienced poor and destructive procedures. A feature of someone who has had exposure to a failed scheme; for which much was claimed and which delivered little; is a cynacism and reluctance to expose themselves again by serious participation in a new scheme. The resistance today comes not just from managers but from previously abused people. In his 1957 article, McGregor has this to say:

"The conventional approach, unless handled with consumate skill and delicacy, constitutes something dangerously close to a violation of the integrity of the personality. Managers are uncomfortable playing God"..

Why then, have men and women of goodwill with the interests of their subordinates, clients and organisations at heart, created such heartache and ill will?

There are a large number of pitfalls. Oberg(6), 1972, identifies 8 common pitfalls:

- We demand too much of the schemes and the individuals
- Standards and ratings vary
- Personal values and bias intrude
- Results are not properly communicated
- They are seen as performance panaceas
- Supervisors resist ratings
- Criticism can destroy existing performance
- Formal appraisals interfere with the attempts at coaching.

Many of the difficulties and failures come from a belief that appraisal is something done for organisations and to people. It needs to be something done for people and for organisations something done jointly for mutual benefit.

Part Two — Designing a Scheme for the 1990's

Appraisal — Essential Criteria

In considering an appraisal scheme it is important to initially address 5 possibly 6 major issues.

1. What we wish to achieve with the scheme
2. What we wish to measure
3. How we will measure it
4. Who will measure it
5. What we will do with the information
6. The general ground rules we want to see in the way we introduce the scheme.

Objectives

It is important to consider which are the most important outcomes we desire from the system. The three most common are a desire to:

1. Improve Current Peformance
2. Identify and Develop Potential
3. Ensure fair and Effective Rewards

Often these objectives can be to some degree mutually exclusive. For example, an open and frank discussion of performance and development needs is hard to achieve if at the end of the discussion it is well known that the amount of money to be paid will be decided. The dollar will tend to colour all the discussion. It may be wise to concentrate only on one of these objectives or to separate them in time if all three needs to be addressed.

What We Wish To Measure

The earliest attempts at measurement of people at work were essentially measures of family origin and wealth. With the beginning of meritocracy the measures became ones of personal characteristics . . . in the forces of . . . "Officer like Qualities".

Most modern practitioners and researchers have turned away from the assessment of personality traits for a number of reasons. The traits are ill-defined, hard to measure, difficult to discuss rationally with people and almost impossible to change. They tend to be a judgement of essential worth which is often resented.

The most successful schemes focus on behaviour and results. Emphasis is on items that can be measured objectively or demonstrated dispassionately. Results alone are insufficient due to the number of factors outside an individuals control which may affect results. In many appraisal situations we are interested in the behaviour of individuals which may contribute to results as well as results.

Rational discussion is more likely than with discussion of Personality. This is particularly so if the discussion is in the context of previously agreed targets and goals which can be quantified. The identification of Key Performance Factors or Key Results Areas is a crucial task in designing an appraisal scheme.

How We Will Measure It

There have been many schemes devised for measurement in appraisal, since the introduction of merit and competence as criteria for promotion and appointment in the British Civil Service nearly 200 years ago.

FREE FORM ESSAY

The earliest form of appraisal. Superiors are asked to write a report about the subordinate. Some guidance may be given to ensure some features are discussed in the report. They tend to be difficult to interpret and difficult to use for comparative purposes and have the additional difficulty of tending to be an assessment of an individual in total. Often this would be a personality based assessment and not shown to the individual. In many ways it is only a step from judgements based on good "breeding and family".

SCALES

These are an attempt to put numbers on a range of factors often to do with personal characteristics such as "energy", "initiative", "loyalty" or "relationships". Perhaps "quality of work" or "potential" would be added. The problem with scales are those of poor definition of what the terms mean and the difficulty of actually measuring the factors. Different raters produce different ratings. An attempt to standardise the ratings can be made, through the use of Behaviourally Anchored Rating Scales (BARS), which are fairly popular today in New Zealand.

BEHAVIOURALLY ANCHORED RATING SCALES

They attempt to add a description to each or some of the points on each numerical scale. For example a score of 10 may have a statement attached to it such as: "Always exceeds the most stringent expectations". 5 might be: "Meets reasonable expectations 90% of the time" and so on. Consistency between raters is improved by these schemes.

Some caution is required generally in the use of numbers. The addition of a number to anything does not make the scoring objective. The subsequent addition of several numbers to give an overall performance is even more dangerous.

It is possible to rate a Technologist on a whole range of factors including: relationships with others, speed of work and

throughput, hygiene of area of work and perhaps, technical knowledge — perhaps giving 5 scores of 9 i.e. 45 points. Unfortunately in terms of accuracy or reliability of work the score is 3! Overall performance excellent but the crucial elements very deficient.

CRITICAL INCIDENTS

This method is enjoying some use in New Zealand. It requires supervisors to keep records of the incidents, both encouraging and discouraging, which could form the substance of an appraisal discussion. It involves the keeping of a notebook or file on individuals which can be referred to at the appraisal time. The chief argument against this methodology is that, if the events are "critical" in performance, then they should be dealt with, then several months later it is not productive to bring them up again.

FORCED CHOICE AND COMPARISONS

There are several applications of this technique. They generally require the spreading of a group of people over a normal distribution for each characteristic, behaviour or for overall performance. An element of forced choice can be present in other schemes which force distinctions between above and below average without allowing average as a response. A further application is the use of a paired comparison technique which compares every individual against every other individual and ranks them.

Who Should Do The Measuring

The issue of who should rate individuals comes down to a choice of 5 options. The first is appraisal by superior alone, the second the individual themselves, the third a subordinate; the fourth by a group of equals and the fifth some combination of these. All have been tried in various situations and have merit. The choice comes down to the purpose of the appraisal.

A Performance Review is most commonly carried out by the immediate superior, on the grounds that they will be able to use and have a vested interest. Often this will be confirmed by the superiors superior in order to protect individuals and provide wide consistency. The Development or Training Needs Review may be completed with a "functional" specialist such as a Personnel Manager and the Reward Review by a more senior executive.

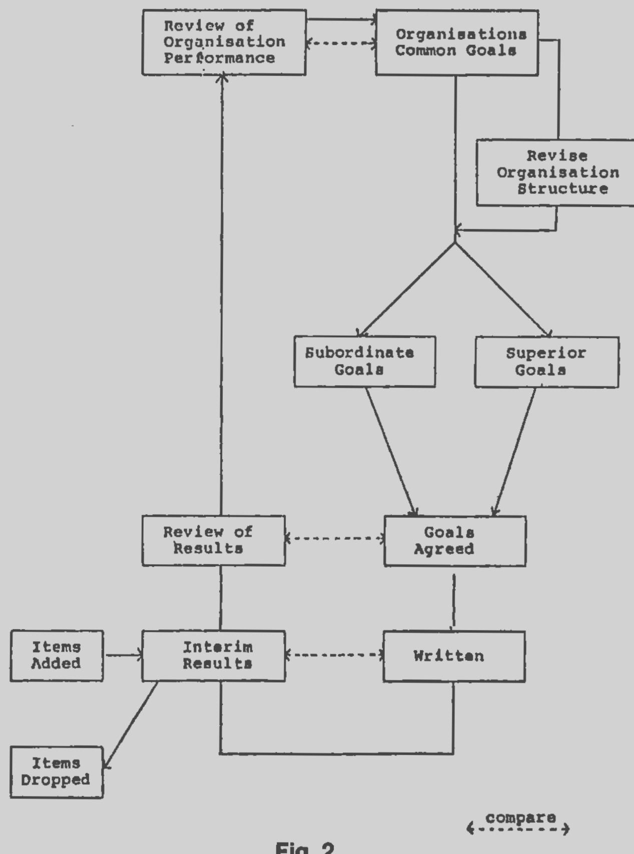


Fig. 2

What We Will Do With The Information

Experience has shown that attempts to introduce appraisal fail when information and outputs are sought and then not

Appendix 1.

"Management Guide" for Bill Walker, Shift Foreman for Nos. 1 and 2 Ovens (part only)

Key Result areas		Targets agreed	Results achieved
Quantity of output	a.	Maintain average output per productive hour (i.e. not counting maintenance stoppages) at 1.45 tons	1.395 tons (down 3.8%)
	b.	Increase yield from ingredients from 0.98 of standard to 1.00	0.997
Quality of output	a.	Increase average quality marking of inspected output from 7.8 to 8.0 (out of 10)	8.06
	b.	Reduce customer complaints attributable to shift from average of 1.05 per shift to 0.95	0.96
	c.	Reduce wastes and underweights from 2.5% to 2% output tonnage	2.05%
People management	a.	Reduce number of grievance and discipline cases referred to superintendent from 51 to 40	47
	b.	Reduce plant stoppage time due to undermanning etc from 5% to 4% of productive oven hours	
Safety		Number of accidents not to exceed previous year's 12	9

"Management Guide" is a term used in some of the packages which support MBO. It is part of the consulting outcomes from one appraisal and part of the input to the next.

used. Schemes which are launched with fanfares about the benefits and which then produce no action fail and are very hard to resurrect. No information should be collected unless it will be used. The collation of training needs information with no training and development activity carried out, will discredit the whole scheme. We must be committed to the use of data which individuals have given us and made themselves vulnerable in the process.

The Ground Rules

It is important to establish the nature of the appraisal exercise. If it is to be a joint problem solving occasion for the review of performance and the planning of the next period in terms of goals, action by the boss and the subordinates to correct, deficiencies and develop strengths, then it must be for real! The ACAS report(3) suggests that if individual development, openness and trust are important then schemes must among other things:

- use representative information
- use sufficient information
- use relevant information
- make honest judgements
- keep written formal appraisal documents and informal ones consistent.

The Contribution of Management By Objectives

The figure shows the process of Management by Objectives. It assumes that the individual, their boss and the organisation will benefit from the use of performance objectives that reflect the organisation's goals, are jointly set and regularly reviewed in the context of joint responsibility for their achievement.

Both parties prepare goals for targets they believe are important for the subordinate in the next performance period. Together, goals are agreed and action by both parties planned to ensure that they are achieved. This may involve planning, training and other action by the boss.

The goals are written with the action required and dates to be completed. They are reviewed regularly, informally and formally. A statement of the MBO type is in Appendix 1. The example is for a branch manager of an accounting practice.

Management by Objectives lies at the heart of many Performance Appraisal Schemes.

The Appraisal Interview

At the centre of any system of Performance Appraisal will be the appraisal interview. Many mechanically well designed schemes fail at the implementation stage because the managers are untrained at the task of conducting the face to face discussions. Of key importance in preparing to introduce an appraisal scheme is the training provided for line managers to help them cope. A simple format is in Appendix 2 which contains all the necessary parts of the process. The importance of the interview element is indicated by Tom Peters(7) claim. "The average employee takes six months to recover after a typical performance appraisal".

Part Three — Conclusions

Medical Laboratory Technologists, and those who manage them are likely to have increased accountability. With it will go increased need to function more in a managerial mode and to carry responsibility and exercise authority. The essence of management is the use and development of people. Performance Appraisal is a key tool — indeed an essential one!

A re-reading of the issues I have raised in Part 2 above will serve as a series of questions in thinking about the type of scheme that is appropriate to the profession, the institutions in which it works and the clients that are serviced. There is no simple package to buy that will do it all and the transplant of many prepackaged systems often causes rejection. It is not a difficult task to design a system that is appropriate for the particular situation. My belief that there is no one right way has lead me in this paper to raise questions that must be asked in developing an appropriate performance appraisal scheme and maximising the benefit from it.

I am always happy to talk to individuals and organisations about their problems and opportunities in this field.

Appendix 2.

A Structure for Performance Appraisal Interviews

BEGINNING

- Establish Purpose
- Review Terms of Reference — by use of Job Description, Targets or Objectives
- Review Last Appraisal

MIDDLE

- Review Achievements
- Compare Actual with Plan
- Determine Reasons for Difference
- Discuss Personal Development
- Consider the Needs of the Organisation

ENDING

- Summarise
- Action Plan — for both Boss and Subordinate
- New Targets/Objective and Dates
- Agreement

AFTERWARDS

- Make a copy of what was agreed for both parties

References

1. Daniel Ch. 5 v 25-28.
2. Drucker P. The Practice of Management.
3. James G. Advisory Concilliation and Arbitration Service Work Research Paper. Performance Appraisal 1988.
4. Institute of Personnel Management (UK) Survey carried out by P. Long 1986.
5. McGregor D. An uneasy look at Performance Appraisal. *Harvard Business Review.* May/June 1957.
6. Oberg W. Make Performance Appraisal Relevent. *Harvard Business Review.* Jan/Feb 1972.
7. Peters T. The no-win World of Performance Appraisal. Palo Alto. The Tom Peters Group 1985.

Appendix 3.

Guide to Performance Appraisal

Performance Factors	1. Far Exceeds Job Requirements	2. Exceeds Job Requirements	3. Meets Job Requirements	4. Needs Some Improvements	5. Does Not Meet Requirements
Quality	Leaps tall buildings with a single bound	Must take running start to leap over tall buildings	Can only leap over a building with no spires	Crashes into buildings when attempting to jump	Cannot recognise buildings at all, much less jump
Timeliness	Is faster than a speeding bullet	Is as fast as a speeding bullet	Not as fast as a speeding bullet	Would you believe a slow bullet	Wounds himself with bullets
Initiative	Is stronger than a locomotive	Is stronger than a bull elephant	Is stronger than a bull	Shoots the bull	Smells like a bull
Adaptability	Walks on water consistently	Walks on water in emergencies	Washes with water	Drinks water	Passes water in emergencies
Communication	Talks with Chairman	Talks with the Boss	Talks to himself	Argues with himself	Loses argument

The Change Was On November 1
Do You Know About The Change?

COAGULON

ALBUMIN and ANTISERA

Distributed By:

MED-BIO ENTERPRISES LTD.

P O Box 33-135
Christchurch
Ph (03) 381-020

P O Box 13-595
Auckland
Ph (09) 655-912

Manufactured By:

C.P.O. 1607 Auckland. Ph (09) 396-356

Specimen Errors — A Chapter of Accidents

Jan Parker, ANZIMLT, B.Sc., Dip. B.Admin.
Laboratory Services, Dunedin Hospital

Introduction

Silberman & Plaut(1) defined the areas in which errors can occur in the laboratory as being sample collection and identification, handling, processing, assaying and transmitting data to the clinician. Wilson(2) found that errors can occur at every stage from collection of blood to reporting of results. While there are numerous studies reported in the literature on the subject of errors in analysis(3,4,5) there is a complete dearth of information relating to specimen errors. Mass(7) defines the principal function of a clinical laboratory as being 'to provide meaningful data on the health status of patients'. This primary goal of assuring quality presupposes the data produced by the laboratory actually relates to the given patient.

Method

The laboratory concerned is a medium sized, largely automated clinical biochemistry department processing around 100,000 samples annually. Full records relating to sample problems have been kept for some years and this study represents the data for a one-year period from 1 June 1986 to 30 May 1987. It should be appreciated that the figures represent only those errors which came to the attention of the laboratory and the true 'blunder rate' may be considerably higher. In the area of identification particularly, staff outside the laboratory may be unaware or unwilling to admit that a mixup has occurred. Only in the case of gross anomalies will some errors be detected by checking procedures within the laboratory.

Results

The total number of sample errors for the one-year period was 400 from a total sample receipt of 98,980, giving a sample error of 0.05%. Chambers et al(6) in an examination of the blunder rate in a clinical biochemistry service quote a detected blunder rate of 0.3%. Their survey however specifically excluded errors detected before analysis or at the bench level.

There did not appear to be any strong relationship between the number of specimens being received in the laboratory and the number of specimen errors occurring (Table 1). A slight decrease in errors coincided with the Christmas period when activity in the wards is at its lowest point and the laboratory workload consequently diminished, but a larger decrease in May remains unexplained.

Table 1: *Laboratory Errors and Specimen Receipt over Time*

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Specimens Received	7695	7741	7506	7911	8336	7580	7069	6567	6315	8698	7679	7911
Errors Detected	34	38	34	43	39	40	29	30	43	29	34	17

Sample errors were divided into eight categories (Table 2).

Table 2: *Categories of Sample Error*

Category	Description	Number
1	Leaked specimen	33
2	No specimen	28
3	Faulty specimen	43
4	Needle attached	12
5	Unlabelled specimen	230
6	Inadequate identification	8
7	Misidentified specimen	38
8	Laboratory error	8
	TOTAL	400

Category 1: Leaked Specimens

Specimens in Category 1 were without exception urine specimens and the majority were from the psychiatric hospital. The containers used did not leak if the top was put on properly but obviously there was a knack to getting it right. Whether the fault lay with the patients or the nursing staff was not determined. Such specimens were discarded without testing and the ward informed.

Category 2: No Specimen

Category 2 consisted of request forms which arrived in the laboratory unaccompanied by a specimen although the ward or clinic was invariably certain that a specimen had been taken. There is always the risk in such situations that a specimen has in fact been taken and been labelled with specimens from another patient.

Laboratory phlebotomists are required to initial both form and specimen when bleeding patients which facilitates enquiries relating to mislaid specimens but this requirement does not extend to staff outside the laboratory. Laboratory policy is to notify the ward that no specimen has been received and request a replacement.

Category 3: Faulty Specimen

This category covered a wide range of errors (Table 3) all of which rendered the specimen unsuitable for analysis. In all cases the nursing staff were notified of the problem and a repeat specimen requested.

Table 3: *Types of Faulty Specimen*

Description	Number
Urine not acidified	10
Patient not fasted	1
Incorrect specimen	25
Specimen contaminated	1
Specimen haemolysed	2
Specimen aged	3
Incomplete collection	1
TOTAL	43

Category 4: Needle Attached

A major problem in medical laboratories is needle-stick injuries and it is of concern that blood gas syringes continue to be delivered for analysis with the needle still attached. After several laboratory staff had been injured in this manner the decision was made that such specimens would not be accepted. They are now returned to the ward unassayed.

Category 5: Unlabelled Specimens

Unlabelled specimens constituted the vast bulk of the errors detected (56%). Of the unlabelled specimens received 28% came from the Intensive Care Unit and 10% from Theatre with blood gases comprising 46% of all unlabelled specimens. The large number of samples involved makes the practice of returning them to the ward for labelling extremely dangerous. Considerable pressure may be exerted on laboratory staff to allow retrospective labelling and it is important that laboratory policy be clearly defined and

adhered to. In this laboratory such specimens are immediately discarded and a report issued stating that no identifiable sample was received. On the rare occasion when a sample is not replaceable the decision may be made, after consultation, to proceed with analysis. In such cases the report will be issued direct to the clinician involved as belonging to an unidentified patient.

Category 6: Inadequate Identification

Specimens with inadequate identification are normally processed and a report issued stating what are the minimum details required for adequate identification. In this laboratory the requirements are full name, date of birth and hospital number.

Category 7: Misidentification

Protocol for laboratory staff taking specimens is well laid down and rigidly adhered to (Apprendix 1). Following this protocol it would be virtually impossible to misidentify a patient. On the one occasion when a laboratory staff member was proved to be in error dismissal followed. A blood collection service is provided in the morning to all wards except the Intensive Care Unit. In this area, in clinics, and outside the defined times clinicians and nursing staff are responsible for the collection of specimens and this is where problems arise (Table 4). Misidentification is potentially the most dangerous sampling error that can occur and may have grave consequences for patient care. Evidence would suggest that the errors detected constitute only a portion of the actual misidentification which occur.

Table 4: *Misidentified Specimens*

Date	*Documentation*
7.6.86	3 specimens received with request form, one correctly labelled, other two labelled with another patient's identification
7.6.86	Tube labelled with surname only and invalid hospital number
23.6.86	Specimen from one of two twins labelled with mother's identification, unknown which twin was involved
24.7.86	Mismatch
28.7.86	Laboratory repeated tests to check a high Bilirubin and showed no abnormality. A checkup revealed two tubes bearing the same labels yielding different results
7.8.86	Mismatch
13.8.86	Pleural fluid misidentified. A specimen for analysis was obtained from Microbiology as their specimen was correctly labelled
14.8.86	Handwritten form with one identification on the top section and another on the specimen labels
15.8.86	Mismatch. A staff nurse rang to say she knew who had mislabelled the specimen and would we accept it
2.9.86	Mismatch
2.9.86	Sample tube labelled with two separate patient identification
2.9.86	Mismatch. Theatre in the middle of an operation and asked laboratory to proceed with testing on misidentified specimen
5.9.86	Request forms received for two patients, specimens all labelled for one of the patients
13.9.86	When laboratory issued phoned report the nurse stated that the blood was from baby X not Y
24.9.86	Patient request form received with insufficient data (name only) so it was returned to the ward. It was subsequently returned to the laboratory but the hospital number and date of birth entered were those of another patient
26.9.86	CSF received a.m. for patient X. Doctor arrived in the laboratory mid-afternoon to say CSF actually came from patient Y
24.10.86	Request forms received for two patients, specimens all labelled for one of the patients
28.10.86	Mismatch. Doctor had already realized his mistake and re-bled the patient
13.12.86	Form and specimen mislabelled. It was not noted how this error was discovered
1.1.87	Mismatch
8.1.87	Mismatch. The doctor concerned also sent 2 unlabelled specimens on babies within a 3-week period
21.1.87	Specimen labelled with two sets of labels
5.2.87	Form and specimen same label but patient had been discharged two days previously
6.2.87	Doctor labelled previously unlabelled specimen in laboratory as patient was for urgent surgery. Subsequent results appeared inconsistent
23.2.87	Mismatch
25.2.87	Ward rang to say result on one patient actually related to another
25.2.87	Mismatch. Doctor rang and admitted liability
26.2.87	Sample and form from theatre for patient X, operation known by laboratory to be on patient Y
7.3.87	Baby specimen labelled with mother's identification. Nurse allegedly too busy to label properly
10.3.87	Specimen labelled with two sets of labels
15.4.87	House surgeon came to laboratory and explained that sample from patient X actually came from patient Y
24.4.87	Laboratory considered result anomalous and contact patient who denied being bled
9.5.87	Mismatch
20.5.87	Staff nurse rang to say she had mislabelled a specimen
27.5.87	Mismatch
29.5.87	Wrong patient request forms in patient notes. A child with the same Christian name had been in the ward on a previous admission and his forms were subsequently used for this child
31.5.87	Specimens from twins both labelled twin II
N.B.	Mismatch refers to a request form and specimen received together but purporting to belong to two different patients

Table 5: *Laboratory Specimen Errors*

Date	Documentation
12.6.86	Patient results reported on wrongly identified result sheet
14.7.86	Patient results reported on wrongly identified result sheet
26.8.86	Specimens for two patients with the same surname mixed up at reception. Results noted to be inconsistent and report withheld
27.8.86	Amylase done by night staff repeated in the morning and anomaly discovered. Amended report sent out
5.12.86	Incorrect logging of patient results on computer
18.12.86	Patient given incorrect amount of glucatol for glucose tolerance test. Test stopped and samples discarded
2.4.87	Specimens for two patients with same surname mixed up on reception. Mistake discovered when anomalous result obtained for theophylline by which time other tests had been reported. Amended results issued.

Category 8: Laboratory Error

No chronicle of specimen errors would be complete without reference to laboratory errors (Table 5). In all cases these errors occurred as a result of protocol for identification and checking not being followed. Although laboratory related specimen errors only accounted for 2% of total errors they are potentially serious as clinical decisions may be made on the basis of results issued. Any anomalous result should be queried and if necessary checked before action is taken.

Conclusion

Mitchell(8) with reference to specimen collection stated that 'no result can be better than the quality of the specimen from which it was obtained'. There is an urgent need for quality control to be considered on a global basis within the hospital setting, not just as a laboratory related function. It is an unpalatable fact that as far as the patient is concerned there are a significant number of health care workers whose attention to quality control in specimen collection is virtually non-existent.

References

1. Silberman J & Plaut D. Quality Control in the Automated Clinical Laboratory. *Am Jour of Med Tech*, **49,** 4, April 1983, 213.
2. Wilson AV. Quality Control and Fault Finding in an Automated Laboratory. *NZ Journal Med Lab Tech* **26,** 1, March 1972.
3. Kilshaw D. Quality Assurance I Philosophy and Basic Principles. *Med Lab Sciences* (1986) **43,** 377-381.
4. Barrasso C. Complete Quality Control Requires Personnel Performance. *Lab World* Nov 1981: 45-48.
5. Kelly DT & ME. Proposals and Current Practices in Quality Control. *Am Jour Med Tech* (1981), **47,** 2: 957-965.
6. Chambers AM et al. The Blunder Rate in a Clinical Biochemistry Service. *Ann Clin Biochem* (1986) **23:** 470-473.
7. Mass D. Editorial. American Journal of Medical Technology (1981) **47,** 12: 952.
8. Mitchell FL. The Implementation of Quality Control and Factors Affecting its Success. *Ann Clin Biochem* (1969) **6:** 119-122.

Appendix 1: Collection Procedure for Blood Specimens

The safety of patients and the accuracy of laboratory work is dependent on the reliability of the staff who collect laboratory blood samples. The following procedure must be adhered to by all hospital staff collecting blood specimens. These steps will ensure that the venepuncturist does not make negligent mistakes which *do occur* with short cuts and may be fatal for the patient in the case of blood transfusions.

1) Identification

   a) Check that the identification forms have the correct identification and are identical. (Printing errors and misplacing of forms occur from time to time)). Ensure that *relevant* clinical data, tests requested, destination of the specimen, and address for the report have been entered. Separate forms are required for separate laboratories.

   b) Take the requisition forms and venepuncture equipment to the bedside. *ASK* the patient for his full name and date of birth and check against the data on the forms. *Under no circumstances should this information be supplied for the patient to confirm or deny.* This will ensure that the correct patient's forms are being used. If the patient is unknown to you and deaf or dumb or unconscious, the assistance of the senior nursing staff who know the patient may be necessary. The information on the identifying wrist band is helpful for confirmation and for checking the hospital number but is not always accurate.

2) Labelling and Collection

Place the identification label lengthwise on the tube and proceed to collect the specimen. With vacutainer tubes of less than 7ml volume the specimen must obviously be collected before labelling for practical reasons, but *must* be labelled before leaving the bedside. *Under no circumstances should the collector remove the unlabelled tubes from the bedside to the ward office or elsewhere for labelling, or request another staff member to do so.* Nurses have been specifically instructed to refuse to accept instruction to label blood specimens collected by medical staff.

Unlabelled specimens received in the laboratory will be discarded.

3) Check

The patient is again asked his full name and date of birth and this information is checked against the specimen tube label. A check against the wrist band data will be necessary for patients unable to answer. The collector should then initial the label. This confirms the identity of the blood specimen and will avoid the recurring problem of specimens being received with identification data of the wrong patient.

A Comparison of First and Second Generation EIA Methodology for Determination of Antibody to Human Immunodeficiency Virus-1.

Paul M Austin MSc(Hons), Ian W Steed ANZIMLT,
Diagnostic Serology Laboratory, Auckland Regional Blood Centre.

Abstract

Four commercial EIA methods for anti-HIV-1 detection were evaluated at the Auckland Regional Blood Centre (ARBC). It was determined that the methods gave different responses to a panel of 1000 blood donor sera, and, that the second generation EIA's of Abbott and Wellcome Laboratories possessed superior sensitivity as compared to first generation methodology.

Key words: sensitivity, specificity, anti-HIV-1, monoclonal, second generation, recombinant DNA.

Introduction

Blood donations have been subjected to anti-HIV-1 screening at the ARBC since October 1985. The initial 12 months of testing utilized a first generation EIA supplied by Electronucleonics Inc. (ENI). Many first generation EIA methods (including ENI) suffered high frequencies of false positive results, caused chiefly by cross-reactivity with antigens expressed on cells (commonly H9) used for viral propagation(1). The use of cell lines (CEM) not exhibiting DR4 cross-reactivity together with the adoption of a "competitive" assay principle enabled Wellcome Laboratories to achieve outstanding specificity with its method which ultimately led to the company tendering successfully for blood donor screening in New Zealand in 1986(2). Since this time, there has been increasing pressure on commercial companies to produce methods that are capable of detecting the earliest seroconversion. Two major outcomes of the search for increased sensitivity have been the advent of (a) monoclonal antibodies directed against HIV-1 and (b) the use of rDNA HIV antigens.

This paper details the findings of an evaluation comparing the monoclonal and polyclonal versions of the Wellcome Laboratories EIA methods, the Abbott Laboratories recombinant HIV-1 EIA assay, and an EIA supplied by Cellular Products Incorporated.

Materials and Methods

Blood donor sera

A total of 1000 randomly selected blood donor sera were collected and stored at -30°C prior to testing. Thawing was performed rapidly in a 37°C waterbath, followed by inversion, to allow mixing of the water and protein phases. Sera initially reactive (IR) by any method were re-tested in duplicate. If either replicate repeated as positive (RP), the serum was subjected to a confirmatory procedure [Western Blot] (WB).

Titration series

Two anti-HIV-1 WB positive sera [qualitatively strong (QS) and weak (QW) respectively] were diluted in normal human serum (NHS) negative for HBsAg, anti-HBs (radioimmunoassay: AUSRIA11 and AUSAB respectively; Abbott Laboratories, North Chicago, IL, USA) and anti-HIV-1 (enzyme immunoassay: WELLCOZYME HTLVIII; Wellcome Laboratories, Dartford, UK). Diluted sera were assayed by each test method in triplicate and end point titres (with respect to cut-off values) were determined.

Abbott Laboratories Sensitivity Panel

Abbott Laboratories supplied a 12 member non-heat treated panel comprising (a) a single anti-HIV-1 positive serum and (b) two seroconverter series. Volumes supplied did not allow duplicated analysis.

NSW Red Cross Panel 1987/2

Adequate volumes remained in the 20 member panel after quality control procedures had been satisfied to permit single determinations of each serum by all methods. The panel comprised 7 WB positive samples, three of which were in a duplicated dilution series, two in a non-duplicated dilution series and two being neat plasmas. Remaining members of the panel were (a) a plasma with an indeterminate WB profile and (b) a true negative, that was used as the diluent in the dilution series.

Commercial methods

The following companies submitted anti-HIV-1 test methods for evaluation:

1. Retro-Tek HIV ELISA (CPI) [Cellular Products Inc., Buffalo, NY, USA].
2. Abbott Recombinant HIV-1 (AREIA) [Abbott Laboratories; North Chicago, IL, USA].
3. Wellcozyme anti-HTLVIII (WELLP) [Wellcome Laboratories; Dartford, UK].
4. Wellcozyme HIV Monoclonal (WELLM) [Wellcome Laboratories; Dartford, UK].

In the CPI assay, pre-diluted serum samples are added to microplates coated with an inactivated viral lysate. Following incubation and washing phases goat anti-human IgG:ALP is added. After a second incubation/wash cycle, the addition of para-nitrophenylphosphate (pNPP), and enzymatic termination using 3N sodium hydroxide, the colour intensity produced is proportional to the concentration of antibody in the original serum. The AREIA assay differs chiefly from CPI in (a) the solid phase is a polystyrene bead coated with *E.coli* rDNA derived env and gag antigens (b) the conjugate is goat anti-human IgG:HRPO (c) incubation phases are shorter and (d) the substrate is [o-phenylenediamine.2HCl (OPD)], with 1N sulphuric acid for enzymatic termination. Both methods supplied by Wellcome Laboratories are "competitive" in principle whereby an antibody (specific to HIV-1) captures CEM propagated HIV-1 on to microplate surfaces. The addition of undiluted serum and anti-human IgG:HRPO results in competition for HIV-1 binding sites during an incubation phase. After washing, substrate [3,3',5,5'-tetramethylbenzidine] (TMB) addition, and reaction termination via 1N sulphuric acid, the colour intensity is inversely proportional to the concentration of anti-HIV-1 in the original sample. The monoclonal version of the Wellcome method differs from its polyclonal counterpart in (a) the HIV capturing antibody is of monoclonal origin (b) the sample/conjugate volume is increased (c) the concentration of TMB in the substrate is doubled and (d) there is no requirement for a 10% zone above the cut-off mean or a supernegative re-test value. These modifications were made with the intention of increasing the sensitivity of the method.

All methods were performed according to the manufacturers' instructions.

Statistical analysis

Blood donor sera

Each serum by each method had sample optical density/cut-off (S/CO) or CO/S [Wellcome assays] ratios calculated. Ratios were log transformed and means (Rx), standard deviations (Rsd), mean/standard deviation values (Rx/sd) and percentage co-efficients of variations (%CV) were calculated for each method.

Titration series

For each serum (QS and QW), all methods had linear regression (LR) analyses performed on those dilutions that had positive log transformed (≥1.00) S/CO or CO/S ratios. Using appropriate cut-off values, theoretical detection limit (TDL) titres for each serum by each method were calculated.

Results

Blood donor sera

All methods except WELLP gave calculated specificities of 99.8% after the screening of 1000 sera (Table 1). In order to distinguish between the methods, it is necessary to examine the performance of each method on individual serum samples. Those methods in a presumed negative population that have a large negative Rx, and a small Rsd (spread) would be preferable in that they would be less likely to produce false positives. This relationship can be expressed by the Rx/sd ratio, the larger the negative value, the higher the specificity. Graphical representation of the data (Figure 1) illustrates the variability in responses of the methods to the same panel of sera. Although AREIA had a large negative mean, its associated spread of values was large. In comparison both CPI and WELLM had over 70% of their ratios within a single size class. These distributions are reflected in the Rx/sd ratios, where, in order of increasing specificity, the assays would rank WELLP, AREIA, WELLM and CPI (Table 1).

We observed during the course of screening using the WELLM assay three sera (Table 2) that although were negative by the manufacturer's criteria, had optical density (OD) values that were at least 50% lower than mean negative OD's on respective microplates. All sera were within 10% of cut-off values. As an exercise these sera were repeated in duplicate, and two (472;774) were reactive by the WELLM cut-off criteria. Western Blot analysis determined these sera to be negative (Table 2).

Titration series

Regression analysis of titration responses of four commercial methods to two diluted WB positive sera (Figures 2 and 3) demonstrated that both Wellcome methods, despite occupying lower range titres than the CPI and AREIA assays, produced the most linear responses. With respect to the QS serum, there is presumptive evidence that at the lowest dilution factors, the CPI assay underwent a prozone effect (Figure 2). This assay also demonstrated an inability to titre out the QW serum (Table 3, Figure 3). Both AREIA and CPI assays produced much higher TDL titres as compared to the Wellcome methods. The monoclonal version of the Wellcome method displayed a greater than 50% enhancement in its ability to detect diluted antibody over the polyclonal version, irrespective of the strength of the original serum (Table 3).

Table 1: *Screening of 1000 blood donor sera by four commercial methods.*

	METHOD			
	CPI	AREIA	WELLP	WELLM
TEST PARAMETERS				
No. Tested	1000	1000	1000	1000
No. IR	2(0.2%)	2(0.2%)	10(1.0%)	2(0.2%)
No. RP	0(0.0%)	1(0.1%)	1(0.1%)	1(0.1%)
WB positive	NT	0	0	0
Specificity(%)	99.8	99.8	99.0	99.8
STATISTICAL ANALYSIS				
Rx	-0.66	-0.52	-0.19	-0.24
Rsd	0.10	0.16	0.07	0.05
Rx/sd	-6.60	-3.25	-2.71	-5.08
%CV	15.10	30.80	38.10	19.70

NT: denotes not tested

Table 2: *Production of abnormal OD values by the Wellcome Laboratories HIV Monoclonal assay.*

SERUM	S.OD	CO	CO+10%	xN	S.OD/ xN(%)	RT	WB
472	0.570	0.538	0.592	0.987.	57.7	+(1REP)	—
637	0.709	0.682	0.750	1.203	58.9	—	NT
774	0.734	0.682	0.750	1.195	61.4	+(2REP)	—

S.OD: denotes serum optical density
CO: denotes cut-off
xN: denotes mean negative optical density on a microplate
RT: denotes repeat testing
NT: denotes not tested

Abbott Laboratories Sensitivity Panel

All methods detected the single bleed antibody positive serum, however, the methods exhibited substantial differences in their ability to detect members of both seroconverter series (Table 4). In seroconverter series A (SCA), with respect to WB results, only WELLP failed to detect a positive sample, however in seroconverter series B (SCB), the performance of both CPI and WELLP were substantially inferior to those of AREIA and WELLM (Table 4).

NSW Red Cross Panel 1987/2

For all seven WB positive sera, both Wellcome assays achieved 100% sensitivity irrespective of any dilution factor (Table 5). The AREIA assay failed to detect the higher dilution of sample 2 however, in addition to this non-detection, CPI also failed to detect the higher dilutions of samples 3 and 4 and scored as positive only one of the replicates of the low

Table 3: *Theoretical detection limit titres generated by four commercial anti-HIV-1 methods following testing of two diluted WB positive sera (QS and QW).*

METHOD	SERUM QS	SERUM QW	QS/QW RATIO
CPI	33,221,815	294,379,208	0.11
AREIA	2,217,340	89,785	24.70
WELLP	8,299	463	17.77
WELLM	13,658	873	15.64

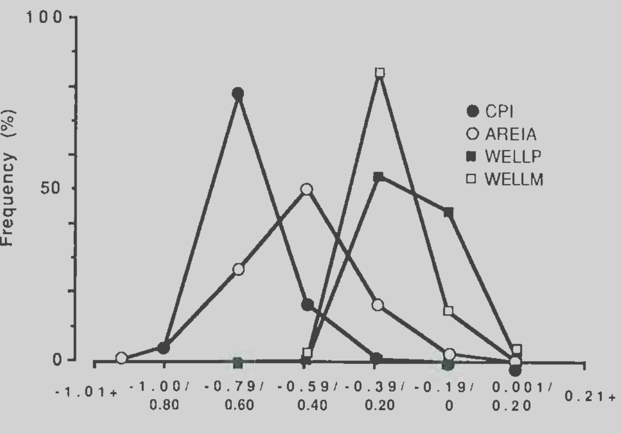


Figure 1: *Discrimination abilities for four commercial anti-HIV-1 detection methods following the screening of a panel of 1000 randomly selected blood donor sera.*

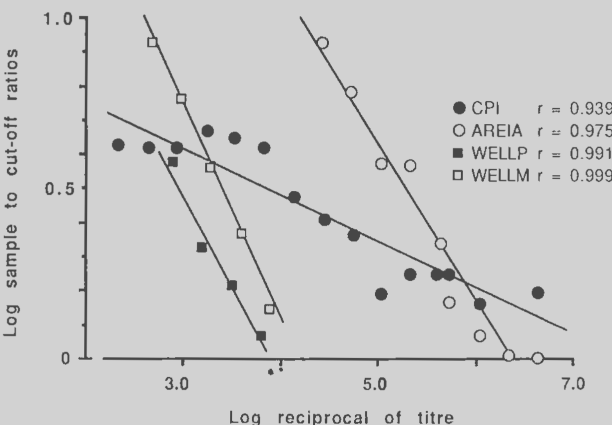


Figure 2: *Titration responses of four commercial anti-HIV-1 detection methods to a diluted QS WB positive serum.*

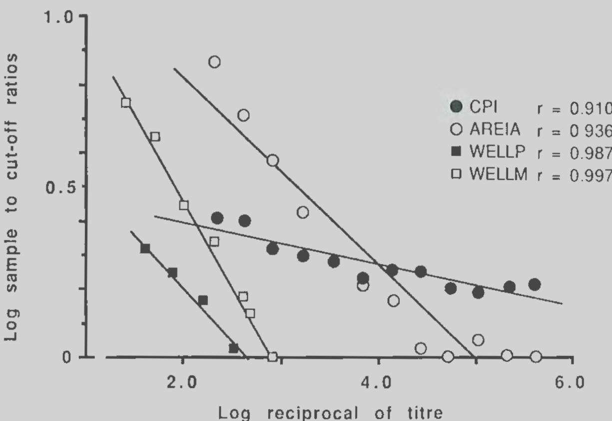


Figure 3: *Titration responses of four commercial anti-HIV-1 detection methods to a diluted QW WB positive serum.*

dilution from sample 2 (Table 5). The sample (8) with the indeterminate WB profile gave negative responses by all methods, as did the true negative sample (Table 5).

Discussion

It has been reported that variable latency periods exist before seroconversion in individuals infected with HIV-1, and that these may reflect the mode of acquisition of the virus(3-7). Antigen testing provides detection capabilities before seroconversion(4,8), although its usefulness in the presence of second generation tests has been questioned(9). Enhanced sensitivity, as claimed when second generation (rDNA and monoclonal antibodies) methodology is employed(9-12), is borne out in the present study where both AREIA and WELLM produced results on the Abbott sensitivity panel that were clearly superior to those of the first generation CPI and WELLP methods.

Dilution series data comparing different test methods must be carefully interpreted due to the varying titres of HIV-1 antibodies present at differing stages of infection(4-5,13), and the proportions of antigenic determinants in the viral isolates used for solid phase coating. This study however, presented an opportunity to compare two variants of the same method (WELLM and WELLP) and in all sensitivity aspects that were examined, the monoclonal version was consistently superior.

The assay supplied by CPI appeared to have two distinct problems of (a) not detecting antibody when it was present (Abbott and NSW panels) and (b) detecting antibody strongly in serum where levels would have been negligible (QW serum). The former problem is explainable in terms of a lack of specificity perhaps due to the viral isolate used, however, the latter is more difficult to understand, one possibility being that in the QW serum there may have been antibody activity present against a component of the test system, most likely the protein additive (BSA) in the sample/conjugate diluent. Supportive evidence for this hypothesis is that the AREIA assay which also uses BSA in kit components gave a poor correlation co-efficient value (r) in the QW serum but not in the QS serum. Conversely, both Wellcome methods, (neither of which use BSA) obtained good "r" values in the QW serum (0.987 and 0.997 for WELLP and WELLM respectively).

In blood donor screening, high specificity is as equally important as high sensitivity. At first inspection, all assays except WELLP appeared to have high specificity (99.8%). The lower specificity of WELLP (99.0%) can be attributed to either technical mishandling or reagent deterioration, as 80% of the IR's generated by this method were on a single microplate, and all were negative upon repeat screening. Analysis of the discrimination ability (with respect to a cut-off point) of the methods revealed that CPI and WELLM were the methods of choice by virtue of their tight distributions, although it is acknowledged that the dispersion of AREIA's

Table 5: *Performance of four commercial anti-HIV-1 detection methods on the NSW Red Cross quality assurance panel 1987/2.*

			METHOD			
SAMPLE	WB	D.F.(x10)	CPI	AREIA	WELLP	WELLM
1	+	d/-1.5	+(3.36)	+(>9.05)	+(11.57)	+(12.41)
		d/-2.0	+(2.74)	+(>9.05)	+(6.45)	+(9.62)
2	+	d/-3.0	*+(1.07)	+(1.62)	+(1.73)	+(2.68)
		d/-3.5	(0.47)	(0.66)	+(1.11)	+(1.40)
3	+	d/-2.5	+(1.58)	+(5.59)	+(1.69)	+(2.64)
		d/-3.0	(0.81)	(2.32)	+(1.04)	+(1.19)
4	+	NONE	+(3.48)	+(9.05)	+(6.52)	+(9.68)
5	+	-2.5	+(1.64)	+(6.69)	+(1.84)	+(3.11)
		-3.0	(0.94)	(3.45)	+(1.08)	+(1.39)
6	+	NONE	+(3.57)	+(7.29)	+(2.00)	+(4.67)
7	+	-1.5	+(1.96)	+(6.51)	+(1.40)	+(2.30)
		-2.0	+(1.09)	+(3.47)	+(1.00)	+(1.43)
8	IND	NONE	(0.90)	(0.53)	(0.77)	(0.64)
9	NEG	NONE	(0.22)	(0.15)	(0.74)	(0.57)

IND : denotes an indeterminate WB profile
d : denotes that the sample was analyzed in duplicate
D.F. : denotes dilution factor
* : denotes a +/- outcome between the replicates
( ) : bracketed values are either S/CO or CO/S ratios

Table 4: *Performances of four commercial anti-HIV-1 detection methods on an Abbott Laboratories sensitivity panel comprising two seroconverter series (SCA and SCB), and a single bleed of an antibody positive individual (SBP).*

					METHOD	
SERUM	BLEED DATE	WB	CPI	AREIA	WELLP	WELLM
SBP	NG	+	+(4.45)	+(9.40)	+(20.84)	+(16.47)
SCA1	22.04.86		(0.25)	(0.45)	(0.61)	(0.74)
SCA2	24.04.86		(0.25)	(0.52)	(0.58)	(0.58)
SCA3	30.04.86		(0.24)	(0.50)	(0.57)	(0.62)
SCA4	13.05.86	+	+(1.16)	+(2.54)	(0.78)	+(1.66)
SCA5	20.05.86	+	+(2.67)	+(7.04)	+(1.02)	+(3.05)
SCB1	16.07.85		(0.18)	(0.21)	(0.53)	(0.54)
SCB2	23.07.85		(0.18)	(0.77)	(0.53)	(0.64)
SCB3	25.07.85	+	(0.68)	+(2.22)	(0.49)	(0.63)
SCB4	30.07.85	+	(0.56)	+(2.44)	(0.62)	+(1.08)
SCB5	01.08.85	+	(0.68)	+(2.66)	(0.62)	+(1.20)
SCB6	06.08.85	+	+(1.27)	+(3.92)	(0.70)	+(1.49)

NG : denotes not given
( ) : bracketed values are S/CO or CO/S ratios

ratios may have been reduced, had fully automated processing equipment been available.

It is our contention that when screening blood donations using the WELLM assay, sera giving abnormally low OD values (with respect to mean negative values on a particular microplate) but above cut-off values will be generated. Our experience has taught us that these results are not the products of technical negligence as they often repeat as positive. While it is accepted that the provision of a 10% zone above the cut-off will cause a slight reduction in specificity (our data gives a figure of 0.3%), from a transfusion point of view this reduction is clearly acceptable given (a) the increased sensitivity of the method (b) the low frequency of abnormal OD generation and (c) the implications of using potentially infectious anti-HIV-1 units.

In conclusion, as all methods possessed similar levels of specificity (although CPI and WELLM would be less likely to produce false positives), the increased sensitivities as demonstrated by the second generation methods (AREIA and WELLM) singles them out as the preferred options. In order to choose between them, considerations of factors such as assay running time, cost, reagent life, the need for specialized processing equipment and compatability with current laboratory organisation must be made.

Acknowledgements

We would like to extend our thanks to Dr DG Woodfield, Dr RY Harding, and AG Benny, for their thoughtful comments; D Chapman for performing the Western Blot analyses; Abbott Laboratories for supplying us with a sensitivity panel; all of the participating commercial companies for supplying material for evaluation, and to CA Wilson for proof-reading and typing the final manuscript.

References

1. Kuhnl P, Siedl S, Holzberger G. HLA-DR4 antibodies cause positive HTLVIII antibody ELISA results. *Lancet* 1985; **ii:** 122203.
2. Austin PM, Steed IW. Comparison of the relative specificities of six immunosorbent assays for HIV-1 antibody detection. *NZ J Med Lab Technol* 1987; **41**(2): 44-7.
3. Esteban JI, Chang-Chih T, Kay JWD, Shih J W-D, Bodner AJ, Alter HJ. Importance of Western Blot analysis in predicting infectivity of anti-HTLVIII/LAV positive blood. *Lancet* 1985; **ii:** 1083-6.
4. Allain J-P, Paul DA, Laurian Y, Senn D and members of the AIDS-Haemophilia French Study Group. Serological markers in early stages of Human Immunodeficiency Virus infection in haemophiliacs. *Lancet* 1986; **ii:** 1233-6.
5. Grainer H, Sonnerborg A, Czajkowski J, et al. Antibody response in primary Human Immunodeficiency Virus infection. *Lancet* 1987; **i:** 1249-53.
6. Perkins HA, Samson S, Garner J, et al. Risks of AIDS for recipients of blood components from donors who subsequently developed AIDS. *Blood* 1987; **70** (5): 1604-10.
7. Ranki A, Krohn M, Allain J-P, et al. Long latency precedes overt seroconversion in sexually transmitted Human Immunodeficiency Virus infection. *Lancet* 1987; **ii:** 48-52.
8. Goudsmit J, Paul DA, Lange JMA, et al. Expression of Human Immunodeficiency Virus antigen (HIV-Ag) in serum and cerebrospinal fluid during acute and chronic infection. *Lancet* 1986; **ii:** 177-80.
9. Lelie PN, Reesink HW, Huisman JG. Earlier detection of HIV and second-generation antibody assays. *Lancet* 1987; **ii:** 343.
10. Oldham LJ, Mousdale HJ, Mortimer PP, Tedder RS, Morgan-Capner P. How sensitive are the commercial assays for anti-HTLVIII/LAV? *J Med Virol* 1987; **21:** 75-9.
11. Navarro MDR, Pineda JA, Velardo MA, de Pesquera FG, Lissen MLE. Recombinant EIA for anti-HIV testing is more specific than conventional EIA. *Vox Sang* 1988; **54:** 62-3.
12. Lelie PN, Reesink HW, Huisman H. Evaluation of three second generation and three confirmatory assays for antibodies to Human Immunodeficiency Virus. *Vox Sang* 1988; **54:** 84-91.
13. Goudsmit J, Lange JMA, Paul DA, Dawson GJ. Antigenemia and antibody titres to core and envelope antigens in AIDS, AIDS-Related Complex and subclinical Human Immunodeficiency Virus Infection. *J Infect Dis* 1987; **155** (3): 558-60.

Continuing Education:

SPECIALIST LEVEL MICROBIOLOGY STUDY GUIDE

Offered by Wellington Hospital Microbiology Department to those doing Specialist Level Microbiology in 1989.

This will: Suggest appropriate textbooks for the topics in the syllabus.

Provide journal articles and material from textbooks to supplement the above.

Provide references for additional information.

If interested, contact: **Shirley Gainsford, Microbiology Department, Wellington Hospital.**

Peritonitis due to *Staphyloccocus Epidermidis* — An Epidemiological Study

Ray Cursons PhD, Heather Tonks ANZIMLT
Department of Pathology, Waikato Hospital, Hamilton.

Abstract

Sodium dodecycl sulphate — polyacrylamide gel electrophoresis (SDS - PAGE) was used to differentiate 33 isolates of *Staphylococcus epidermidis* isolated from the peritoneal dialysis fluid (PDF), peritoneal catheter and different anatomical sites in a patient on continuous ambulatory peritoneal dialysis (CAPD) for chronic renal failure. The 13 peritoneal fluid isolates could be subdivided into 4 groups on the basis of their SDS - PAGE profiles. In contrast, most anatomical isolates had unique SDS - PAGE profiles, which differed markedly amongst themselves, and also from those obtained from peritoneal fluids. Two isolates from the Tenckhoff catheter were found to be identical to some of the previous peritoneal fluid isolates. SDS - PAGE was found to be useful for "fingerprinting" *S. epidermidis* isolates.

Key Words:

S.epidermidis, peritonitis, polyacrylamide gel electrophoresis typing method.

Introduction

Staphylococcus epidermidis is recognised increasingly as an important pathogen in those patients harbouring foreign bodies(1,2). Normally considered to be a saprophyte, and often regarded as an indication of improper specimen collection, its isolation can no longer be ignored automatically, particularly in infections of indwelling catheters, bacteremia in the neutropenic patient and prosthetic valve endocarditis. However, not all isolates of *S.epidermidis* are clinically relevant as it is an ubiquitous bacterium and is also the predominant organism of the normal flora of the skin. There is a need to distinguish between multiple infective and non-infective isolates. However, it is difficult to perform epidemiological studies because unique markers for this bacterium are difficult to find(1,2,3,4). Antibiograms, biotyping and phage typing are not specific enough as most isolates constitute a single large group. The use of plasmid profiles has demonstrated some usefulness but it is not without its difficulties (e.g. the tendency to lose antibiotic resistance plasmids, crypic plasmids)(5).

Prior experience using sodium dodecylsulphate polyacrylamide gel electrophoresis (SDS - PAGE) demonstrated its usefulness in "fingerprinting" strains of *Serratia marcescens*(6). This technique was applied in an epidemiological study of a patient undergoing CAPD in which recurrent and persistent peritonitis due to *S.epidermidis* was a feature.

Materials and Methods

Isolates of *S.epidermidis* were obtained as outlined in Table 1. These were cultured on 5% blood agar and identified by API-Staph. Single colonies were propagated in 10 mLs of tryptic soya broth overnight at 37°C. Cells were obtained by centrifugation and resuspended in 0.2mL of sterile distilled water. 0.1mL of lysostaphin (24 U dissolved in 50 mM Tris pH 6.8 containing 0.005 M $MgCl_2$) was added and the cells then incubated at 37°C for 30 min. Thereafter 0.5mL of lysing solution (2% SDS, 0.5% 2 - mercaptoethanol, 10% glycerol in pH 6.8 Tris) was added and the resulting soluble proteins dissociated by immersing the samples for 5 minutes in boiling water.

20 ȣ L of the SDS extract was loaded ito a 3% stacking gel and electrophoresed through a 7.5% resolution gel at 0.7 mm thickness as described by Laemmli(7). Electrophoresis was performed using a constant current of 10 mA for stacking and 20 mA for the resolution gel. At the end of the electrophoretic run, the gel was fixed in 30% ethanol - 10% acetic acid for 30 minutes and then in 30% ethanol - 10% acetic acid - 5% glycerol for 30 minutes. The gel was washed × in distilled water (10 mins each) and then silver stained according to the method of Peats(8). Prior results had shown that Coomassies brilliant blue R250 staining was too insensitive to differentiate between isolates.

Slime production of isolates was assessed by observing the sides of the culture tubes for production of slime after decanting the overnight broth culture. Such slime production was also associated with clumping of cells making the pellet extremely difficult to resuspend.

Results

33 isolates of *S.epidermidis* were cultured over the monitoring period of approximately 3 months before the catheter had to be removed. These were obtained from 5 episodes of peritonitis and from 6 different anatomical sites (Table 1). API profiles and antibiotic sensitivities of the isolates were similar such that the differentiation using only these parameters was not possible.

The initial isolate was treated blindly with Cefuroxime (250 mg intraperitoneally, [IP]) until the identification and antibiotic sensitivities of the isolate were established. Once these were know the antibiotic was changed to Vancomycin (2g IP). The peritonitis responded to the antibiotics but recurred 27 days later. Vancomycin was again introduced IP but this resulted

Table 1:
Sites from which S. Epidermidis was isolated

1. Peritoneal Dialysis Fluid (17/8)
2. Peritoneal Dialysis Fluid (12/9)
3. Nose Swab
4. Under-arm Swab
5. Abdomen Swab
6. Elbow Swab
7. Groin Swab
8. Nose Swab
9. Under-arm Swab
10. Abdomen Swab
11. Elbow Swab
12. Groin Swab
13. Peritoneal Dialysis Fluid (3/10)
14. Peritoneal Dialysis Fluid (3/10)
15. Nose Swab
16. Under-arm Swab
17. Abdomen Swab
18. Elbow Swab
19. Elbow Swab
20. Groin Swab
21. Peritoneal Dialysis Fluid (3/10)
22. Peritoneal Dialysis Fluid (24/9)
23. Peritoneal Dialysis Fluid (24/9)
24. Peritoneal Dialysis Fluid (6/10)
25. Peritoneal Dialysis Fluid (6/10)
26. Peritoneal Dialysis Fluid (20/10)
27. Peritoneal Dialysis Fluid (20/10)
28. Peritoneal Dialysis Fluid (23/10)
29. Peritoneal Dialysis Fluid (23/10)
30. Skin Exit Site
31. Skin Exit Site
32. Peritoneal Catheter Tube
33. Peritoneal Catheter Tube

only in a temporary resolution of the peritonitis. Three more similar episodes of peritonitis occurred, ultimately necessitating removal of the Tenckhoff catheter. The catheter subsequently grew *S.epidermidis*, only from the area adjacent to the perforated end. After removal of the catheter no more episodes of peritonitis were recorded.

Using SDS - PAGE the bacterial isolates obtained from the PDF could be subdivided into 4 groups on the basis of their individual electrophoretograms. Group A PDF isolates [1,2,13,14,21] were almost identical to Group B PDF isolates [22,23,24,25,28,29]. In contrast to this subtle difference, PDF isolates 26 and 27 differed from both groups A and B, as did 17 of the 18 isolates from the different anatomical sites. Isolate 20 was the only anatomical isolate with a gel pattern resembling the PDF isolates. On one occasion PDF isolates differing in their SDS - PAGE profiles were isolated from the same specimen [isolates 26 and 27]. Isolates 32 and 33 (from catheter tube) were found to be identical to the Group B PDF isolates. Finally, although isolates 10,16,18,20,30,31 produced sticky colonies, only those from the same site [30 and 31] were found to have identical SDS - PAGE profiles.

Discussion

Peritonitis remains the principle complication of CAPD(9,10). Although in many cases IP antibiotics alone eliminate the infection, in some patients recurrent peritonitis develops. The source of such recurrent infections has often been speculated upon and recently interest has focussed on the adherence of bacteria to peritoneal catheters as a possible focus of reinfection(1,2,10,11).

SDS - PAGE was able to discriminate between peritoneal and anatomical isolates of *S.epidermidis* in this study. This technique has been found useful in differentiating a wide range of bacteria and its usefulness in typing both *Staphylococcus aureus* and *S.epidermidis* was recently reported during the course of this investigation(12,13,14). This study confirms the usefulness of this technique in typing *S.epidermidis* but uses silver staining as an alternative to autoradiography. Staining with Coomassie brilliant blue R250 was found too insensitive to discriminate between staphylococcal isolates.

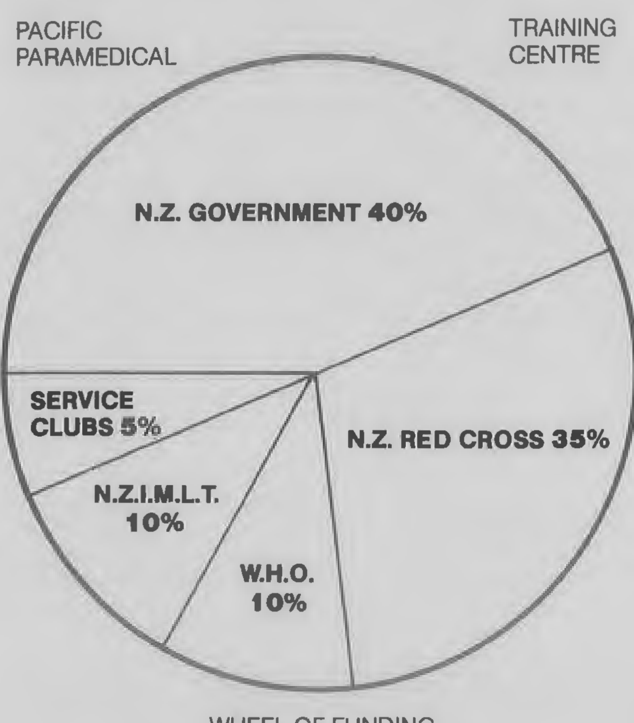
Our study supports the suggestion that a cause of recurrent peritonitis is colonization of the Tenckhoff catheter tube as the two bacterial isolates [32,33] from the catheter at removal were identical to those isolated previously from infected PDF. However, at least one out of the five episodes of peritonitis was due to a mixed infection of *S.epidermidis* strains. Based on their SDS - PAGE profiles at least 4 different groups of *S.epidermidis* were responsible for the peritonitis. Similar results have also been reported elsewhere(14). With the exception of isolates 26 and 27 all other peritoneal isolates had similar SDS - PAGE profiles which differed significantly from 17 of the 18 anatomical isolates. The significance of widely differing SDS - PAGE profiles from the different anatomical sites sampled may represent randomly selected strains from these sites. It appears that in the unhospitalized patient, enormous variation in *S.epidermidis* colonization from site to site on the skin is the rule.

References

1. Archer GL. *Staphylococcal epidermidis:* The organism, its diseases and treatment. In: Remington JS, Swartz MN, eds Current clinical topics in infectious diseases 5. New York: McGraw-Hill, 1984; 25-48.
2. Dunne WM, Franson TR. Coagulase- negative Stahylococci: The Rodney Dangerfield of pathogens. *Clin Microbiol Newsletter* 1986; **8:** 37-42.
3. Archer GL, Karchmer AW, Vishniavsky N, Johnston JL. Plasmid pattern analysis for the differentiation of infecting from non-infecting *Staphylococcus epidermidis. J Infect Dis* 1984; **149:** 913-20.
4. Christensen GD, Parisi JT, Bisno AL *et al.* Characterization of clinically significant strains of coagulase-negative staphylococci. *J Clin Microbiol* 1983; **18:** 258-69.
5. Parisi JT, Lampson BC, Hoover DL, Khan JA. Comparison of epidemiologic markers for *Staphylococcus epidermidis. J Clin Microbiol* 1986; **24:** 56-60.
6. Duggan TC, Leng RA, Hancock BM, Cursons RT. *Serratia marcescens* in a newborn unit — microbiological features. *Pathology* 1984; **16:** 189-91.
7. Laemmli UK. Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* 1970; **227:** 680-5.
8. Peats S. Quantitation of protein and DNA in silver-stained agarose gels. *Analyt Biochem* 1984; **140:** 178-82.
9. Grokal R, Ramos JM, Francis DMA *et al.* Peritonitis in continuous ambulatory peritoneal dialysis. *Lancet* 1982; **ii:** 1388-91.
10. Andrew J, Davidson A. Peritoneal dialysis. In: Hartwig N. ed Clinical microbiology update programme No. 17 ASM: May 1983.
11. Marrie TJ, Noble MA, Costerton JW. Examination of the morphology of bacteria adhering to peritoneal dialysis catheters by scanning and transmission electron microscopy. *J Clin Microbiol* 1983; **18:** 1399-98.
12. Jackman PJH. Bacterial taxonomy on electrophoretic whole-cell protein patterns. In: Goodfellow M, Minnikin D, eds Chemical methods in bacterial systematics. Soc for Appl Bacterial Tech Series No. 20 London: Academic press 1985; 115-29.
13. Stephenson JR, Crook SJ, Tabaqchali S. New method for typing *Staphylococcus aureus* resistant to methicillin based on sulphur - 35 methionine labelled proteins: its application in an outbreak. *Br Med J* 1986; **293:** 581-83.
14. Stephenson JR, Tabaqchali S. New method for typing coagulase-negative staphylococci. *J Clin Path* 1986; **39:** 1271-75.

Funding of the School

The New Zealand Government provides approximately 40% of the total cost of funding the Tutor Co-ordinator's salary and also by funding some students on the Bilateral Aid programme. The New Zealand Red Cross Society contributes approximately 35%. These contributions cover the cost of rental for the laboratory area from the Wellington Hospital Board, administrative services and a Health Science Award scheme for students. The N.Z.I.M.L.T. provides approximately 10% with contributions of textbooks and funding of the Quality Assurance programmes. W.H.O. provides a further 10% by funding student scholarships. Service Clubs (Rotary, Lions) and other organisations such as the New Zealand Federation of University Women and the New Zealand Country Womens League provide a further 5% by funding individual students to the courses. Funding from organisations such as these is to be encouraged.



WHEEL OF FUNDING

Personal contribution in terms of teaching and time cannot be evaluated in material terms. If this was to be quantified the slots occupied by the New Zealand Government and the N.Z.I.M.L.T. could be fairly exchanged in the diagram on the wheel of funding.

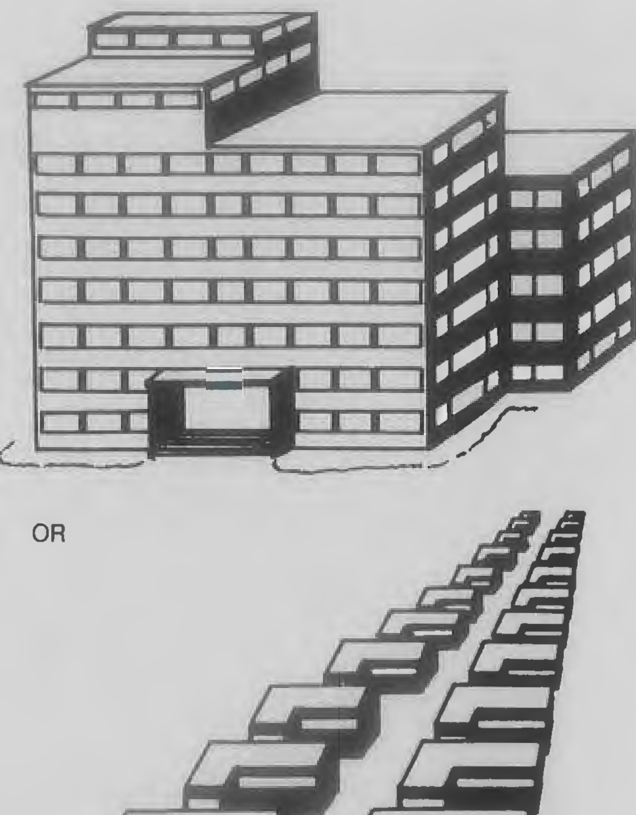
Role of Tutor Co-ordinator

The role of the Tutor Co-ordinator cannot be overemphasised. This person is the most important resource of the P.P.T.C. The Tutor Co-ordinator must be experienced in Medical Laboratory Technology. The Tutor Co-ordinator must have teaching experience and experience of working with people from third world countries. He/she must be prepared to give generously of time and to be prepared not only to listen but to help sort out all the problems that occur when students are adapting to life in a strange culture. The problems range from trying to get money from the bank, to organising air tickets home, to entertaining students on Saturday and Sunday etc. The school has indeed been fortunate to have both Andrea Hall and Michael Lynch as Tutor Co-ordinators. Both have played the many facets of the role of the Tutor Co-ordinator superbly. The P.P.T.C. would not be the success it is today without the efforts of these two people.

Eight years and 130 students later

Where do we go from here? The Centre must continue to develop but like a coral reef the development and growth should be on the outer edges. A sound training foundation has been laid down to which additions can be made as required. Whatever changes do occur however, the basic growth of the P.P.T.C. will remain the same. The provision of short term technical training programmes designed to meet the needs of each overseas trainee and his/her laboratory with an emphasis on appropriate and practical training that can be used immediately on returning home.

A 'disease palace' for doctors?



OR

Health centres and small hospitals for the community?

All the organisations that contribute to the Pacific Paramedical Training Centre are proud to be involved with it. The representatives of the various organisations have become involved in a very personal way and this wide involvement with other agencies has allowed not only a much increased capacity to meet important training needs but has brought together a range of skills, resources and contacts with operating partners that may not have otherwise been possible. It also would not have been possible without the specific needs of those very special people from the Pacific Islands with whom it has been our pleasure to work.

The above paper was presented at the 18th International Congress of Medical Laboratory Technologists at Kobe, Japan in July, 1988.

As the Wellcome Award Winner the author was chief New Zealand Delegate at the Congress and also co-author of a second paper presented at the Congress entitled "An Evaluation of E.S.R.'s in Pregnancy".

Minutes of the 44th Annual General Meeting of the New Zealand Institute of Medical Laboratory Technology held in Rotorua on the 31 August 1988 commencing at 4.15 pm.

Present

The President (Mr W Wilson) presided over an attendance of approximately 150 members.

Apologies

It was resolved that apologies be accepted for P Riddering, D Philip, H Stunzner and M Eales.

D Pees/I Buxton

Proxies

A list of 49 proxy holders representing 228 proxies was circulated to the meeting.

Minutes

It was resolved that the Minutes of the 43rd Annual General Meeting as circulated be taken as read and confirmed.

K McLoughlin/A Johns

Annual Report

It was resolved that the Annual Report be received.

B Edwards/P Huggard

Speakers on the Annual Report included P McLeod, B Tapper, J Parker, Dr C Lovell-Smith, C Cameron and A Watson.

During the presentation of the Annual Report Mr Wilson advised the Meeting that it had been a unanimous decision of Council that Mr Colvin Campbell be elected a Life Member of the Institute in recognition of his services to the profession. The announcement was met with acclamation. Mr Campbell responded.

It was resolved that the Annual Report be adopted.

B Edwards/P McLeod

Financial Report

It was resolved that the Treasurers and Financial Report be received.

D Reilly/T Martin

D Reilly spoke to the Financial Report.

It was resolved that the sum of $641.00 shown in the accummulative funds as Clinical Laboratory Special Funds be donated to the Medical Laboratory Science Trust.

A Harper/C S Shepherd

It was resolved that the Financial Report be adopted.

D Reilly/D Pees

Election of Officers

The following members of Council were elected unopposed:-

President	W Wilson
Vice-Presidents	D Dixon-McIver P McLeod
Secretary	B T Edwards
Treasurer	D Reilly
Auckland Regional Representative	G Rimmer
Wellingtion Regional Representative	S Gainsford
Christchurch Regional Representative	J Le Grice
Dunedin Regional Representative	J Parker

There was a ballot for the position of Central North Island Regional Representative:-

E P S Norman	44
M T Rees	21

Mr Norman was declared elected.

Presentation of Awards

The award winners were announced and the awards presented by the President:-

CERTIFICATE EXAMINATION AWARDS:	
Clinical Biochemistry	David Honey
Haematology	Lyn Graham
Microbiology	Michelle Petrasich
Immunohaematology	Frances Nicholls
Immunology	Paul Tustin
Virology	Gillian Hooker
Histology	Susan Johnson
Cytology	Sarla Naran
Nuclear Medicine	Warren Jackson
SPECIALIST CERTIFICATE EXAMINATION AWARDS:	
Clinical Biochemistry	Richard Finch
Haematology	Karen Taylor
Microbiology	Jane Beaven
Immunohaematology	Susan Jarrett
Cytogenetics	Angela Roigard
Histology	Lynda McPhee
Virology	Susan Billington
QUALIFIED TECHNICAL ASSISTANT AWARDS:	
Immunohaematology	Janette Overweel
Clinical Biochemistry	Monica Oughton
Haematology	Gillian Fry
General Certificate	Delwyn Stockdill
Medical Microbiology	Salaniata Elbourne
Histology	Karen Bowmer
Medical Cytology	Lynne Waller
Immunology (Microbiology)	Tania Scott
JOURNAL AWARDS:	
Travenol Dade Haematology Award	I Steed, R Anderson and P Austin
NZIMLT Journal Prize	G Verkaaik and P O'Hanlon
Roche Clinical Chemistry Award	Jan Parker
Best Trade Exhibit	Boehringer Mannheim Ltd

Honoraria

It was resolved that no honoraria be paid.

C Campbell/D Pees

Auditor

It was resolved that Deloitte, Haskins and Sells be elected as Institute auditors.

D Reilly/D Pees

Future Annual Scientific Meetings

The venue for the 1989 meeting was reaffirmed as New Plymouth and the President advised that two offers had been received for the 1990 Annual Scientific Meeting and that Council would investigate both offers and advise of its decision.

There being no further business the meeting closed at 5.15pm.

The International Health Department was subsequently able to persuade the New Zealand Government through the Ministry of Foreign Affairs to provide the salary of a Tutor Director for three years beginning in December 1980. The importance of obtaining an exceptional person to serve as Tutor Coordinator was fully recognised. The candidate must be actually or potentially competent in all areas of Medical Laboratory Technology. He/she must be able to teach both didactic and practical aspects of the field at a level which differs from that carried out in New Zealand. He/she must be able to overcome the difficulties that arise as a new project gets under way. He/she would be dealing with a number of agencies (the Department of Laboratory Services and the administration at Wellington Health, the Wellington Hospital Board, the New Zealand Department of Health, the New Zealand Ministry of Foreign Affairs, New Zealand Red Cross Society, officials from developing countries and other hospitals in New Zealand) and therefore he/she must be tactful and able to work effectively with others. A first hand knowledge of conditions in developing countries would be essential. It was seen that the Tutor Co-ordinator would not be working in a vacuum, as there was strong support for the facility from the Department of Laboratory Services at Wellington Hospital. Individual technologists had indicated their willingness to assist the facility by contributing their expertise.

Thus it was in 1980 with a lot of enthusiasm, goodwill and support from the New Zealand Government, the Wellington Hospital Board, The New Zealand Institute of Medical Laboratory Technology, The Red Cross Society, service organisations, etc., that the school was born. An inaugural meeting was held with representatives of all interested organisations, a Steering Committee formed and a search for the first suitable Tutor Co-ordinator was begun.

The Steering Committee (of the P.P.T.C.) believed that the facility should offer training in all aspects of medical laboratory technology including instrument repair. Instruction in basic subjects and in the fundamentals of medical laboratory technology would not be offered, thus the training would not duplicate that given in developing countries such as the Fiji School of Medicine, but would offer specialised instruction in response to special needs of the country. It was felt that the training of Pacific Islanders in New Zealand could at last be co-ordinated. Requests coming via the New Zealand Government, International Health or the New Zealand Red Cross Society could be channelled to the Tutor Co-ordinator who would arrange placement of a student in a suitable course or if felt necessary, place that trainee at an appropriate small laboratory within New Zealand.

In previous years New Zealand had sent medical laboratory technologists to developing countries under Aid and Volunteer Service Abroad programmes. Often these people were accustomed to sophisticated technology and usually ill-prepared to function under conditions present in the developing country. The proposed training facility could be used to familiarise such people before their departure with techniques that could be used in Pacific Island laboratories.

World Health Organisation was interested in the project and making encouraging noises about becoming actively supportive in the future. The World Health Organisation had recommended that training for Pacific Island laboratory people should take place at three levels.

1. A twelve month course for laboratory assistants which is carried out locally. The laboratory assistants are trained to a level which enables a variety of very basic tests to be carried out on remote, sparsely populated islands.
2. A three year certificate course. The basic technical qualification. This is available at the training schools in Papua New Guinea and Fiji.
3. Short post-graduate courses in specific topics e.g., water testing, tuberculosis, sexually transmitted diseases etc.

Level 3 is the level at which the Pacific Paramedical Training Centre planned to operate.

Donations to the School

The Steering Committee issued a list of equipment and teaching aids that were required to enable the school to function efficiently in the first year. The response to this appeal was most encouraging. Laboratories throughout New Zealand, both small and large, public and private, searched their cupboards and shelves and donated much of the required equipment. Rotary Clubs in New Zealand were very generous donating overhead projectors, a top pan balance, slide projectors and funding to start a library. There were some private donations from families who wished to remain anonymous. The New Zealand Red Cross Society was already contributing considerably towards the administrative costs of the school.

Donations of equipment from all these sources have continued throughout the years the school has been in existence. Last year, students who attended a laboratory maintenance course were each given a tool kit set from the Wanganui Rotary Club, a tool kit which would be the envy of laboratory technologists throughout the world. Equipment donations to the school over recent years have been sent to laboratories in Vanuatu, Fiji, Papua New Guinea and the Rewi Alley School in China.

Medical firms have donated reagents and medical kit sets for teaching purposes e.g., Wellcome N.Z. provided the reagent kits for the course on hepatitis and sexually transmitted diseases held in 1988.

Courses

Since the beginning of the school in 1981, the aim has been to introduce one new course each year. Courses which have been held at the P.P.T.C. to date:

Food and Water Technology Course
Blood Bank/Haematology Courses
Diarrhoeal and Acute Respiratory Diseases (this course in particular had the full approval and support from W.H.O. because these diseases are considered to be the major killers of children in the Pacific area.)
Maintenance of Laboratory Equipment
Clinical Chemistry
Hepatitis and Sexually Transmitted Diseases.

The school operates three courses each year of approximately three months duration. Each year a new course or an expansion of an existing course is introduced. Plans for future courses to be introduced include a course for tutors — teaching people how to teach.

The Students

Approximately 130 students have attended the P.P.T.C. since its inception in 1981. The majority of students have come from the following Pacific Islands: British Solomons, Fiji, Cook, Papua New Guinea, Vanuatu, Tonga, Niue and the American Trust Territory in Micronesia. A few students from outside the Pacific area have attended Blood Bank/ Haematology Courses at the request of the Red Cross Society. These students have come from the Philippines, Nepal, Indonesia and Swaziland. The students are accommodated at Wellington Hospital during their stay in New Zealand. Representatives from the International Health Section of the Department of Health in New Zealand are concerned with student welfare during their stay in New Zealand. The Tutor Co-ordinator of the course plays an extremely important role, not only in teaching the students and co-ordinating the courses, but in providing a reference point for many of the problems which occur while a student is living in a foreign country. Many of the students have attended

NEW ZEALAND INSTITUTE OF

MEDICAL LABORATORY TECHNOLOGY

CERTIFICATE OF QUALIFIED TECHNICAL ASSISTANT

Q.T.A. Regulations
Q.T.A. Examination Application Form
N.Z.I.M.L.T. Membership Application Form

The New Zealand Institute of Medical Laboratory Technology offers to medical laboratory assistants the qualification known as the Certificate of Qualified Technical Assistant (QTA).

The Technical Assistant's Examination Committee is based in Christchurch and all correspondence should be addressed to:—

The Secretary
Technical Assistants Examination Committee
Haematology Department
Christchurch Hospital
Private Bag
CHRISTCHURCH

EXAMINATION SUBJECTS

The examination is offered in the following:—

Clinical Biochemistry
Cytogenetics
General Certificate (see prerequisite 2)
Haematology
Histological Technique
Medical Cytology
Medical Microbiology
Mortuary Hygiene & Technique
Radioisotopes & Radioassay Technique
Immunohaematology
Immunology (Microbiology)

PREREQUISITES

1. Candidates for the examination must be employed as medical laboratory assistants in an approved laboratory and have worked continuously in the subject since 30 June two years previously or accumulated not less than two years practical experience in the examination subject.
2. Small laboratories which require their medical laboratory assistants to work in more than one subject can apply to the Committee for students to train for the General Certificate Examination.
3. A laboratory which requires a medical laboratory assistant to work in a narrow field may apply to the Committee for the student to train for a Special Certificate Examination (Note syllabus requirements).
4. Candidates for the Immunohaematology Examination must have completed not less than 320 hours and candidates for the General Certificate Examination not less than 160 hours in practical cross-matching of blood for clinical use.

SYLLABUS

1. The syllabuses for all subjects (except Special Certificates) are available from the Secretary, Technical Assistants Examination Committee.
2. Medical laboratory assistants intending to train for a Special Certificate Examination must have a detailed syllabus prepared by the charge technologist and forwarded to the Committee for approval at least 6 months before the examination.

EXAMINATIONS

1. The examinations will be held annually during the month of May.
2. Candidates must complete an examination application form and forward this, together with the appropriate examination fee, to the Secretary before the closing date. **(NOTE: LATE APPLICATIONS WILL NOT BE ACCEPTED)**
3. The examination will consist of two written papers, each of two hours duration.
4. The candidate must obtain an overall mark of 50% to pass the examination. Candidates for the General Certificate Examination must obtain a minimum of 40% in each of the four sections and 50% overall to pass the examination.
5. The results of the examinations will be announced by the New Zealand Institute of Medical Laboratory Technology. **Successful candidates who are financial members of the Institute at the time of the examination will be awarded the QTA badge and certificate.**
6. The candidate's script will be returned upon receipt of a written application by the candidate. No copy will be retained and no correspondence relating to the marking of the script will be entered into.

NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY

What is the Institute?

The NZIMLT is an organisation of people who work in medical laboratories and who have united to carry out certain functions for the profession, which cannot be performed by the individual alone.

Included in those eligible for membership are all people who work in this profession — medical laboratory assistants, medical laboratory technologists and science graduates. All have a moral obligation to support the organisation by becoming interested financial members.

What does the NZIMLT do for its Members?

1. It initiates and negotiates changes in education and training. A continuing and involving process.
2. It publishes a scientific journal which is distributed free to all members and operates a free audio-visual training library.
3. It supports the organisation of an annual scientific meeting, workshops and one day seminars (at local branch level) thus providing a unique opportunity for further colleagueship and friendship within the profession.
4. It conducts examinations for Fellowship and the Certificate of Qualified Technical Assistant. Although medical laboratory assistants who are not members of the Institute are eligible to sit the QTA examination, it is **only members who will receive the qualifying badge and certificate.**
5. It provides availability and access to study and travel awards and prizes.
6. It allows members who are employed by Hospital or Area Health Boards or Government departments to have access to the Public Service Investment Society.

ROCHE
Your partner in Science and Health

BIOCHEMISTRY

Certainly, 'user friendliness' is not the only criterion in the selection of a biochemistry analyser. But it is definitely an important consideration. COBAS MIRA (now with ISE[s]) offers the optimal combination of flexibility, reliability and 'user friendliness' available in a TRUE random access analyser. Like most successful concepts, COBAS MIRA is *simply* accurate, *simply* precise, *simply* efficient — and VERY cost effective.

ROCHE

ROCHE PRODUCTS (NEW ZEALAND) LTD

P.O. Box 12-492, Penrose, Auckland, New Zealand. Telephone 640-029.

COBAS MIRA SYSTEM FOR CLINICAL CHEMISTRY

EXPERT ADVICE
is the first of seven
components making up
the BM/Hitachi System

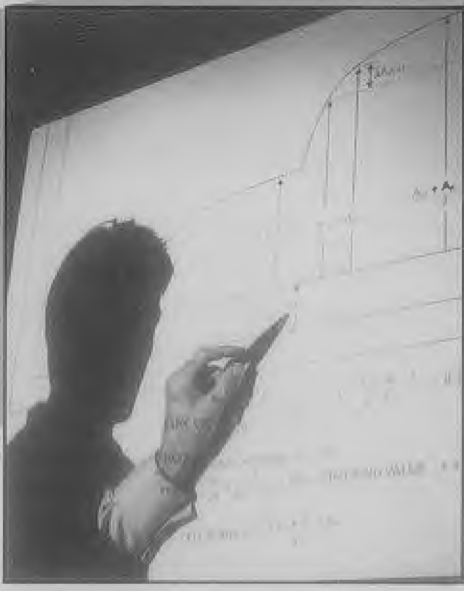
THE PROVEN ANALYSERS
are the second of the
seven components making
up the BM/Hitachi System

RELIABLE CUSTOMER SERVICE
is the sixth of seven
components making up
the BM/Hitachi System

EXTENSIVE CUSTOMER CARE
is the last of the seven
components making up
the BM/Hitachi System

THE HARMONIZED REAGENTS
are the third of the seven
components making up the
BM/Hitachi System

INNOVATIVE METHODOLOGY
is the fourth of the
seven components making
up the BM/Hitachi System



INTENSIVE TRAINING
is the fifth of seven
components making up
the BM/Hitachi System

new zealand

The seven components of the BM/Hitachi System for blood analysis

Copies of articles from this publication are now available from the UMI Article Clearinghouse.

For more information about the Clearinghouse, please fill out and mail back the coupon below.

Yes! I would like to know more about UMI Article Clearinghouse. I am interested in electronic ordering through the following system(s):

- ☐ DIALOG/Dialorder
- ☐ ITT Dialcom
- ☐ OnTyme
- ☐ OCLC ILL Subsystem
- ☐ Other (please specify)________
- ☐ I am interested in sending my order by mail.
- ☐ Please send me your current catalog and user instructions for the system(s) I checked above.

Name________

Title________

Institution/Company________

Department________

Address________

City________ State____ Zip____

Phone ( ) ________

Mail to:

University Microfilms International
300 North Zeeb Road, Box 91
Ann Arbor, MI 48106

NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY

Application to Sit the Examination of Qualified Technical Assistant 9 and 10 May, 1989

SECTION A — TO BE COMPLETED BY THE CANDIDATE

Name: Mr / Mrs / Miss ....

(Surname) (First Names)

Laboratory ....

Lab. Address ....

....

Subject (Haematology, Microbiology, etc.) ....

Are you a member of the NZIMLT YES/NO

Application for membership may be made on the reverse side of this form. If the application for membership accompanies this form then the reduced examination fee applies.

EXAMINATION FEE $110.00 (GST inc.) reducible to $55.00 (GST inc.) if currently a financial member of the N.Z.I.M.L.T.

FEE ENCLOSED $ .... DATE .... SIGNATURE ....

SECTION B — TO BE COMPLETED BY THE PATHOLOGIST OR CHARGE TECHNOLOGIST

Date Candidate commenced work in examination subject ....

"I certify that the above candidate meets the requirements of the Q.T.A. Regulations"

Signed ....

Designation ....

Please state the name and address of the person responsible for receiving the papers and supervising the Examination in your laboratory or centre

Name ....

Address ....

....

....

Office use only

APPLICATIONS CLOSE FRIDAY 24 FEBRUARY, 1989

Please forward application forms accompanied by fees to: Mr B. T. Edwards, Secretary, Technical Assistants Examination Committee, Haematology Department, Christchurch Hospital, Christchurch 1.

LATE APPLICATIONS WILL NOT BE ACCEPTED

THE NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY (INC.)

Application for Membership (For use with Q.T.A. Examinations only).

(Please Print Clearly and Tick Appropriate Box)

I,

SURNAME ______________________________

MR, MRS, MS, MISS ______________________________

INITIAL(S) __________

FIRST NAME(S) ______________________________

MAIDEN NAME ______________________________

OF,

WORK ADDRESS ______________________________

____

____

HOME ADDRESS ______________________________

____

____

PLEASE LEAVE BLANK

L ______
R ______
S ______
E ______
M ______

Received ______
Acknowledged ______
Council ______
Notified ______
Convenor ______

Hereby apply for membership of the New Zealand Institute of Medical Laboratory Technology in the category of:

☐ Member

AND Certify That I Have:

☐ Not Previously Been a Member ☐ Previously Been a Member (State Category:__________)

☐ Resigned (Date:__________) ☐ Did Not Resign

I am employed as: ______________________________

in the Speciality Department of: ______________________________

Highest Professional Qualification: ______________________________ Year Obtained: __________

Nominated by: ______________________________

(Current Financial Member N.Z.I.M.L.T.)

PLEASE TICK METHOD OF PAYMENT YOU WISH

☐ BY INVOICE: DO **NOT** SEND MONEY, WE WILL INVOICE YOU.

☐ BY SALARY DEDUCTION: SIGN THE DEDUCTION FORM BELOW. **WE WILL ADVISE YOUR EMPLOYER.**

AUTHORISATION FOR DEDUCTION FROM SALARY

NAME: ______________________________

EMPLOYER: ______________________________

I authorise the above-named employer to deduct the current subscriptions to the New Zealand Institute of Medical Laboratory Technology (Inc.) from my salary and to pay the amount to that Institute. This authority is to remain in force until cancelled in writing by me.

Signed: ______________________________ Date: ______________________________

N.Z.I.M.L.T. Computer No. ______________________________

more than one course. Some students have had the opportunity to gain work experience in smaller laboratories outside of Wellington. The co-operation of the Technologists in Charge of these smaller centres is very much appreciated by the people involved with the P.P.T.C. and appreciated by the students who feel more at home in a smaller laboratory.

At the completion of each course a graduation ceremony is held where people representing the various organisations that contribute to the work of the P.P.T.C. are present. A representative from either the New Zealand Government or someone prominent in Pacific Island Affairs is invited to speak and present the prizes. The New Zealand Institute of Medical Laboratory Technology presents each student with a badge and with textbooks appropriate for use in Pacific Island laboratories. All Pacific Island laboratories regularly receive copies of the New Zealand Journal of Medical Laboratory Technology.

Student follow up

In 1984 the Tutor, Andrea Hall, visited laboratories in the Pacific region where former students of the P.P.T.C. were working. The P.P.T.C. saw this is an important aspect of the work. In essence the trip confirmed that in general the training offered at the P.P.T.C. was appropriate and pitched at the correct level. The trip was also invaluable in ascertaining the type of laboratory equipment in use in each Island laboratory visited. The tutor was also able to establish which Islands followed American procedures and which were influenced by British/French/New Zealand or Australian methodology. It was obvious from this visit that laboratory medicine had a low priority in many Pacific Island countries where the emphasis was on primary health care. Copies of her report were sent to the Ministry of Foreign Affairs and the Department of Health.

The Tutor Co-ordinator's follow-up visit was complemented in 1984 by a W.H.O. Pacific assignment undertaken by Mr. Michael Lynch of the Wellington Polytechnic who worked as an expert in medical laboratory technology for the Western Pacific region of W.H.O. during the 1983-84 period. Mr. Lynch was subsequently appointed Tutor Co-ordinator in 1985 after the resignation of Mrs. Hall.

Quality Assurance Programme — further follow-up of students.

World Health Organisation was keen to see a programme begin as a means of testing trainees capabilities after their P.P.T.C. attendance. It was felt that the results obtained from the Quality Assurance programme would be a useful means of assessing the value of the P.P.T.C. courses.

The first programme began in microbiology with a combined effort from the National Health Institute in New Zealand and the Pacific Paramedical Training Centre. Difficulties were encountered in the beginning with slow or no return of results from participating laboratories. The problem often lay with laboratory supervisors or administrators who were less enthusiastic and less aware of the importance of the quality assurance programme than trainees who had attended the P.P.T.C. courses.

A haematology quality control programme was trialled in 1986 and the returns from this were quite heartening. The students who had participated were obviously very keen to have communication with the P.P.T.C. and indicated that they would be willing to participate in further trials. The task of organising quality control programmes for a large number of students spread over many islands is a daunting one. In 1987 the Steering Committee of the P.P.T.C. decided to appoint a person on a part time basis to the school to supervise the collection of suitable material and reagents etc., for the quality control programmes. This person is also responsible for the dispersal of the quality control programme to all the participants and provides assistance with the collation of the results. The P.P.T.C. sees this aspect of quality control as an important part of the development of the school and a means of keeping in contact with the students. It will only be successful if it is conducted on a regular basis and if there are occasional follow-up visits by the Tutor Co-ordinator. W.H.O. have indicated in a letter to the P.P.T.C. that if laboratories are not co-operative in participating in the quality control programmes, they should be made aware that they risk losing W.H.O. support.

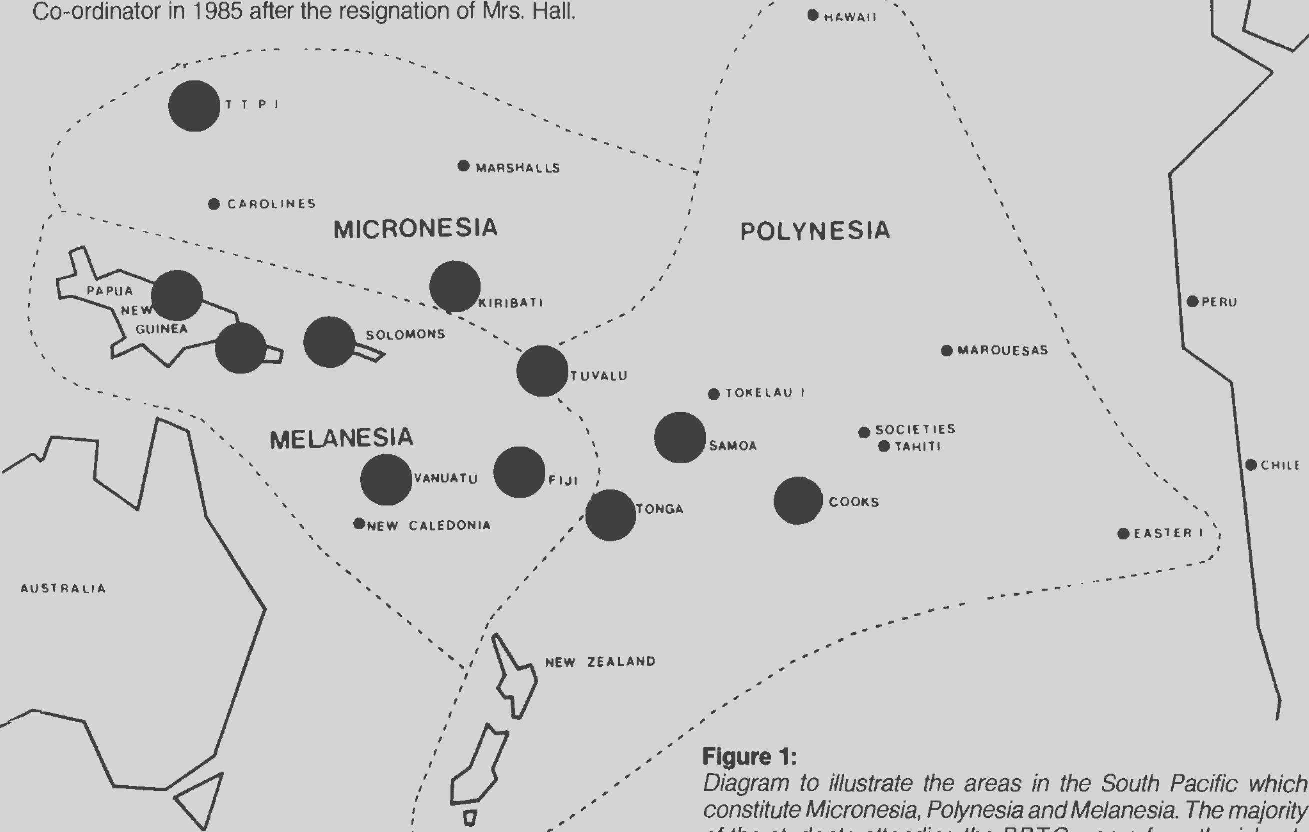


Figure 1:
Diagram to illustrate the areas in the South Pacific which constitute Micronesia, Polynesia and Melanesia. The majority of the students attending the P.P.T.C. come from the islands marked ●

An Outline of the Growth and Development of the Pacific Paramedical Training Centre

Marilyn M. Eales, F.N.Z.I.M.L.T., Haematology Department, Middlemore Hospital.

The Pacific Paramedical Training Centre known in New Zealand as the P.P.T.C. is located at Wellington Hospital, Wellington, New Zealand, and is dedicated to the promotion of appropriate health technology throughout the Pacific region. The land areas of the South Pacific region divide into five distinct groups. These five groups are Polynesia, Melanesia, Micronesia, Australia and Indonesia. The majority of the students come from Polynesia, Melanesia and Micronesia (see Fig. 1).

Appropriate technology is defined as practical teaching to meet the needs of each student in his/her own laboratory. Emphasis is placed on teaching "how to do it" rather than "the give" aspect. It can best be explained by the following illustration.

Give a man a fish and you feed him for a day.

Tomorrow . . . he may be a beggar.

Teach a man to fish and you feed him for life.

Tomorrow . . . if well taught . . . he will be teaching others.

In 1978 the Council of the N.Z.I.M.L.T. had received several reports, both official and unofficial about the training of Pacific Islanders in the New Zealand laboratory scene. The basis of the majority of these reports was that the equipment used and the techniques taught in the New Zealand laboratory were not applicable in Pacific Island laboratories. In other words the training they were receiving was felt by those involved with their training to be inappropriate. Council raised this matter with the Foreign Affairs Department in New Zealand who indicated they would be willing to discuss with the N.Z.I.M.L.T. any submissions about more appropriate training for medical laboratory technologists from the Pacific Islands.

At this point I was co-opted on to the Education Subcommittee to help prepare the ground for these submissions. I presume that the reason for my selection in this matter was because of my own personal concern after several years in Pacific Island laboratories.

Dr. Radjovik was at that time, the WHO Regional Advisor for the Western Pacific based in Manila. In a communication to me in 1976 he wrote, "Although we have in mind establishing a regional training centre for laboratory technicians in the future, at the moment there is no unique training programme for the entire area. The reason for this is that different countries have different problems which are reflected in their respective teaching programmes. Once common problems and interests are crystallised an integrated programme for the area will become feasible".

In 1978 Dr. Radjovik visited New Zealand and had discussions with Dr. Sinclair from the New Zealand Health Department. The Educational Subcommittee of the N.Z.I.M.L.T. sent an enquiry around all New Zealand laboratories seeking information about the training of Pacific Island students. It soon became obvious that there was no co-ordinated organisation either in New Zealand or the Pacific Islands that dealt with the selection and placement of Pacific Islanders who were required to do a course or part of a course in medical laboratory technology in New Zealand. The Education Department who allocated some of the scholarships had no specific instructions. The reply from the Scholarships Officer of the Education Department to my enquiries was as follows, "We have never had any Pacific Island trainees sent here specifically for training as medical laboratory technologists. All for whom this office has been responsible have been selected by their governments for New Zealand Government scholarships and have come here as school pupils. Each of those for whom we have requested training as a medical technologist have stated some interest in science and have opted for this training, for which there is a requirement at home and their governments have agreed. It is on this basis that our requests have been made".

The problems implied in this were enormous.

1. The student did not know his/her own Island laboratory.
2. The student did not know that techniques being taught would be inappropriate for his/her home laboratory.
3. The student had all his/her secondary schooling in New Zealand and after 3-5 years training in a New Zealand laboratory did not want to go back to a country he/she had grown away from.
4. The salary differential was a cause for concern. Students saw themselves doing the same work in the laboratory, aiming for the same examinations and earning several

thousand dollars less than their New Zealand counterparts.

5. He/she may or may not complete the course and was then expected to return to Tonga or Samoa and run the laboratory. After all this training the student found he/she could not do a haemoglobin estimation or a blood sugar in his/her own environment because he/she has not seen or used in New Zealand, a Sahli haemoglobinometer, a Lovibond Comparator or a simple E.E.L. spectrophotometer. He/she could not understand why there was no Coulter counter, no Technicon auto analyser and no "on line" computer to all the aid post stations. Frustrated and disappointed he/she invariably wanted to return to New Zealand.

For many years New Zealand had accepted for training, either through the World Health Organisation or the New Zealand Development assistance programme administered by the New Zealand Ministry of Foreign Affairs, some 5-6 laboratory technologists every year for "on the job" training. These students who had done some training in their own environment prior to being sent to New Zealand or Australia, were slightly better off than the school-leaver scholarship beneficiaries. These students at least knew their own environment but they often did not know what they had been sent away to learn. Overseas grants from whatever source are a "prestige thing" in the Islands, and regrettably some governments award these on the basis of length of service (almost like an award) without specifying a particular project or course. Host laboratories are confused also mainly due to lack of appropriate information. Those of you who have trained such students may well wonder what happens when they return home. I can site a few instances from my own personal experience.

1. The lad who was sent to Melbourne from Fiji to do Haematology. He found he liked Histopathology and the Histopathology Professor, so did a nine month course in Histopathology. All the host laboratory knew was that he would be with them for 9 months. His Histopathology experience was not recognised on his return home.
2. The lad who knew his Island laboratory had no knowledge of coagulation procedures, so while in a Sydney laboratory for six months, made it his business to learn coagulation procedures so he could put his knowledge to good use on his return home. The Health Department unfortunately sent him to an outer island for several years. No one understood or wanted to know what he had tried to do while he was in Sydney. There is still to my knowledge, no basic coagulation protocol in that country.
3. The lad who had all his schooling in New Zealand and then did five years training in a New Zealand laboratory who returned home unqualified. His years from boyhood to manhood had been spent in another environment. He found it difficult to fit in with his former school friends, was scoffed at because he really was not qualified in anything, did not even have a laboratory certificate from his own country. He underwent a mental breakdown. An understandable event under the circumstances.

There was no doubt that:

1. The finance available was being spent inappropriately.
2. That the students who were supposed to be benefitting were not happy with the scheme.
3. That members of the New Zealand Institute of Medical Laboratory Technology were willing to help with the training but wanted to see a more directional approach.

In 1978 there were two established Medical Laboratory training centres in the Western Pacific, based at Suva, Fiji and Port Moresby, Papua New Guinea. Both these schools catered for students from other islands in the Pacific.

The Education Subcommittee considered ways in which the N.Z.I.M.L.T. could profitably direct its efforts to assist in consolidating training programmes for Pacific Island students. These included:

1. Provision of textbooks, training materials and equipment to the Papua New Guinea and Fiji Training Schools when these were requested. (Most moves in this direction in the past had been on an individual and unco-ordinated basis).
2. Seconding New Zealand technologists with tutoring experience for varying periods of time to the training schools in the Pacific with the main emphasis being on setting them up on a sound basis.

I had personal reservations about this as I believe we have no right to interfere with any Island training programme unless invited by Island Governments to do so. The selection of personnel for these tutoring jobs should be very carefully screened. Pacific Islanders are well aware of those Caucasians and others who go to their Islands for a "busman's holiday" only. They find continuous changing of personnel disruptive as medical technologists are individuals and do not all preach the same gospel about the same tests. The variations on the simple cross-match being one example. This is an aspect difficult for them to cope with.

1. Inservice training courses could be arranged in New Zealand so that Pacific Island technologists gained experience in laboratories relevant in terms of size, degree of work and automation, (or lack of it), to their home conditions.
2. Establish a manual training laboratory in New Zealand simulating conditions and equipment in the Pacific Islands. The prime aim of such a laboratory would be to teach appropriate technology.

Wellington Hospital already had plans to set up a manual training laboratory for students who had received a qualification in their own country. Dr. Ron McKenzie and Professor Sandy Ford had been working towards the establishment of such a laboratory. Professor Ford was at that time Senior Lecturer in Chemical Pathology, the Department of Pathology, Wellington Clinical School of Medicine, and Head of the Division of Chemical Pathology, Department of Laboratory Services, Wellington Hospital and Ron McKenzie was the administrative Medical Technologist at the Department of Laboratory Services at Wellington Hospital. He was also a member of the National Executive of the New Zealand Red Cross Society.

In Wellington approval had been secured from the Wellington Hospital Boad, for the use of 1700 square feet of floor space which already included a laboratory area, office, seminar room and storage space. This space was made available for an initial period of three years at a generous rental. The New Zealand Red Cross Society had been equally generous in agreeing to meet this rental cost which includes utilities, repairs etc. In view of the findings of the enquiry conducted by the N.Z.I.M.L.T. and the facilities available at Wellington Hospital, the N.Z.I.M.L.T. decided to support the establishment of a Pacific Paramedical Training Centre at Wellington Hospital. The New Zealand Health Department, International Health Section was very supportive of the P.P.T.C. initiative, in spite of the fact that it ran contrary to the policy of training within the region and not within a developed country. The reasons for their support were:

1. There was an excellent facility available at no cost to the New Zealand Government.
2. The proposed group training was immeasurably superior to the attachment of an individual to a busy service department.
3. The availability of a high volume of relevant clinical material at a hospital such as Wellington, would provide trainees with a maximum of experience in a very short time compared with the likely exposure in their own countries.

Minutes of the Special General Meeting of the New Zealand Institute of Medical Laboratory Technology held in Rotorua on the 31 August 1988 commencing at 5.15 pm.

Chairman
Mr W Wilson.

Minutes
It was resolved that the Minutes of the Special General Meeting held on the 20 August 1987 be taken as read and approved.

D Pees/A D Nixon

Business Arising
R Austin asked why Council had not advised the Medical Laboratory Technologists' Board of decisions passed at the meeting relating to the future of the Specialist Certificate Examination. The Meeting was advised that Council accepted fault in not advising the Board and that the matter would be discussed further under General Business.

Remits
It was moved D Dixon-McIver, seconded D Pees "that all examinations run under the auspices of the NZIMLT be for Institute members only".

Speakers on the motion included D Dorman, C Cameron, B Edwards, P McLeod and J Parker.

After discussion it was moved D Dixon-McIver, seconded P McLeod "that the motion be amended by preceding the motion with the words 'that Council investigate' ".

After discussion the amendment was put to the Meeting and carried with one vote against.

The amended motion was then put to the Meeting and carried with one vote against.

It was resolved that Policy Decision no. 6 be reaffirmed.

D Pees/C Campbell

Policy Decision no. 6 (1979): That the council must be informed in advance of national workshops, seminars or similar gatherings which are being conducted under the aegis of NZIMLT branch organisations.

General Business
It was moved A Johns seconded E Johnston "that if the Medical Laboratory Technologists' Board ceases to offer the Specialist Certificate Examination, the NZIMLT offer, as an interim replacement, a syllabus based theory examination equivalent to the current Specialist Certificate Examination and that the present status of the Fellowship remain unchanged".

After discussion it was moved B Edwards seconded K McLoughlin that the motion be amended by inserting the words 'in haematology, immunohaematology, microbiology and clinical biochemistry' after the words 'theory examination'.

After discussion the amendment was put to the Meeting and declared lost on a show of hands.

The original motion was then put to the Meeting and declared carried on a show of hands.

It was moved D Dixon-McIver seconded J Le Grice that this meeting instruct Council to state publicly that the NZIMLT disagrees with the 'Band Aid' approach to the lack of properly trained cytology screeners being adopted by the government and that the money would be better spent in training medical laboratory technologists to the approved standard. This statement to be sent to the Press, Television New Zealand and radio stations as well as the Minister of Health and Under Secretary of Health".

After discussion the motion was put to the meeting and carried on a show of hands.

The meeting was adjourned at 6.05pm and reconvened at 6.25pm at an alternative venue.

It was moved S Khull seconded I Lee "that all technologists intending to sit a specialist level examination notify the NZIMLT in writing of their intention by 31 January of the year in which they intend to sit and that such examinations only be held by the Institute in a particular subject if there are at least two candidates for that year".

After discussion it was moved D Dixon-McIver seconded D Dorman that the motion be divided into two clauses and this proposal was put to meeting and declared carried on a show of hands.

It was moved S Khull seconded I Lee "that all technologists intending to sit a specialist level examination notify the NZIMLT in writing of their intention by 31 January of the year they intend to sit".

After discussion the motion was put to the meeting and declared carried on a show of hands.

It was moved S Khull seconded I Lee "that such examinations only be held by the Institute in a particular subject if there are at least two candidates for that year".

After discussion the motion was put to the meeting and declared lost on a show of hands.

It was moved J Parker seconded T Rollinson "that if the Board does not have a decision on the Specialist Examination by the November meeting they be asked by the Institute to have the decision deferred one year".

After discussion the motion was put to the meeting and declared carried on a show of hands.

It was moved R Nicholas seconded D Dorman "that Council write to the Minister of Health strongly advocating that in view of the delay in getting regulations reducing the period of training to four years such regulations take effect from 1990".

After discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved A Buchanan seconded A Watson "that papers on issues to be discussed are circulated, where possible, three months prior to the date of action and that submissions are widely called for and made available for inspection by members of the NZIMLT".

After discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved D Pees seconded C S Shepherd "that the NZIMLT use the provisions of the Labour Relations Act to establish awards for medical laboratory workers in private medical laboratories but excluding laboratory assistants employed in private medical laboratories in the Northern Industrial District".

After discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved P McLeod seconded D Dixon-McIver "that the Council of the Institute establish a separate union to undertake negotiations on behalf of and have the rights of representation for medical laboratory workers in accordance with aims, objects and structure as circulated in the discussion paper".

After brief discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved P McLeod seconded D Dixon-McIver "that the union to be established be known as the New Zealand Medical Laboratory Workers Union".

After discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved P McLeod seconded D Dixon-McIver "that the Council draw up and submit appropriate rules for the union to the Registrar of Unions for registration".

After brief discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved P McLeod seconded D Dixon-McIver "that the Negotiations Committee be the interim executive of the

union, until the union officers are elected in accordance with the rules. The election for union officers must be held within six months of registration of the union".

After brief discussion the motion was put to the meeting and carried unanimously on a show of hands.

It was moved P McLeod seconded D Dixon-McIver "that once the union is established and the office bearers elected, the Council is to formally pass to the union representational rights and notify the Registrar of Unions accordingly."

After brief discussion the motion was put to the meeting and carried unanimously on a show of hands.

M Silverstone asked about compulsory membership of the new union. Mr R Perkins advised that the members of the new union would make this decision.

It was moved R Austin seconded G Bennett "that the Institute write to the Medical Laboratory Technologists' Board advising what decisions were made at the 1987 Special General Meeting and also the decisions taken at the 1988 Special General Meeting relating to the Specialists Certificate Examinations."

After discussion the motion was put to the meeting and carried on a show of hands.

Mr C Campbell then proposed a vote of thanks to be recorded for the work done by the Chairman in conducting the meeting.

The motion was greeted with acclamation.

There being no further business the meeting closed at 7.12pm.

A Seminar in Coagulation and Platelet Disorders

This two day seminar will cover the following topics.

COAGULATION: Thursday June 15th 1989.

Sessions to include:

1. Bleeding Disorders
   — Current trends in Haemophilia Management.
   — Diagnosis and treatment of von Willesbrands disease and Minimal bleeding disorders.
2. Thrombotic Disorders
   — Diagnosis of thrombosis.
   — Laboratory evaluation of patients with thrombosis.
   — Treatment of thrombotic disorders.
3. Case Histories, Problem solving.
   — Material to be circulated to participants prior to Seminar.

PLATELET DISORDERS: Friday June 16th 1989

Sessions to include:

1. Qualitative Platelet Disorders.
   — Diagnosis and treatment.
   — Electronmicroscopy and Platelet markers.
2. Quantitative Platelet Disorders.
   — I.T.P.
   — Myeloproliferative and Myelodysplastic disorders.
3. Case Histories and Blood Film interpretation.
   — Material to be circulated to participants prior to Seminar.

This is intended to be a highly interactive programme with an emphasis on problem solving that should be of interest to all Technologists working in Haematology, particularly those from smaller laboratories.

DATES **Thursday 15th and Friday 16th June 1989.**

VENUE **Ernest and Marion Davis Post Graduate Medical Centre Auckland Hospital, Auckland.**

ORGANISED BY **Auckland Haematology Charge Technologists Group on behalf of the N.Z.I.M.L.T.**

Further details will be made available to Laboratories early in 1989.

- Affordable
- Technically advanced
- Operationally economic
- User-friendly

The new AVL 995 fully automated blood gas analyser

Designed to meet the most demanding needs:

- Sturdy yet sensitive electrodes
- Built-in thermo-printer provides printouts of pH, PCO_2, PO_2 plus nine calculated values
- For electrolytes, connect to any AVL analyser (Na^+, K^+, Cl^-, Li^+, TCO_2)
- Automatic cleaning cycle for maximum safety
- Built-in gas mixing eliminates costly calibration
- Standard AVL Data-Link management interfaces with any PC, oximeter or ticket printer

Leader in Clinical Microanalysis

Marketed by

Salmond Smith Biolab Ltd

Wilton Instruments Division

AUCKLAND	WELLINGTON	CHRISTCHURCH
Private Bag Northcote 9	P.O. Box 31-044	P.O. Box 1813
Phone 418-3039	Phone 697-099	Phone 663-663

WILTONS

WNT 150

The most reliable osmometer in the world . . .

. . . 3MO from Advanced Instruments

So automatic it leaves nothing to chance:

- Automatic calibration
- One-step sample handling
- 20 microlitre sample size
- One minute test time
- Uses proven freezing point method
- No bath liquid
- Totally redesigned electronics.

More reasons why Advanced Instruments remains the most respected name in osmometry.

ADVANCED INSTRUMENTS, INC.

Marketed by

Salmond Smith Biolab Ltd

Wilton Instruments Division

AUCKLAND	WELLINGTON	CHRISTCHURCH
Private Bag Northcote 9	P.O. Box 31-044	P.O. Box 1813
Phone 418-3039	Phone 697-099	Phone 663-663

WILTONS

WNT 140

Wellington Branch: NZIMLT Seminar

A one-day medical laboratory technology seminar was held on 18 June 1988 at the Wellington School of Medicine. Approximately 100 delegates from the Taranaki, Wairarapa, Manawatu, Hawkes Bay, Nelson and Wellington regions attended. The morning session was devoted to the subject of hepatitis, which was started by the Guest Speaker, Professor E W Pomare, Head of the Department of Medicine at the Wellington School of Medicine. This was followed by three other papers on hepatitis.

After an excellent lunch, a variety of haematology, microbiology and biochemistry papers were presented. This was followed by a social hour kindly sponsored by Boehringer Mannheim NZ Ltd. During the social hour, a presentation was made by Watson Victor Ltd for the best paper presentation during the day. This was won by Mrs Yvonne Bird of the Biochemistry Department, Wellington Hospital.

The papers presented at this seminar are abstracted below.

Hepatitis and the Laboratory

E W Pomare, Department of Medicine, Wellington School of Medicine

The importance of hepatitis B lies in its being amongst the most common of the viruses causing hepatitis and its association with more severe and chronic forms of the disease. Hepatitis B prevalence rates in New Zealand are considerably higher in Maori than in non-Maori such that high risk areas have been identified in the northern and eastern parts of the North Island. It is estimated that there are likely to 5,000 to 10,000 new cases of hepatitis B per year in New Zealand, 60,000 to 90,000 hepatitis B carriers in the community of whom 12,000 to 18,000 may be HBeAg positive and therefore highly infectious. Studies have been carried out in New Zealand in laboratory staff and have shown that over 20% of technical staff have markers for hepatitis B, this proportion being significantly higher than that found in new blood donors or in laboratory staff not handling blood samples. Sub-clinical hepatitis B infections are therefore occuring in laboratory staff and protection by vaccination of such staff is recommended along with procedures in the proper care and handling of blood and other biological specimens.

Hepatitis Markers

Patricia Maddocks, Department of Laboratory Services, Microbiology Division, Wellington Hospital, Wellington

The first Hepatitis marker, Australia Antigen (AuAg) was discovered in the serum of an Australian Aborigine over 20 years ago. This marker is now known as Hepatitis B surface Antigen (HBsAg). The causes of Primary Viral Hepatitis are:

Hepatitis A virus (HAV)
Hepatitis B virus (HBV)
Hepatitis Non-A, Non-B (NANB)

Several hepatitis B markers are now used in this Diagnostic Laboratory to assist the Physician with diagnosis of the Hepatitis type. The order of appearance of these markers in serum will be described and their use in diagnosis and monitoring of Hepatitis discussed.

Several test profiles will be presented to show the use of these markers in the disease diagnosis and monitoring.

The Frequency of Hepatitis B Serological Markers in the South Pacific

Michael Lynch, Pacific Paramedical Training Centre

The frequency of positive results for serological markers of hepatitis B virus infection is reviewed in two South Pacific populations. The evidence of current or previous infection in a six hundred and two sample of the population in the Republic of Kiribati is reported to be 98%. Similar investigations in the polynesian island of Niue revealed an infection rate of 95%. The implications of these infection rates on the future prevalence of chronic hepatitis B, hepatocellular carcinoma and other liver disease is discussed. The difficulties associated with the provision of a safe blood transfusion service is highlighted and a suggestion is made that perhaps the patient rather than the donor should be tested for evidence of infection before transfusion.

It is suggested that the long term control of hepatitis B in the Pacific Islands rests with the vaccination of all children at birth or soon after.

"HBsAg screening of donors — technical problems during change of test methods"

J Meredith and J Freemantle, Immunohaematology Department, Wellington Hospital

Approximately two years ago we examined a then new type of kit for the determination of Hepatitis B surface Antigen by an enhanced E.L.I.S.A. technique. For various reasons at that time, including financial, it was decided not to change to this method.

Some twelve months later as a result of examining recent Hepatitis Antigen Proficency Surveys it was decided to change to the enhanced E.L.I.S.A. system as it was more sensitive than our current method, and was compatable with existing automated instruments.

Unfortunately when in routine use we found an unacceptably high number of positives that were repeatable by our method; but could not be confirmed by another laboratory using a different ELISA system.

There was nothing wrong with the enhanced ELISA Kit in question, but there was with our technique in regard to incubation temperature and type of sample.

Intra-Individual Variability of Platelet Parameters over time in the normal individual

John M Carter[1,2] Philip J Wakem[1] and Robert W L Siebers[3], Department of Haematology[1], Departments of Medicine[3] and Pathology[2], Wellington Hospital and Wellington School of Medicine

Modern haematology analysers are able to routinely measure various platelet parameters such as mean platelet volume (MPV) and platelet distribution width (PDW). Increased MPV values have been demonstrated in pregnancy-inducated hypertension and in patients with thrombocytopenia or thrombocytosis; while adrenaline infusion causes an increase in platelet numbers, volume and release action. Blood collected in EDTA shows an increase in MPV over time when measured by aperture impedance techniques. Thus various technical factors affect MPV measurement and values obtained in pathological states are meaningless unless these factors are taken into consideration. To our knowledge no long-term study of platelet parameters variability has been done. This is imperative if one wishes to study platelet parameters over prolonged periods in disease states.

Eight normal male subjects had blood taken at regular consecutive monthly intervals. Four subjects were followed for six months, one for five months, and three for four months. EDTA blood samples were analysed on a Coulter S Plus V at exactly 15 min and 2 hours respectively after venepuncture. Between-batch coefficient of variation (CV) was 2.0% for platelet count, 1.4% for MPV and 0.5% for PDW (Coulter 4C normal cell control, n=8).

Intra-individual-variability for MPV showed a mean CV of 2.6% at 15 min and 2.0% at 2 hr after venepuncture; for

platelet count a mean CV of 3.2% at 15 min and 2.4% at 2 hr; and for PDW a mean CV of 7.3% at 15 min and 6.5% at 2 hr.

In conclusion, platelet parameters are stable over a prolonged time period in the normal male individual and thus any significant changes in these parameters due to disease states or action of drugs would be real and not due to biological variation.

Urine Protein in Diabetes — the Wellington Experience, 1985-1988

Chew L Lim, Div. of Chemical Pathology, Dept of Laboratory Services, Wellington Hospital

The appearance of albustix positive proteinuria in insulin dependent diabetes often signals the onset of clinical diabetic nephropathy and a progressive decline of glomerular function to end stage renal failure. The important phase of incipient diabetic nephropathy, before dipstix testing become positive, is evidenced by a small increase in urinary albumin excretion. Since only 35% of insulin dependent diabetic patients develop glomerular nephropathy the clinical usefulness of measuring urinary albumin to identify those at risk is obvious. However, because of the large number of tests required, it appears reasonable to use the simpler measurement of urinary total protein as a screening test.

We measured urine protein and albumin concentration in 661 randomly collected urines and found good correlation between urine protein and albumin, especially at elevated levels of protein concentrations. All urines with greater than 200 mg/L of protein also had elevated albumin concentration making the measurement of albumin in these urines unnecessary. However some urines (11.4%) had microalbuminuria even when total protein concentrations were less than 50 mg/L (reference range: 6-148 mg/L). There is therefore no lower limit which safely defines urines not requiring albumin measurements.

A review of 47 sets of longitudinal urine protein and albumin results collected over 4 years (1985-1988) suggests that both protein and albumin excretion rates may be characteristic of each patient. The ratios of these measurements may therefore be meaningful: whether they represent different stages or clinical subsets of evolving diabetic nephropathy is not clear.

Infections in Wellington Hospital AIDS Patients

Patricia Jenkins, Microbiology Division, Department of Laboratory Services, Wellington Hospital, Wellington

Acquired Immunodeficiency Syndrome (AIDS) is characterised by an acquired irreversible profound immunosuppression that predisposes the patient to multiple opportunistic infections and malignancies. The patients with AIDS are particularly susceptible to a variety of protozoal, fungal, viral and bacterial infections.

Since January 1987 15 patients with AIDS have been admitted to Wellington Hospital. From these patients we have isolated numerous pathogens they include *Pneumocystis carnii, Cryptococcus neoformans, Herpes simplex, Cytomegalovirus, Mycobacterium tuberculosis, Staphylococcus aureus, Clostridium difficile* and many intestinal parasites.

A Case Study of Cystic Fibrosis

Tina Hermans, Biochemistry Department, Hutt Hospital

This case presentation is a 3½ year old cute blonde female, born in Denmark. She was the product of a normal pregnancy and weighed 3.5kg at birth, with no neonatal problems.

She was first seen in the Casualty Department in November 1987 with a rectal prolapse. Following injections of Sclerosant in November and also in January 1988, she continued to have regular prolapse problems. She was seen by the Paediatric Department in April 1988. A battery of tests was arranged. The tests and results are as follows: 19.4.88.

XRay: No significant cardiac or pulmonary abnormalities. Abdomen: There is a large volume of faeces in the colon and rectum.

Sweat Test:	1st collectn.	2nd collectn.
Total weight of sweat	0.346g	0.283g
Sweat sodium	85mmol/L	85mmol/L

(Sweat sodim > 50mmol/L is usually diagnostic for cystic fibrosis)

Faecal Fat: 3 day collection —

Weight of specimen	896.9g (3 day total)
Faecal fat	36.2g/day

(Normal faecal fat < 6g/day)

A repeat sweat test confirmed the diagnosis of cystic fibrosis. She has subsequently been started on Pancrease at a fairly modest dose.

Flame Photometry Method for RBC Na^+ and K^+. Methodological considerations and comparison with AAS.

Robert W L Siebers and Timothy J B Maling, Department of Medicine, Wellington School of Medicine, Wellington Hospital

Abnormal red blood cell (RBC) Na^+ and K^+ concentrations and their various transport mechanisms have been demonstrated in human essential hypertension, in patients on digoxin therapy and in chronic renal failure. RBC Na^+ and K^+ concentrations are increasingly being measured in research and general laboratories by both flame photometry and atomic absorption spectrophotometry (AAS). We have compared flame photometry and AAS methods for RBC Na^+ and K^+ measurements with special consideration of the method of sampling viscous packed RBC.

RBC were washed with isosmolar $MgCl_2$ and pipetted with a positive displacement pipette into a LiCl solution as internal standard for Na^+ and K^+ measurement by flame photometry. For AAS the RBC were diluted with distilled water. Pipetting of packed RBC utilising the SMI Digitron positive displacement pipette was precise (CV:0.92%) but a 50 ȣ L setting delivered on average 47.5 ȣ L of packed RBC due to viscosity of the sample. Correlations between flame photometry and AAS were 0.99 for RBC Na^+ and 0.98 for RBC K^+. The reference range for RBC Na^+ and K^+ for females was 5.0-7.6mmol/L and 96-107mmol/L respectively; and for males 5.6-10.3mmol/L and 89-103mmol/L. Results in 12 females taking oral contraceptives were similar to 21 females not on oral contraceptives.

In conclusion, RBC Na^+ and K^+ concentrations can be precisely measured by a simple flame photometer method. Packed RBC can be pipetted precisely utilising a positive displacement pipette. A comparison with AAS and a reference range has been defined based on these methodological considerations.

Turbidimetric Chemistry of Immunoproteins on the Hitachi 704

Paul Tustin, Immunology Laboratory, Wellington Hospital, Wellington

The availability of the Hitachi 704 Random Access analyser with its sensitive and precise photometric capabilities has enabled many traditional Single Radial Immuno Diffusion (SRID) assays to be changed to turbidimetric assays.

Analysis of the acute phase proteins IgG, IgA, IgM and complement C3c, C4 have so far been adapted to

turbidimetric methodologies, with the potential to adapt more low level protein assays in the future.

Advantages of turbidimetric analysis on the Hitachi 704 compared to SRID include: cost effectiveness, increased accuracy and precision, technical simplicity, increased throughput, and the capability to offer results on a stat basis.

The Lupus Anticoagulant-Diagnosis problems and three case histories

G Milicich and P McSweeney, Department of Haematology, Laboratory Services, Wellington Hospital

The Lupus Anticoagulant (LA) is an IgG and/or IgM antibody with activities against phospholipids. It is frequently associated with venous and arterial thrombosis and with recurrent spontaneous abortions and foetal growth retardation. Women with a history of thrombosis or unexplained intrauterine deaths should be screened for the presence of LA[1].

A variety of tests was introduced to detect LA but its presence is most commonly suggested by an unexplained prolonged activated partial thromboplastin time (APTT). Recent studies have concluded that some APTT reagents are more sensitive to LA than others [2]. The evaluation of mildly elevated APTT can be quite perplexing, and it is often difficult to interpret mixing studies in these cases. Other tests thought to be specific for the LA have been found not to be, eg. tissue thromboplastin inhibitor test. New techniques such as platelet neutralisation test, Kaolin clotting time with rabbit brain phospholipid in standard and high concentrations, and the detection of anticardiolipin antibodies appear to be more specific. Multiple tests are often needed to identify the presence of LA. As yet there is no one specific test for LA.

Three case histories will be presented.

1. 42 year old female with ischaemic heart disease. LA detected prior to cardiac surgery. Surgery performed with no bleeding problems.
2. 37 year old female with extensive deep vein thrombosis. History of recurrent abortions, prolonged APTT, cardiolipin antibodies +ve, ANA +ve.
3. 24 year old female with extensive deep vein thrombosis following long car ride. Prolonged APTT. Cardiolipin antibodies +ve.

[1] Lancet 1983; 1: 1361-3.
[2] Arch Pathol Lab Med 1987; 111: 120-4.

Hitachi 717: Assessment, installation and preliminary operation

Y Bird, A Mayhook and J Newton, Biochemistry Dept., Wellington Hospital

The Hitachi 717 is a fully automated random access general biochemistry analyser. It has the capacity to do 600 chemical tests per hour and when equipped with ion-selective electrodes is capable of providing a maximum of 750 test numbers per hour. Its capacity is therefore intermediate between that of the larger 737 and the 704.

We discuss here the assessment of the Hitachi 717 and our reasons for purchasing this analyser. Amongst others, the main reasons for our choice were the on-board cuvette laundering system (not then available in most other discrete random access analysers) and our experience with the Hitachi 704. The capacity required restricted the choice of analysers to the Hitachi 717, Abbott-spectrum and the Technicon CHEM 1. The new analyser will replace 3 other instruments.

Within-batch precision of 18 routinely measured analytes indicate good precision which were mainly less than 2% CV. Preliminary results of inter-batch precision, linearity and patient comparisons are also presented. Some evaluation of alternative chemistries was also carried out. Problem analytes were creatinine, chlorides, and TCO_2. Each problem is unique and required a different solution.

A bar code labelling system is now being developed and full implementation depends on interfacing the analyser with the main laboratory computer.

Hitachi 704: One year down the track — operating and chemical experiences

A Mayhook, Y Bird, J Newton, Biochemistry Dept., Wellington Hospital

The Hitachi 704 is a fully automated random access general biochemistry analyser. It has the capacity to do 180 chemical tests per hour and when equipped with ion-selective electrodes is capable of providing a maximum of 375 test numbers per hour.

The H704 analyser was purchased with funds provided to replace one Abbott VP analyser. The choice was made largely on the basis of its demonstrated excellent precision during initial assessment, and the ease with which good precision can be maintained with minimal effort. Since the H704 was put into routine use in October 1986 it has, in fact, picked up the work load of two Abbott VP's, most of a Centrifichem 400, all of the RID Immunoglobulins, and manual Ammonias.

This laboratory has been consistently in the top 10% of NZ laboratories participating in the Wellcome Survey, and in the top 25% in the world in the past 3-4 years. These rankings have settled nearer the top 5% in NZ and top 5% in the world since the introduction of the H704. These positions are now achievable with considerably less effort and time than previously.

We discuss here the effects of the introduction and use after almost 18 months of the H704, and mention some of the specific problems we have found in its use.

Errata

Sodium and Potassium transport across the Erythrocyte Membrane

One line of the manuscript was inadvertently omitted from a paragraph starting at line five on page 6q (vol 42; August 1988). Here below is the paragraph in full with the missing line underline:

"We have described a buffered and heparinised $MgCl_2$ solution in which whole blood may be stored for five days without loss of Na^+- Li^+CT and for 24 hours without a decline in erythrocyte Na^+ and K^+ concentrations (44). No centrifugation or erythrocyte washing procedures are required prior to laboratory analysis and thus large scale epidemiological studies are practical."

Furthermore on page 6q under the heading Na^+-Li^+ countertransport, the term in vitro was inserted instead of in-vivo. The sentence (with the correction underlined) should read:

"Although Li^+ is not normally present in vivo, Li^+ behaves similarly to Na^+ in studies of this exchange mechanism".

LETTERS TO THE EDITOR

Dear Sir

The Organising Committee of the NZIMLT Conference, Rotorua, wishes to correct an error which we made in the NZIMLT Journal advertisement for Conference.

The Company referred to as Ebos should have read Miles Australia Pty Ltd.

We regret the error and acknowledge Miles Australia Pty Ltd's support for the NZIMLT Conference, Rotorua.

Yours sincerely,
Malcolm Rees
(1988 Conference Secretary)

Dear Sir,

RE: The inexpensive enzyme linked immunosorbent assay for the detection of Hepatitis B surface antigen (HBsAg).

An earlier volume of the NZJ Med Lab Technol detailed the use of a micro-modified commercial method for detection of HBsAg using short (1h/45°C) and long (overnight/room temperature) serum incubation protocols[1].

Investigations were recently conducted to determine if the replacement of the polyclonal conjugate with a monoclonal (Auszyme monoclonal: Abbott Laboratories, North Chicago, IL, USA) conjugate would enahce the sensitivity of the rapid technique without imparing specificity. Conjugate incubation remained constant at 1h/37°C, while serum incubations were subjected to the following regimes:-

(a) 1h/45°C
(b) 2h/45°C
(c) 2.5h/45°C
(d) overnight/45°C
(e) overnight/room temperature

After completion of the experimental manipulations, we concluded that the major factor in determining the sensitivity of the method (where "fresh" conjugate was used) was the duration of the serum incubation phase. The constraint of a maximum 2.5h serum incubation limited detection of HBsAg to the order of 1.0 ngmL^{-1} irrespective of the type of conjugate employed. An extension of the serum incubation to overnight increased the order or detection five fold. Specificity was found not to be impaired by use of the monoclonal conjugate.

We therefore recommend that if work can be processed using an overnight serum incubation protocol, the established method(1) could be utilized providing the monoclonal conjugate is substituted for the polyclonal reagent. However, if a proportion of the workload is to be processed rapidly the best possible HBsAg detection level of 1.0ngmL^{-1} is no longer acceptable and, an alternative rapid detection method (that will give the operator a similar sensitivity to that when overnight serum incubations are used) will have to be employed.

Yours sincerely,

Paul M. Austin, M.Sc(Hons), *Research Officer;* Ian W, Steed ANZIMLT, *Charge Technologist;* Heather L. Richards ANZIMLT, *Quality Assurance Officer, Auckland Regional Blood Centre.*

Reference

1. Steed IW, Anderson RAM, Austin PM. An inexpensive enzyme linked immunosorbent assay for the detection of Hepatitis B surface antigen. *NZJ Med Lab Technol* 1987; **41**(1):8-9.

TECHNICON'S H1 MAKES

The Technicon H1 System is the most advanced automated haematology analyser system in the world because of its unique ability to perform the 'full five part cytochemical differential'.

Button touching simplicity offers RBC Morphology flagging, full WBC differential, unmatched performance, flexibility, quality control and economy – all linked to the most comprehensive report available.

TECHNICON HAEMATOLOGY SYSTEM

RBC
PEROX
RBC VOLUME (0-200 fl)
HGB CONC (0-50 g/dl)
PLT VOLUME (0-20 fl)
BASO

After a relatively short time, Technicon is enjoying tremendous success with the H1 system as Haematologists, Laboratory Managers, Scientific and Technical Officers discover its superior performance and the easy way it completes true

Dear Sir

I am presently looking for employment in New Zealand as a Technologist. I am a 27 year old M.L.S.O. currently working in routine Haematology/Blood transfusion departments on the Isle of Wight. I have nine years working experience in the above departments, working in:-

St Mary's Hospital, Milton, Portsmouth. Nov '79
Queen Alexandra Hospital, Cosham, Portsmouth Nov '86
(Two large district general hospitals with two specialist units — renal dialysis and transplantation Oncology)

References:
Dr. P.J. Green, Consultant Haematologist
St Mary's Hospital, Milton, Portsmouth.

Miss G. Levick S.C.M.L.S.O., Haematology Department
Queen Alexandra Hospital, Cosham, Portsmouth.

St Mary's Hospital, Newport, Isle of Wight Nov '86—

References:
Dr R. Joshi, Consultant Haematologist
St Mary's Hospital, Newport, Isle of Wight

Mr D. Hambry C.M.L.S.O., Haematology Department
St Mary's Hospital, Newport, Isle of Wight.

I have a broad base in both Haematological and Transfusion techniques, including:

Routine Haematology (using Coulter equipment), Cytochemisry, Cell market techniques (using I.F. and APPAP — FIMLS project on development of the latter), Auto-antibody screening, Investigation of Haemoglobinopathies (Screening level), Routine coagulation screening (including 1 and 2 stage factor assays and platelet aggregation), Ante-natal screening, Compatibility testing for transfusion, Microplate blood grouping (— including the development of an enzyme microplate technique).

My wife and I have visited New Zealand, in September 1985 for six weeks touring both the North and South Islands. During my visit to New Zealand I visited a few laboratories both in the public and private sectors, however at that time I was not eligible for employment, as I was not a fellow of the Institute of Medical Laboratory Sciences. Since this time I have retaken the Examination and am now F.I.M.L.S. (hence meeting the condition of the Professional body in New Zealand).

My wife has relations in the South Island, in Canterbury and Oxford, also I have a relation in the North Island who could also act as a sponsor — if required. We both believe that New Zealand will offer better prospects for our further and that of our family.

Yours faithfully
Mr A.H. Neal, F.I.M.L.S.,
17 Longmead Road, Ryde, Isle of Wight, England PO332TN.

Dear Sir,

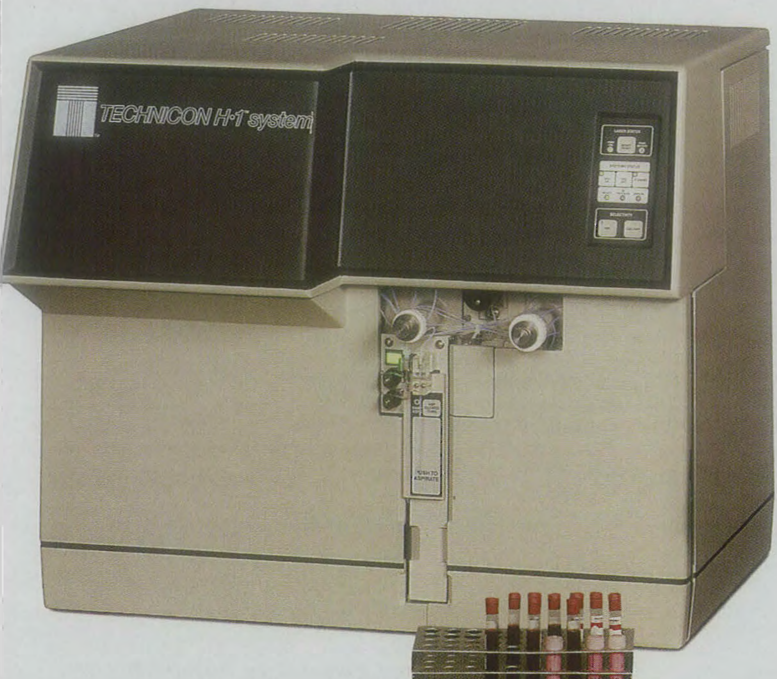
At a recent meeting of the Auckland Haematology Charge Technologists Group, discussion took place on the reticulocyte count, its methodology, system of enumeration, reagents used and reporting of results. It was a matter of concern that many anomalies were manifest.

In February, 1988, an Auckland Regional Haematology Survey was conducted which included reticulocyte counts. There were 9 participating laboratories. For the 3 counts the standard deviations were (1) 23.5; (2) 31.6 and (3) 19.0, and,

ALL THE DIFF!

'Full Differential' reports including Basophils and Eosinophils and flags for blasts and atypical lymphocytes.

The success of the Technicon H1 system is clearly definable in two areas. Firstly, it is successful because of its technical and diagnostic abilities. Secondly, it is successful in the commercial sense because, during the past year, H1 has captured a major part of the market from competition who still insist on offering the old 'three fifths of a diff' technology.



Technicon H1 – five good reasons why you've no excuse even considering another system because a fully automated, five part diff makes all the difference to your laboratory's efficiency and all the difference in the world to your patients.

HAYWARD TC204

the Coefficient of Variation 41%, 74% and 50% respectively.

Those of us who have acted as examiners over the years and who have included reticulocyte counts in the practical examination have been appalled at the wide range of results submitted by candidates — from normal to markedly increased levels on the same count!

The questions to be addressed are:

1. The utility of the reticulocyte count as a contributory diagnostic test in the Haematology laboratory.
2. How it is used in the clinical environment.
3. What level of significance or importance does the Clinician ascribe it.
4. Does the Clinician merely want to know if reticulocytes are increased without requiring an actual count.

Given the poor standard of reticulocyte counting, and, the unlikelihood of automated methodology in the foreseeable future (it is to be hoped that Technicon succeed with their efforts to incorporate a reticulocyte count within the T&B lymphocyte module) should consideration be given to abandoning the reticulocyte count and relying only upon the degree of polychromasia in the stained blood film? Experienced microscopists can estimate the reticulocyte count with remarkable accuracy!

We would welcome comments on this, perhaps controversial subject, from both Technical and Clinical Haematologists and indeed from other interested Clinicians.

On behalf of the Auckland Haemmatology Charge Technologists.

Kathryn M. Schollum,
Charge Technologist, Department of Haematology, Green Lane Hospital.

Surplus Equipment

If any members know of any of the equipment below being surplus to needs and in servicable condition would they please contact the Editor.

Equipment Needed

Anaerobic Jar — BBL Gaspak Anaerobic System 100TM — 60636
Balance, Analytical — Sartorius Model 2842
Centrifuge Coombs — Clements 91241
Microfuge — Beckman Microfuge B
Centrifuge, General Purpose, Bench — Clements 92010
Colorimeter, without Flo'Thru Cell — Corning 252
Colorimeter, with Flo'Thru Cell — Corning 252
Dessicator — Bel-Art F42031
Flamephotometer — Corning 400
Incubator, Small — Gallenkamp 700 110M Size 2
Incubator, Large — Qualtex 1A36S
Oven, Small — Gallenkamp OVB-300010N Size 1
Oven, Large — Gallenkamp OVB-300-210F Size 3
Serum Sampler, 10ul — Oxford P7000 (urgent)
Serum Sampler, 20ul — Oxford P7000 (urgent)
Serum Sampler, 50ul — Oxford P7000 (urgent)
Serum Sampler, 100ul — Oxford P7000 (urgent)
Serum Sampler, 200ul — Oxford P7000 (urgent)
Reagent Dispenser — Oxford Model R (urgent)
Reagent Dispenser — Oxford Model SA (urgent)
Serum/Reagent Diluter
Microscope with Teaching Head — Olympus BHB-213LS
Mixer, Suspension — Clements 96171
Mixer, Vortex — Gallenkàmp SGP 200 110
Stirrer, Magnetic — Corning PC 353
pH. Meter — Corning 120
Spectrophotometer — Coleman Junior II Model 6/20
Waterbath — Grant JB2 with lid
Immersion Heater — Grant SU5
Water Distillation Unit — Corning 14WSC
Water Storage Units (Carboy) — 20-251 with stopcock
Pump Venturi — Selby 398175
Haemoglobinometer — Delphi
Loop Sterilizers Bacticinerator II — (urgent)
Small Refrigerators for Vaccine Storage (X4)
Disposable Needles Sizes 19, 20, 22 and 26
Syringes 5cc and 2cc and Gauzes for Immunisation
Nutrition Scales (not bathroom scales but heavy duty of the type supplied by Avery — 3901 AAG Portable Platform Scale)
Autoclave High Pressure Electric (X6)
Clements Suction Pump — Electric (X6)
Various linens — white calico and blue and white check for covering trays, beds and pillows.

INSTITUTE BUSINESS

Office-Bearers of the N.Z.I.M.L.T. 1988-1989

President
W.J. Wilson
Auckland Regional Blood Centre

Vice-Presidents
D. Dixon-McIver
P. McLeod

Secretary
B.T. Edwards
Haematology, Christchurch Hospital

Treasurer
D.M. Reilly
Diagnostic Laboratory, Auckland

Council
E. Norman, S. Gainsford, J. Parker, J. Le Grice, G. Rimmer

Editor
D. Dixon-McIver
Biochemistry Dept., National Women's Hospital, Auckland.
or the Editor, P.O. Box 35-276, Auckland, 10.

Membership Convenor
Geoff Rimmer
P.O. Box 29-115, Greenwoods Cnr, Auckland.

Membership Fees and Enquiries

Membership fees for the year beginning April 1, 1988 are:

For Fellows — $104.00 GST inclusive

For Associates — $104.00 GST inclusive

For Members — $52.00 GST inclusive

For Non-practising Members — $33.00 GST inclusive

All membership fees, changes of address or particulars, applications for membership or changes in status should be sent to the Membership Convenor at the address given above.

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

1988 Presidential Address
W.J. Wilson

Last year Colvin Campbell reported that it was "the time for change" and today I can advise that now is the time for action. Today we must decide three questions, each on its own is of considerable significance.

This year new legislation was enacted which required major changes in the State and Health Sectors. Some of these have already impacted on us and your decision as to the type of industrial organisation best suited to our industry will be a direct result of this legislation. Your decision will change the role of this Institute forever and the chosen union structure will take this profession through to the next century.

It was in 1946 that the first national conference of the then NZ Association of Bacteriologists was held and it heralded the establishment of a new and independent profession, the origins of which go back to the beginning of this century. I suggest that now 50 years on we are ready to publically defend our existence and advertise our contribution to the Health Service of New Zealand.

Today we must also confirm our commitment to registration of our profession. In doing so we acknowledge publically that we accept responsibility and accountability for our actions individually and jointly and while we have had registration since 1974 I suggest that if Medical Laboratory Technology is confirmed as providing a special public service then all those engaged in it, technologist or scientist alike must be accountable for the work that we do in the patient's interest. The 1988 Royal Commission into the management of cervical cancer at National Womens Hospital has identified that crucial areas of the health service appear to have forgotten why we are here. Central to our very existence is the patient and because of the very specialised nature of the work that we do, and that the public do not and probably will never be able to assess the value of what we do, we have the added responsibility of being charged with determining what is in the patients best interest. Thus the importance of registration together with accreditation cannot be over emphasised. If we are to remain a credible profession with the public then these requirements are fundamental.

Today the buzz words are "user pays" and "efficiency" and are used by the authorities to require us to review our present practices and make improvement where appropriate. This practice is not new to our industry as our development has always been based on assess, implement and review. Indeed if this were not so then automation would not have been introduced. However, we must be judged by our performance and not merely our presence and I for one suggest that we are one sector of the Health Service in which there is much room for rationalisation. It is futile and indeed irresponsible to deny that there is no room for improvement in our industry and I charge each of you when faced with proposals for change to stand back and while not forgetting your personal position consider also the value to the public and the Health Service as in the final analysis it is the public who are paying your salary. It is better that we be involved and influence change rather than taking the ostrich approach and having changes inflicted on us. Our industry is a multi-million dollar concern and when considering cost efficiency the past has shown there are substantial cost savings in automation especially if such equipment is operated 24 hours a day, 7 days a week. The very transportable nature of the specimens we analyse makes us an ideal industry for centralisation. This together with the rapid advancements in bedside technologies places the small manual laboratory under serious threat.

However, as a profession it is also our role to ensure the singular drive for more efficiency is not at the expense of reductions in standards in the precision and accuracy of the tests we undertake and that public access to necessary laboratory testing is maintained. I expect that more and more as a profession we will be involved in defending the public interest as it is us alone who have the knowledge to assess the full impact of changes on medical laboratory practice and when it is clear that patient safety or access to proper laboratory services is to be denied then it is our responsibility to publically challenge those who promote such changes.

Today also we must review our training programmes in the interest that the technologists who will take this profession through to the next century are properly prepared for the technologies and practices of the 1990's. In this event I ask you to consider the needs of the future and not only failings of the past and again consider the public interest as it is their representatives who must be convinced that our recommendations are not only appropriate but justified.

Last year we discussed the need for a restructure of our Institute and directions were given to Council to implement the changes. However, the changes to the industrial legislation earlier this year directly affected the role of the new structure and it was considered that the priority must be to establish the Union organisation then restructure the professional association.

Finally I must thank your Council who this year have had to concentrate on the legislative changes and to properly represent your interests have unselfishly worked long hours and devoted much extra time in the preparations of formal submissions to the various bodies and committes charged with determining the changes which will impact on our profession.

Address to the New Zealand Institute of Medical Laboratory Technology Conference

Mr Peter Dunne MP, Parliamentary Under-Secretary to the Minister of Health

Your Worship, Mr President, Ladies and Gentlemen,

I am very pleased to have an opportunity this morning of talking with your about some of the changes that are now taking place in our public health system. As Under-Secretary for Health, I am constantly aware that advocacy of a publicly funded health system carries with it a responsiblity to point continually out that such a system cannot be expected to provide all things to all people. Public health systems have never been able to deliver what they seem to promise. We delude ourselves if we think that they can.

In our public hospitals we have a standard and quality of free treatment and care that probably is not matched anywhere. We should be proud of that. But the truth is that even if we were to pour another $500 million into our hospitals, they still would not be able to do all the things that people would want them to do. Stated simply, the demand for health services is growing faster than our ability to meet it.

I have a responsibility to be honest about the limitations of the public hospital system. It is not perfect. I accept the analysis by the Taskforce on Hospital and Related Services that there is considerable room for improvement in the way in which public hospitals deliver their services to the community. There are also shortcomings in their management structures, which I want to see addressed.

I note that your Institute supports the general thrust of the taskforce report. The taskforce argues that hospitals need the incentive of the market (or at least a limited market) in order to perform. However, while I accept the need for radical change to our public health system, I do not believe we need to alter the whole structure of the health service to achieve significant improvements in efficiency and service delivery. My particular concern is to improve the quality and accountability of management in the public hospital system. In that way, I believe we can best address the issues raised by the taskforce. Specificly, I note your Institute acknowledges that substantial savings can be made with the laboratory service. I think that savings from improved efficiency in laboratory services are to be expected as hospital and area health boards improve their management information services. The implementation of the Resource Utilisation System in some hospitals has already provided opportunities for improved utilisation of laboratory services once the cost and use of specific services is identified.

The State Sector Act has already started the process of management improvement by stressing the accountability of managers for quality services. General managers of boards now are responsible both for the management of the services provided by their boards and also responsible for meeting the

health needs of the communities the board serve. These responsibilities will require the setting up of methods of assessing the need for services and accountability for the quality, output and outcome of services provided. It is the incentive approach advocated by the taskforce, if you like. The elected members of area health boards will be concerned more with the needs of their communities and less with the day to day delivery of the services. In future, the administration of laboratory benefits and other benefits associated with primary health services may become a task of area health boards — something supported by your Institute.

Now, the local hospital or area health board has the sole responsiblity for deciding priorities for the provision of health services in the community. It also has the responsibility for allocating funds for those services. In this process the Government's role is to decide the overall level of funding for the Health sector, and allocated that to Boards accordingly. In addition, the Government only provides separate funding for services which cannot be readily provided by individual boards. Cardiac surgery is an example. Here, funding is only for the cost of additional operations performed above a base level carried out from within the board's normal level of funding.

A recent legislative change now enables boards to charge other hospital or area health boards for certain types of services (approved by the Minister of Health) provided to other boards. I am aware that one or two of the larger boards are considering seeking the Minister's approval to charge other boards for services they provide to them, which are not covered by the existing funding formula. Some of the services provided to patients from other boards include a large component of laboratory costs. The boards paying for these services are going to be concerned to ensure that they are paying a fair price for the services they are receiving. This will place some pressure on boards to ensure that their laboratory services are efficient, and those that do not have good management information systems will be advised to consider and improve them.

As you know, the Minister of Health is currently giving priority to the formation of area health boards throughout the country and to the better integration of primary health services with hospital and health promotion responsibilities. Under the Area Health Boards Act, area health boards are responsible for the effective co-ordination of all health services provided by public, private and voluntary agencies. In this context, I should make it clear that the Regional Health Authority concept proposed by the Gibbs Taskforce will not be proceeded with because it introduces an additional administrative layer into the management of health services. Also, regional health authorities run the risk of being are too remote from the communities they are meant to be serving. Moreover, a properly run area health board should be able to achieve the same goals the taskforce proposed for regional health authorities, and I do not see such boards as in conflict with the taskforce's recommendations.

Already we have six area health boards in New Zealand — in Northland, Taranaki, Wanganui, Otago, Nelson and Marlborough. It is most likely that another three boards will be set up this year — in West Coast, Southland and Tairawhiti (Cook/Waiapu). Other boards are expected to be established by early next year covering the Auckland, Palmerston North, Wairarapa, Wellington and Canterbury areas. Detailed discussions are continuing in every other area. Members of your Institute will have taken an interest in the recent Cartwright Report on Cervical Cancer. This is another illustration of our hospital system not functioning in the way the public would expect it to do. You will be aware that, in response to Judge Cartwright's findings, the Department of Health has been directed to give priority to putting in place as soon as possible a national cervical screening programme. It has asked all public and private laboratories for information which will help it to plan for future screening requirements.

The returns from laboratories will be received early next month and will provide data on the number of cervical histopathology specimens seen per year, the number of women who are being screened now, as well as the number of smears for each women in a year. At the moment it is very difficult to know what the long-term needs might be for a national screening programme, because we simply do not know how many women are currently being screened. Even before the Cartwright Report was presented to the Minister of Health, the Department of Health had made some plans to improve the immediate need for improved resources in this area.

Over the next three years, some $240,000 will be directed to three 12-week training courses for cytology laboratory assistants. I know your organisation holds some reservations about the wisdom of training laboratory assistants when laboratory technologists would like significant improvements in their resources for training. However, the Government believes an improvement in current resources is needed now in order to respond to the anticipated increase in the numbers of women who are rightly taking responsiblity for their own health by having a smear test.

The results of the laboratories survey and the response to the national screening programme will give us a better idea of the future needs for assessing cervical smears.

Before I leave the subject of the Cartwright Report, let me say this. The findings of this report go far beyond the specific situation at National Women's Hospital. They affect all health workers, whatever their status and whatever the hospital or institution they work in, as well as all patients, particularly women. We have the right to expect high ethical standards in all forms of medical practice, full respect for the rights of patients and full disclosure to patients of the procedures to be applied to them, as well as the obtaining of the explicit prior approval of patients of these procedures. That is the real Cartwright message and I think we would all be gravely in error if we assumed that it applied to National Womens Hospital only.

I also want to take this opportunity of raising with you, the issue of the deregulation of some occupational groups. As your members will be aware, the Government has embarked on a comprehensive review of occupational regulation. As part of the Government's overall review of social policy, the monopolistic practices of professionals will come under close scrutiny. A working group of officials has been directed to undertake this task. It will be reviewing occupations on a case by case basis. A subcommittee of this working group is looking at occupations covered by the Medical and Dental Auxiliaries Act 1966. I know that your Institute has been asked to provide the subcommittee with certain information about your occupational group. You might well ask, "what protection does the consumer have if occupational groups are deregulated?" The answer is quite simply: The Government believes that some form of protection for the consumer is needed.

However, it does not consider that occupational groups should enjoy an unfettered monopoly over the services they provide to the public. The Government is looking not so much at deregulation but at what form occupational regulation should take. We have to ask the question: "Who is being protected — the occupation or the consumer?" There are two types of regulation. First there is a general form of regulation. This involves the application of general laws such as, common law, criminal law, and such statutes as the Commerce Act, Contractual Remedies Act, Contractual Mistakes Act and Fair Trading Act, to occupations.

Secondly, there is specific regulation such as certification and licensing. Under certification, an authority is given the power to certify to the public that individuals have met particular minimum education or training requirements and are adjudged as having competence within a range of professional services. Certification typically involves exclusive ownership of a generic occupational description. However, those persons who are not certified, are not legally prevented from offering their services in competition to those who are.

Licensing is quite different. Only individuals licensed after attaining prescribed educational and training standards are legally permitted to offer their services. This is the most restrictive form of regulation. The practical effect of these controls is to protect lifestyles by creating closed shops and shutting out competition from others. Consumer choice is severely restricted. As a consequence, innovation is

constrained. Certification and licensing are not uniform across all the trades and populations. We have to ask ourselves questions about these schemes:
— What is their purpose?
— Is it being achieved?
— Is the control being exercised in the interests of the occupational group or the consumer?

These are the questions the working group on occupational regulation has been asked to address. I trust your institute will assist the working group in its task. There are many changes taking place in every aspect of our lives. Health services are no different. What we need is for everybody to look for ways of becoming more effective in the ways in which they deliver their services.

Membership Sub-Committee Report — August 1988

Since our May meeting there have been the following changes:

	31.8.88	27.5.88	16.3.88	19.11.87
Membership:	1499	1465	1506	1534
less resignations	8	21	21	10
less G.N.A.	14	10	32	28
less deletions	—	—	163	—
less deceased	1	—	—	—
	1476	1434	1290	1496
plus applications	77	65	173	10
plus reinstatements	—	—	2	—
	1553	1499	1465	1506

Applications for Membership

Mrs Trina SMITH, Auckland; Miss Deborah VICKERS, New Plymouth; Miss Elizabeth CULHANE, Lower Hutt; Miss Wendy JORDAN, Lower Hutt; Miss Dianne NICHOLSON, Napier, Mrs Angela FAGG, Timaru; Ms April PETERU, Auckland; Miss Sarah PERRY, Auckland; Mr Robert BAILEY, Auckland; Miss Claire BOWERING, Auckland; Mr Lance LITTLE, Auckland; Mrs Margaret GENTIL, Auckland; Ms Kay MCDONNELL, Auckland; Miss Leone IONA, Auckland; Miss Andrea TREMAIN, Auckland; Mrs Susan BROOKS, Thames; Mrs Brigette HUGHES, Thames; Mrs Dinah WARREN, Thames, Ms Elizabeth CABLE, Tauranga; Mrs Jane BOLTON-HALL, Gisborne; Mrs Lorna REEVE, Gisborne; Miss Linda APPLEYARD, Gisborne; Miss Fiona HORNE, Gisborne; Mrs Patricia COLE, Gisborne; Miss Patricia CARMODY, Gisborne; Miss Glenda JUDD, Gisborne; Mrs Jillian DOOLEY, Auckland; Ms Elizabeth KEIGHTLEY, Wellington; Mr Darren JAMES, Auckland; Mrs Yvonne BELL, Tokoroa; Mr Norman DUXBURY, Dunedin; Mr Walter ROSE, Dunedin; Mrs Judith ANDERSON, Invercargill; Miss Marie COPELAND, Timaru; Miss Leone BARRETT, Rotorua; Ms Karen NIXON, Lower Hutt; Mrs Sandra SHARPE, Rotorua; Mrs Anne KEAST, Invercargill; Mrs Raewyn STEAD, Thames; Mrs Jennifer CALLISTER, Dunedin; Mrs Catherine STEVENS, Dunedin; Miss Toni TUNGATA, Rotorua; Mrs Irene BROWN, Invercargill; Mr Murray MACDONALD, Hastings; Miss Lynette SUDFELT, Hastings; Miss Julie STANIFORTH, Hastings; Mrs Janet HORNE, Whangarei; Miss Jennifer TRUSTUM, Palmerston North; Miss Mandy WARNER, Hastings; Mrs Margaret DAVIDSON, Hamilton; Mrs Barbara TURNBULL, Auckland; Mrs Alison FYFE, Auckland; Ms Pamela DONOVAN, Rotorua; Ms Jane EPPLETT, Hastings; Mr Warren MATTHEWS, Napier; Mrs Bettina NEWSOME, Christchurch; Miss Jennifer FERGUSON, Hamilton; Miss Dianne LEATHWICK, Timaru; Mrs Maureen O'FEE, Timaru; Mrs Kay TOOMEY, Timaru; Miss Leone KARL, Auckland; Mrs Rosemary JOHNS, Auckland; Miss Linda AH TONG, Auckland.

Applications for Associateship

Mr Peter JONES, Auckland; Mr David RUCK, Thames; Mr Peter CLEAVE, Auckland; Mrs Denise RITCHIE, Auckland; Mrs Janette WEBBER, Whakatane; Ms Maree PHIPPS, Hamilton; Mr Anthony DAY, Hamilton; Mr Christopher NIPPER, Auckland; Mr Frederick SMITH, Wellington; Mrs Susan GAISFORD, Wanganui; Ms Jackie WRIGHT, Whakatane; Mrs Elizabeth LEWIS, Levin; Miss Andrea MOORE, Christhcurch; Mrs Patricia ROSER, Tauranga.

Gone No Address

Mrs Y. HALSTEAD, Australia; Mr R. COOK, Christchurch; Miss M. CORNELL, Auckland; Miss J. RUSSELL, Auckland; Mrs D. FARR, Auckland; Miss L. BLOORE, Hamilton; Mrs K. TAYLOR, Christchurch; Mrs A. NEVILLE, Christchurch; Miss V. VAN TILBURY, Auckland; Miss T. SMITH, Dannevirke; Miss L. ANDREWS, Auckland; Mr A. JOHNSON, Auckland; Mr T. STROUD, Auckland; Miss N. WRIGHT, Auckland.

Resignations

Mrs R. PARNHAM, Lower Hutt; Mrs J. MCLEAN, Auckland; Miss G. GARDNER, Palmerston North; Miss B. ARAHILL, Gisborne; Mrs H. WYNN, Auckland; Mrs J. WADDINGHAM, Christchurch; Mrs C. EBBETT, Hamilton; Miss T. LAURIE, Palmerston North; Mrs M. LORNEY, Hamilton; Miss E. POOLE, Dunedin; Mrs L. RAINBOW, Auckland; Mrs C. HARRIS, Nelson.

Course Announcement

Introduction to Molecular Genetics and Gene Manipulation. A one week non-credit introductory workshop will again be conducted in the Microbiology and Genetics Department of Massey University during the first week of the May Holidays 1989 (8-12 May). The aim of the course will be to provide for those people who may have a potential professional interest in the subject, a working introduction to the powers and limitations of the techniques. Lecture topics to be covered will include the molecular genetics of plasmids and transposons, basic strategy of recombinant DNA research (both basic and applied) and the quasi-legal aspects of "genetic engineering" Practical work will include plasmid crosses, transposon mutagenesis, plasmic isolation, restriction enzyme mapping and DNA ligation. Background assumed will be the equivalent of Introductory Genetics and Introductory Biochemistry (200-level).

Although Boehringer-Mannheim have agreed to sponsor this course, there will be a charge of $200, in order to cover the costs of additional materials and facilities. Accommodation will have to be arranged off campus, as unfortunately, Extramural fully books the campus accommodation. The enrolment will be limited to 20 (the capacity of the teaching laboratory). For further information and an enrolment form, please contact:

Dr Eric Terzaghi
Department of Microbiology and Genetics
Massey University
Palmerston North

OBITUARY

Frederick Leonard Nevinson COREY

Fred Corey was born on 12 January, 1919, at Eltham, the son of a Dairy Factory Manager and died on 4 June, 1988. In a span of 69 years he involved himself in many fields of endeavour and had an influence on the lives of many people. His youth and his primary school days were spent at Auroa in rural Taranaki, but the advent of the Great Depression prevented any post-Primary education. His working life started with a brief spell as a farm labourer before he commenced an apprenticeship in a bakery. After qualifying as a baker he remained in that industry until the outbreak of the Second World War when he chose to enlist despite being employed in an essential industry.

His overseas service started in 1941 when he was initially in a catering corp, but he soon transferred to the No. 3 New Zealand General Hospital. During service in Egypt and Italy his interest in laboratory work was first aroused and this interest increased further during a spell in England toward the end of hostilities. Although subjected to the ravages of amoebic dysentery throughout his war service Fred devoured all available literature about the new science of Bacteriology.

For two years after his Army discharge in 1946 he worked as a Landscape Gardener before commencing a Bacteriology Traineeship at Christchurch Public Hospital. Pathologist Dr A.B. Pearson had a considerable influence on him during these training years. Following his qualification in 1952 Fred remained at Christchurch Hospital until in 1956 he moved briefly to Thames and Nelson Hospitals before again experiencing a major health problem. As before, he turned to nature during his convalescence and worked for two years in a New Plymouth horticulture nursery.

In February, 1957, Fred married Margaret Brown who was also a Qualified Laboratory Technologist and over the years their family increased with the arrival of Kathryn, Fiona, Donald and Angus.

In mid 1959 the call of Technology once again lured Fred to the Biochemistry Department at Christchurch Hospital and in the early 1960's he took up the position of Charge in Biochemistry at Pearson Laboratory where he oversaw the running of a rapidly changing and expanding department. He remained at Pearson Laboratory until his retirement in 1981.

Fred considered his work to be the most important aspect of his life and he devoted himself fully to his profession. He served from 1956 to 1958 as Regional Representative on Council and for a period of time he and John Cannon co-edited the Journal. He was always interested in Institute affairs and was for many years actively involved in the Christchurch Branch.

His contribution to Technology was recognised in 1968 when he was awarded a Fellowship by order of Council.

Outside work he found himself involved in a wide range of activities. Through his lifelong interest in horticulture he became involved in climbing and tramping and was a very accomplished photographer, especially of alpine plants and flowers.

The Church played a real and meaningful part in his life and he participated in many Church related activities. Fred always took tremendous pride in his family and willingly became involved in school committees, the Girl Guide movement, coaching junior sport and the numerous other activities associated with a growing family.

After retirement he joined the Probus Club, expanded his interest in wine making and joined a wine club and devoted much time to gardening and landscaping, both for himself and others.

The wide range of his interests and involvements brought him into contact with people from all walks of life. All were of interest and all knew that he was a willing and valuable source of help or advice. As a consequence there were times when the clock was very much of secondary importance and when 24 hours in a day were not enough. Almost certainly as the result of his lack of formal education Fred was left with a real thirst for knowledge and with the need to be fully aware and informed of all that he became involved in. He often became hesitant and uncomfortable if required to make decisions in the absence of all relevant information.

Fred Corey was a devoted family man, a respected professional colleague and a real friend to many people with whom he came in contact. He was a man of honour, a man of integrity and a humanitarian. He has enriched the lives of many who knew him and his passing has left the world a poorer place.

Fermentation Technologies: Industrial Applications

An International Biotechnology Conference — Massey University, Palmerston North, New Zealand

12 — 15 February, 1990

FIRST ANNOUNCEMENT

The Biotechnology Department, Massey University in collaboration with the Biochemical Processing Centre, DSIR (Biotechnology Division), Palmerston North, New Zealand is organising an international Biotechnology Conference on the theme Fermentation Technologies: Industrial Applications.

The past decades have witnessed remarkable progress in those technologies that service the fermentation industries. There remains a gap between the advancement of scientific knowledge and its industrial application. This conference focuses on the new development of fermentation technologies and the application of them to industrial production of useful products. Topic areas which are being covered includes microbial fermentation, yeast fermentation, fermenter technology, downstream processing, process development, product separation and recovery bioindustries, impact of biotechnology etc.

Further information and registration form, please contact: Conference Director
Biotechnology Department
Massey University
Palmerston North
New Zealand

WORK WANTED

Trainee Technologist or Laboratory Assistant Position Wanted

An Iranian Graduate is seeking a position in a New Zealand Laboratory which would allow him to seek limited registration. A C.V. is available on request. Please write to:

Masoud Azemoudeh
Bendary Shazand, Shazand, Arak, Iran

Medical Laboratory Technologist Clinical Chemistry Speciality: DNA-technics

I am a twenty-four year old woman with a Swedish Med Lab Techn training.

I have been working at Lunds University in Malmoe since 1986.

My speciality is DNA-technics including Southern Blot and plasmid preparations.

I have further education in clinical chemistry and biochemistry.

I am well acquainted with the English language and very interested in getting a short term or a long term employment in any part of New Zealand.

For further information, please write to:

Linda Ankrell
John Erikssons väg 76
217 61 Malmö
Sweden

Phone number in Sweden is 040-267607.

I will be available in New Zealand from 28 December 1988 to 17 January 1989.

NEW PRODUCTS AND SERVICES

FLUORESCENCE MICROSCOPY: NEW FILTER SET FOR PHYCOERYTHRIN

Phycoerythrin belongs to a family of a natural proteins which fluoresce intensely. Although of equal molarity, phycoerythrin is approximately 50 times easier to detect than fluoresceine and rhodamine derivatives. In addition, phycoerythrin conjugates with antibodies have a 5 to 10 times higher sensitivity than fluoresceine and rhodamin labelled congregates.

Developed chiefly for R-phycoerythrin, Carl Zeiss has now available for their AXIOSKOP and AXIOPLAN range an especially tuned filter set No. 20. This new high performance filter set is equally well suited for double fluorescence techniques such as immunofluorescence-histochemical test kits.

For further information, please contact: Carl Zeiss (N.Z.) Pty. Ltd., Mayfair Chambers, The Terrace, Wellington. Ph: 724-860, 724-861, Telex: 31487.

A CONCEPT THAT CARRIES WEIGHT: PORTABLE SERIES BALANCES

Sartorius has recently released an expanded range of electronic portable balances. Known as the PT series the new balances combine ease of use, reliability and versatility in a highly integrated package.

As a "weighing" balance, the Sartorius Portable is very simply to operate; two touch-control keys, one for turning the balance on and off and the other for automatic full range taring are all that are required. The unique linear range display, with divisions in percent, shows you at any time the amount of range you have left.

As the name suggests the new balances are easy to carry (total weight 2Kg) and when used with the optional rechargeable battery pack, described later in this article, can be operated anywhere, ranging from the laboratory to field studies or even the factory floor. Highly integrated electronics result in interference free weighing and a stabilisation time of 1.5 seconds, regardless of operating conditions. Each balance has three menu selectable filter level settings to ensure optimal weight readouts.

Tailor made application programs come built into the balance and are menu selectable. Easy to understand LCD display prompts guide you in; over/under check weighing, parts counting, weighing in percent, net total formulation and mass unit conversion.

Equipped with an optional RS-232-C unidirectional interface the Sartorius Portable can transfer all weight data to a serial data printer of a PC. It can also be integrated into an existing automated weighing system.

The optional rechargeable battery pack allows up to 20 hours of operating power without having to rely on a mains power supply. The batteries are rechargeable without having to remove them from the balance; simply use the mains power adaptor and the rest is automatic.

The new range consists of 4 models with capacities ranging from 121g to 6,100g with readability down to 0.1g.

Sole New Zealand agent for the Sartorius range is the Wilton Instrument Division of Salmond Smith Biolab, PO Box 31-044, Lower Hutt, phone (04) 697-099.

TOTAL QUALITY CONTROL FROM SARTORIUS

The new "QT series" balances have been designed specifically for checking weights and quantity at all stages of the production process in any industry without interference from the ambient environment.

As a weighing balance the Sartorius Quality couldn't be easier to use; two touch-control keys, one for turning the balance on and off and the other for automatic full range taring are all that are required. There are four models in the range with capacities ranging from 3,100g to 12,100g with readability down to 0.1g.

Ergonomic design combined with advanced integrated electronics has resulted in a balance that is compact and lightweight with a large flat pan, ideally suited to industrial applications. When equipped with the rechargeable battery pack the balance can be set up and used virtually anywhere.

Tailor made application programmes come built into the balance and are menu selectable. Easy to understand LCD display prompts guide you in, parts counting, check weighing, weighing in percent and net total formulation. Depending on your requirements you can select the readout that best suits your needs from a wide variety of international mass units.

The optional rechargeable battery pack allows up to 20 hours of operation without having to rely on a mains power supply. The batteries are rechargeable without having to remove them from the balance. Simply use the mains power adaptor and the rest is automatic.

When equipped with the optional RS 232-S interface the Sartorius Quality can transfer all weight data to a serial printer or to a remote checkweighing display that allows efficient and effortless checking of bulk quantities.

For further information please contact the Wilton Instruments Division of Salmond Smith Biolab Ltd, PO Box 31-044, Lower Hutt, phone (04) 697-099.

NEW TESTS DETECT MOST COMMONLY ABUSED DRUGS

Du Pont has announced the development of new

automated tests for the detection of the six drugs most commonly abused.

Used in conjunction with Du Pont's "aca" discrete clinical analyser, the tests will reveal the presence of amphetamines, barbiturates, benzodiazapines, cannabinoids, cocaine and opiates in the body.

These Du Pont "aca" tests are expected to provide important assistance in emergency rooms where physicians need fast, reliable information when treating accident victims who may be under the influence of drugs. The new tests can be completed in about seven minutes.

There are more than 5,000 "aca" analysers in use worldwide. These drugs of abuse tests will expand the utility of these important clinical laboratory instruments. Du Pont currently offers about 70 test methods of use on its "aca" analyser.

The analyser is one element in Du Pont's portfolio of research, diagnostic and therapeutic health care products that generated sales of U.S. $1.2 billion in 1986. Please contact Du Pont (New Zealand) Ltd, phone (09) 277-8080.

WESTERN BLOT TEST KIT HAS PREDICTIVE VALUE IN AIDS TESTING

The Biotech/Du Pont HIV Western Blot test kit is the first of its kind to be licensed by the FDA for use in detecting antibodies to the AIDS virus. While research versions of the tests have been available since AIDS antibody testing began in 1985, the licensed Du Pont test kit now enables blood centres, hospitals and independent labs to institute their own Western Blot testing programs.

The Western Blot test determines if an antibody positive finding by the ELISA tests used to screen donated blood is true positive or a false positive. At the same time, Western Blot provides a physician with information about the presence or absence of specific antibodies that may enable a prediction of the time frame when a healthy antibody-positive person will develop the disease.

This test kit is a joint development of Biotech Research Laboratories and Du Pont. Please contact Du Pont (New Zealand) Ltd, phone (09) 277-8080.

NGAIO LABORATORIES

Ngaio Laboratories are pleased to advise that they have been appointed exclusive New Zealand Distributors for Biocientifica SA, a major South American manufacturer of Immunodiagnostic Products. The range of products includes immunofluorescent and immunoperoxidase kits, latex screening kits and RID Plates.

Many laboratories use RID Plates routinely, they are a very cost effective way to quantitate proteins without using valuable analyzer time. Biocientifica SA Plates are very cost competitive compared with others available and they also offer the following advantages.

Combiplate Option — Four wells each of IgA, IgG and IgM in a single plate. No more partly used plates, ideal for large and small laboratories.

Free Control Sera — Orders of more than 14 plates are supplied with a set of three level control sera.

Worksheet — With every plate. Suitable as a permanent record, includes details of plate range, normal ranges, calibration table and graph paper on reverse if required. No more searching for the current calibration chart.

Excellent Correlation — With RID plates currently available.

A wide range of plates are available including Apolipoprotein A-1 and Apolipoprotein B.

Plates currently available:
Diffu-Plate IgA, IgG, IgM
Diffu-Plate IgA
Diffu-Plate IgG
Diffu-Plate IgM
Diffu-Plate C-3
Diffu-Plate C-4
Diffu-Plate Alpha-2 Macroglobulin
Diffu-Plate Transferrin
Diffu-Plate Alpha-1 Antitrypsin
Diffu-Plate Ceruloplasmin
Diffu-Plate IgA Low Level
Diffu-Plate IgG Low Level
Diffu-Plate IgM Low Level
Diffu-Plate Apolipoprotein A-1
Diffu-Plate Apolipoprotein B
Diffu-Plate Haptoglobin
Diffu-Plate Control Sera (3 x 0.5 ml)

The range of Immunofluorescent Kits produced by Biocientifica SA is extensive and includes Anti-DNA, ASMA, AMA, Anti-Thyroid, ANA, Chlamydia and HIV.

Latex Kits include CRP, ASO, Rheumatoid Factor. An IM screening kit is also available.

Contact Ngaio Laboratories for more information on RID Plates, Latex Test Kits or Immunofluorescent/ Immunoperoxidase Kits.

NEW INSTRUMENTATION "THE QM300 PROTEIN ANALYSIS SYSTEM"

The QM300 Protein Analysis System represents significant advance in immunoassay development. Kallestad Diagnostics U.S.A., present a fully automated microprocessor-based rate "Nephelometer" for quantitating selected serum proteins. It can accommodate 40 patient samples and 12 different test reagents at a throughput of greater than 60 tests per hour. Current tests include IgG, IgM, C3, C4, haptoglobin, transferrin, CRP, alpha$_1$ antitrypsin, prealbumin, ceruloplasmin, rheumatoid factor,
— Apolipoprotein A1
— Apolipoprotein B
— Alphamacroglobulin
— Albumin and alpha acid glycoprotein

By combining Kallestad reagents and temperature controlled optics with cross calibrated multiple flow cells you can rely on proven quality results. The QM300 is a compact benchtop "Nephelometer" measuring 24" x 26" x 28". It is self contained in one unit with the exception of a stand alone CRT and keyboard.

The QM300 is easy to operate a random access "Nephelometer" that will automatically check for antigen excess. It is best suited to laboratories performing a relatively large number of specialised protein analysis.

Marketed by Scientific Products Division, Salmond Smith Biolab Ltd.

AUTOMATIC WASHING MACHINE DETERGENTS AND AIDS FOR LABORATORIES AND HOSPITALS

Gallay detergents are specially developed for use in automatic washing machines and efficiently solves problems associated with washing laboratory glassware, surgical, anaesthetic or dental instruments etc.

Gallay detergents are very efficient and virtually nonfoaming. Developed for use in washing machines located in laboratories, hospitals and clinics, they are readily soluble and emulsify easily to ensure complete elimination of the strongest residues and lime soda. These products may be used with complete confidence on the most delicate laboratory glassware and medical instruments.

They may be used without any risk when safety instructions for handling of household detergents are followed.

All Gallay products satisfy modern standards of waste control and are completely bio-degradable.

The Gallay range of detergents and aids includes: Gallay Clean N, Universal detergent; Gallay Clean S, Disinfecting detergent; Gallay Clean A, Phosphate free detergent; Gallay Oxy Clean, Acid detergent; and Gallay Acid, Rinse aid.

Available from Inter-Med.

ANNOUNCEMENT

bioMérieux

FROM: **SCIENTIFIC SUPPLIES LTD**

SOMETHING PRACTICAL FOR DIAGNOSIS AND MONITORING OF TREATMENT

BACTERIOLOGY
MYCOLOGY
VIROLOGY

- — Culture media
- — Bacterial and viral identification
- — Mycology
- — Antibiotic susceptibility testing
- — Miscellaneous and equipment
- — Tissue culture

HEMOSTASIS
HEMATOLOGY

- — PT APIT
- — Fibrin formation, Fibrinolysis
- — Deficient plasmas
- — Calibration, Control
- — Equipment
- — Hermatology

CLINICAL CHEMISTRY

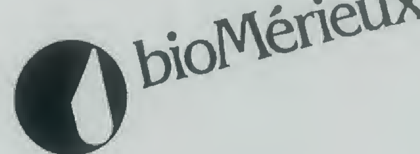
- — Enzymes
- — Substrates
- — Electrolytes
- — Calibration, Control
- — Hormones
- — Marker proteins

IMMUNOSEROLOGY

- — Bacterial, parasitic and viral serology
- — Autoimmune diseases
- — Reagents for IF, CF and miscellaneous

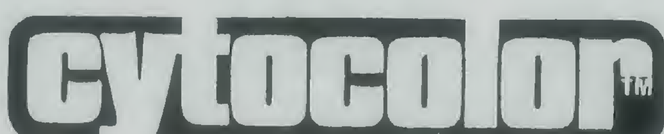
RIA

- — In vitro determination
- — Miscellaneous and equipment

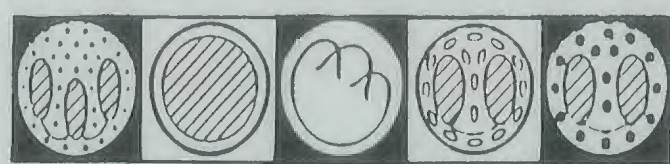


SCIENTIFIC SUPPLIES LTD PO BOX 14-454, PANMURE, AUCKLAND 6. TELEX: 60675AB:SCIENZ.
TELEPHONE: 274-7579, 274-8907 FAX: 274-0267
SCIENTIFIC SUPPLIES LTD 42 FILLEUL STREET, DUNEDIN. TELEPHONE 775-097

INTRODUCING ...



CELL SELECTIVE STAINS FOR HEMATOLOGY



CYTOCOLOUR — a milestone in the story of cell identification with six new stains, identifying cell types by their distinctive colour reactions. Uses in the diagnosis of leukemia and other hematologic disorders.

EASY TO USE — COST EFFECTIVE available from ...

SCIENTIFIC SUPPLIES LTD

PO Box 14-454, Panmure, Auckland 6
Telephone: 274-7579, 274-8907
Telex: 60675 AB: SCIENZ, FAX: 274-0267
OR: 42 FILLEUL STREET, DUNEDIN. Ph 775-097

Giardia

Cryptosporidium

THE NEWLY EMERGING PATHOGENS

Introducing our Monoclonal Antibody Detection Procedures

GIARDIA — This new procedure offers 97.4% sensitivity and 100% specificity.

CRYPTOSPORIDIUM — This new procedure offers 100% sensitivity and 100% specificity.

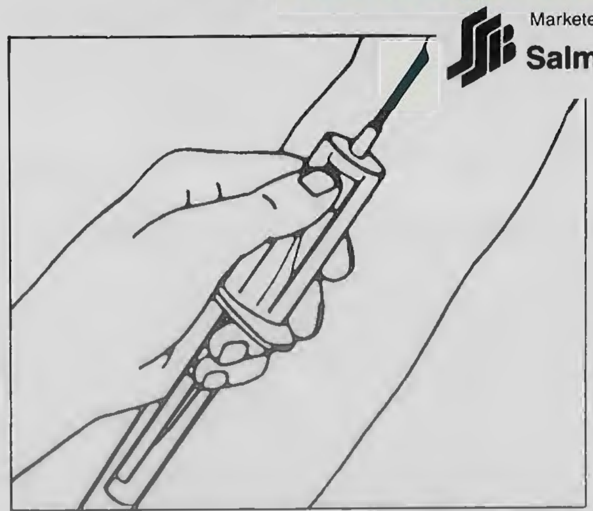
DETECTION WITH UNPARALLELED ACCURACY!

FOR RAPID DIAGNOSIS AND INFORMATION RING OR WRITE

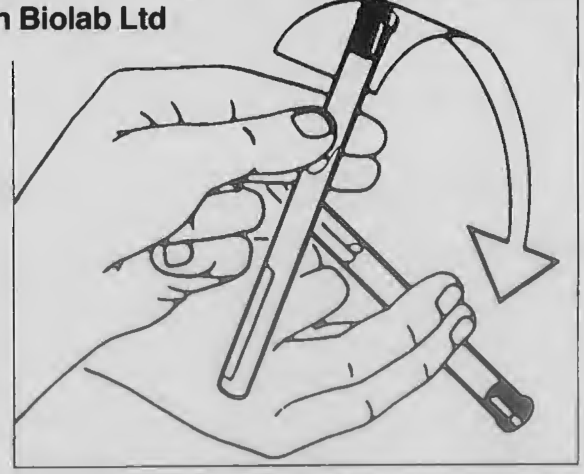
P.O. Box 6848, Auckland
Ph: (09) 563-464, (09) 569-821

THE Seditainer® ESR SYSTEM

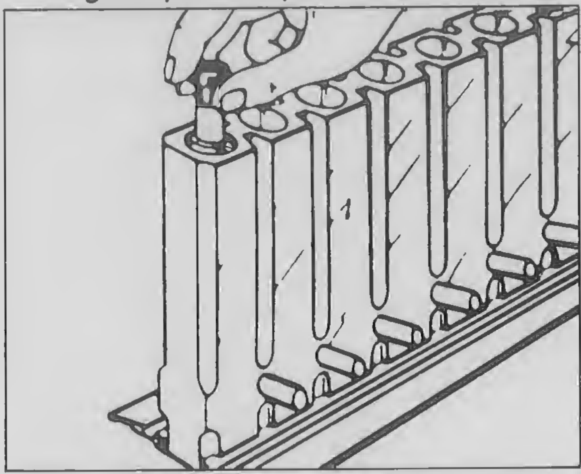
Marketed by Scientific Products Division
Salmond Smith Biolab Ltd



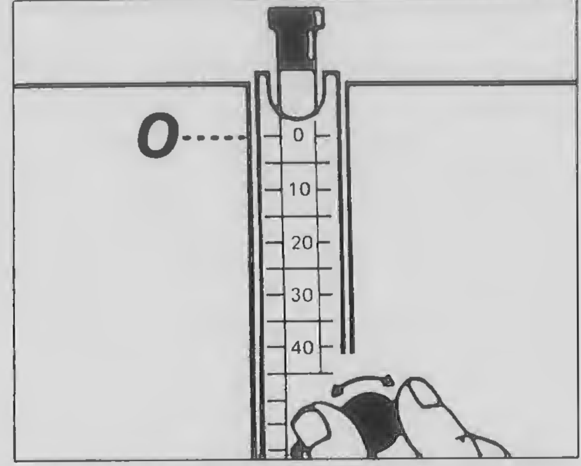
1. Collect blood, with the SEDITAINER® tube, using accepted venepuncture technique.



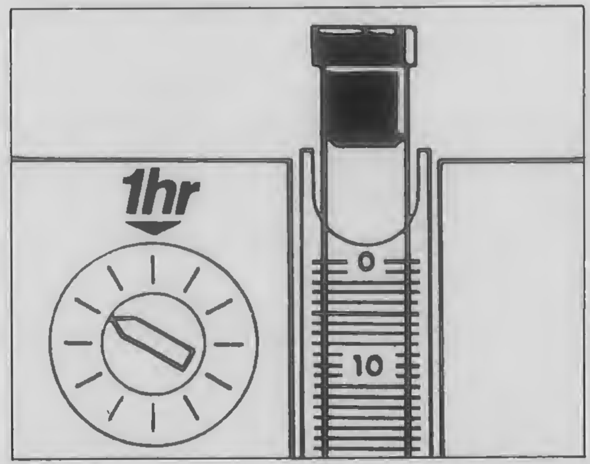
2. Gently invert SEDITAINER® tube at least 10 times.



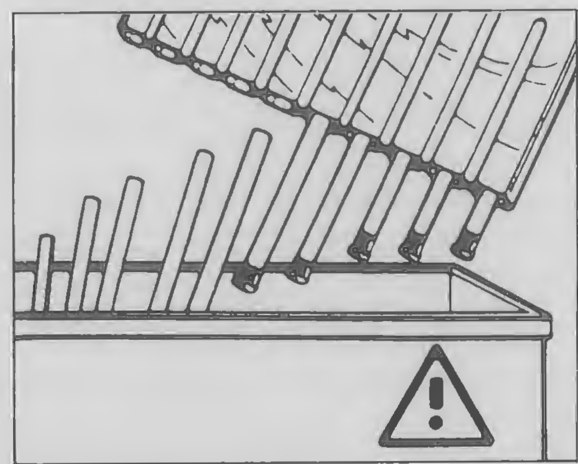
3. Insert SEDITAINER® tube into stand.



4. Align zero level of the adjustable scale to bottom of meniscus.



5. Set timer and read erythrocyte level after 1 hr.



6. Discard SEDITAINER® tubes.

Your SEDITAINER® Evacuated Blood Collection Tube IS your Sedimentation Test Tube.

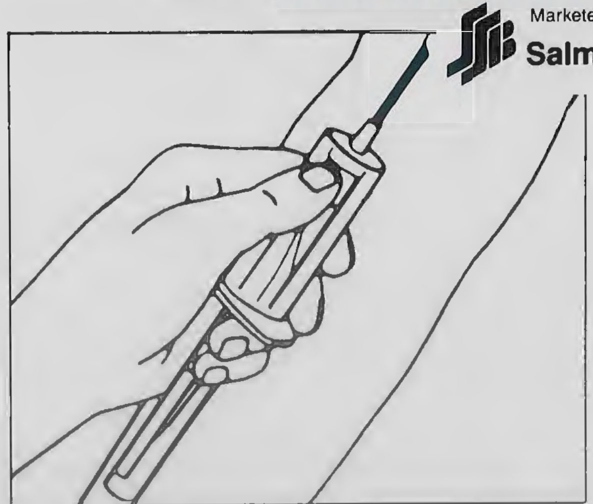
- *No dilution of blood specimen.*
- *No extra Sedimentation tube.*
- *No aspiration of blood sample.*

BECTON DICKINSON

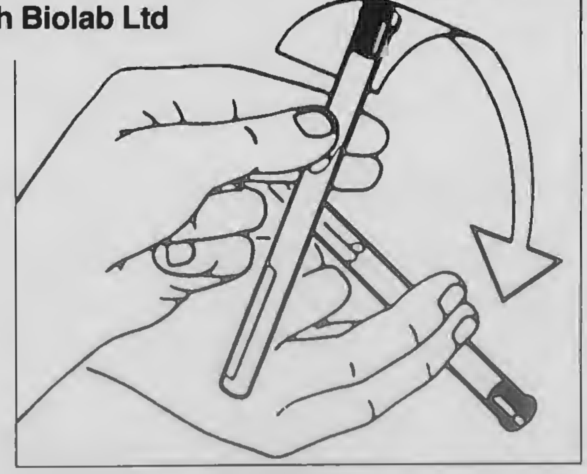
a totally closed system for the determination of E.S.R.

THE Seditainer® ESR SYSTEM

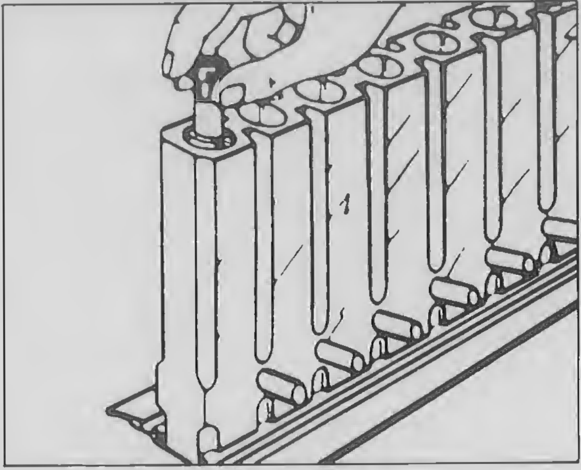
Marketed by Scientific Products Division
Salmond Smith Biolab Ltd



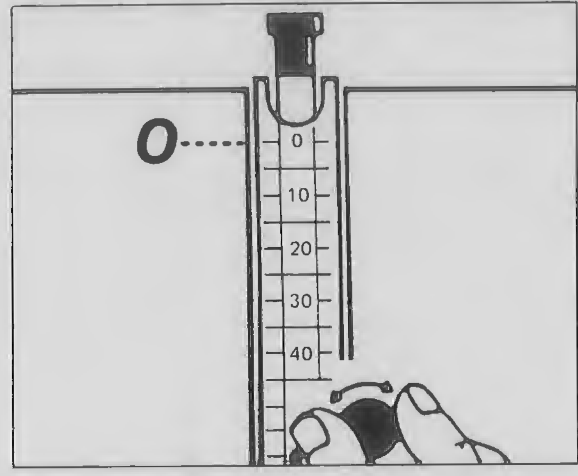
1. Collect blood, with the SEDITAINER® tube, using accepted venepuncture technique.



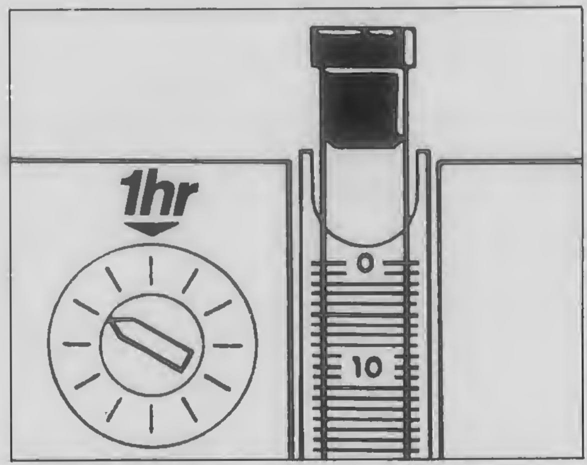
2. Gently invert SEDITAINER® tube at least 10 times.



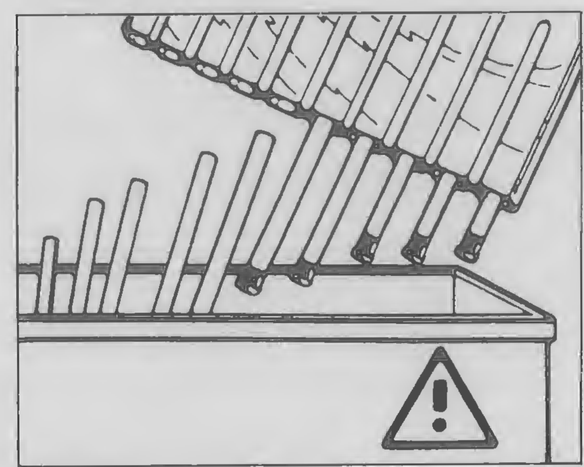
3. Insert SEDITAINER® tube into stand.



4. Align zero level of the adjustable scale to bottom of meniscus.



5. Set timer and read erythrocyte level after 1 hr.



6. Discard SEDITAINER® tubes.

Your SEDITAINER® Evacuated Blood Collection Tube IS your Sedimentation Test Tube.

- No dilution of blood specimen.
- No extra Sedimentation tube.
- No aspiration of blood sample.

BECTON DICKINSON

a totally closed system for the determination of E.S.R.