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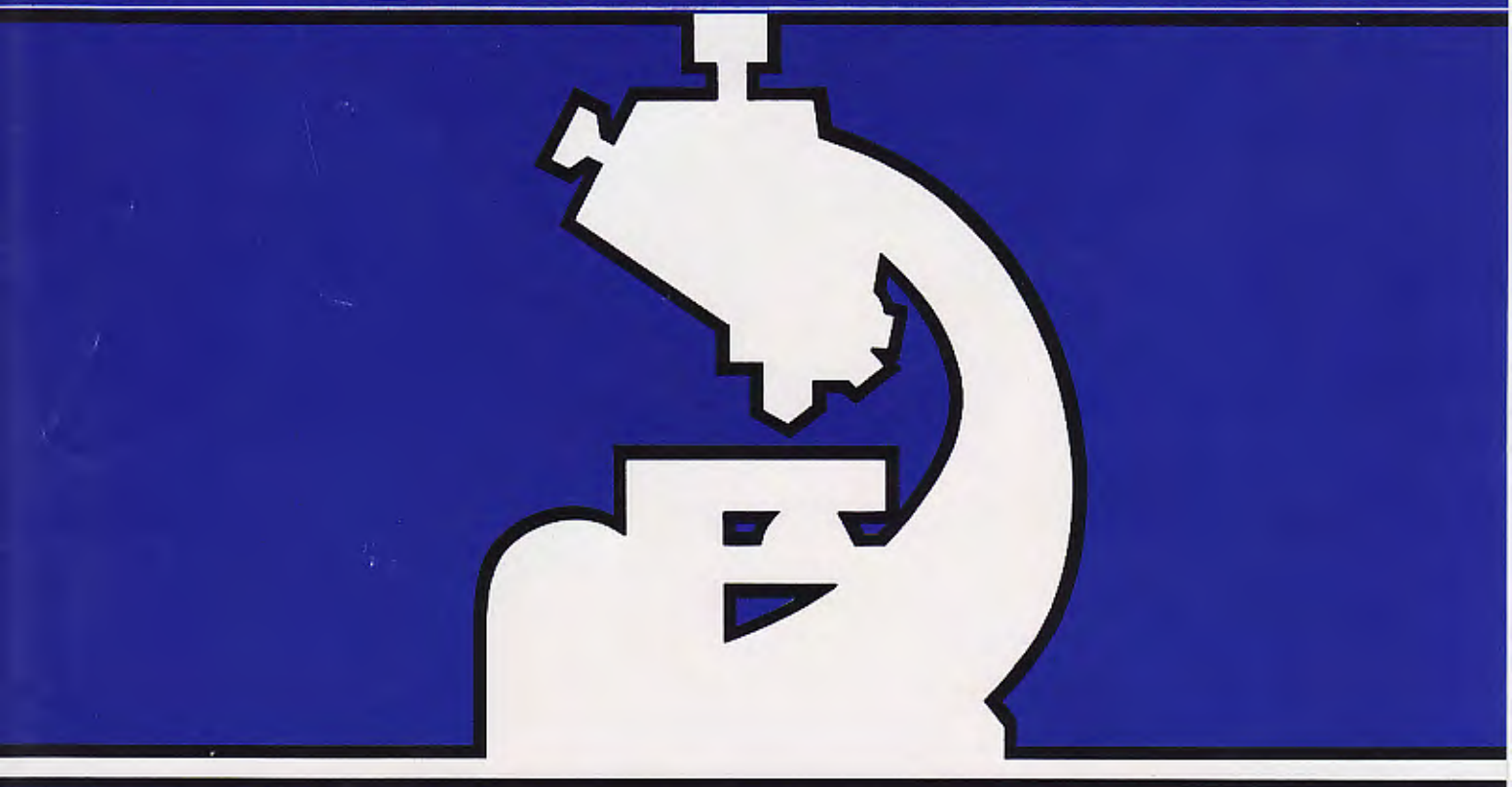

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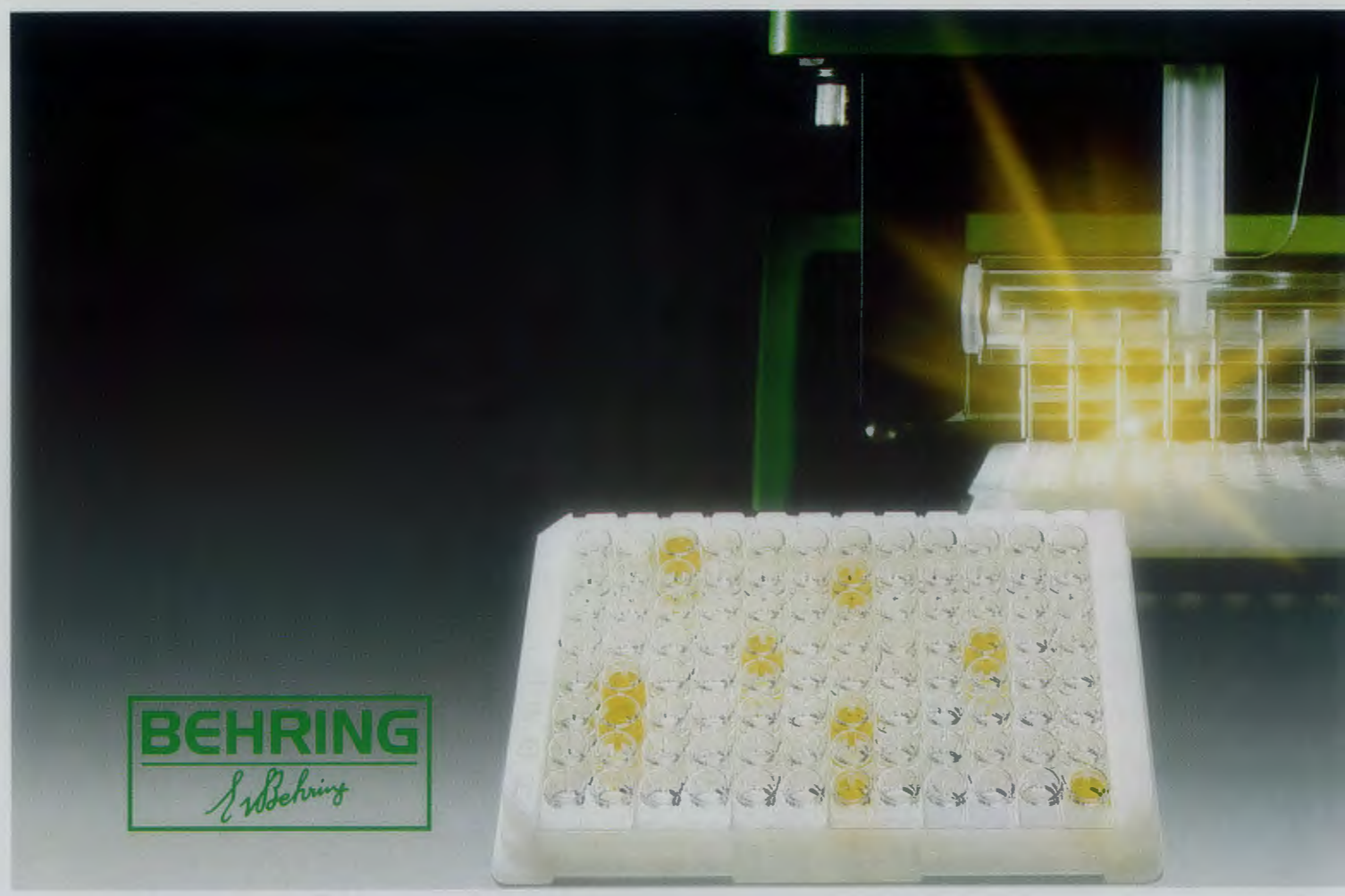

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Diamond-Blackfan Syndrome

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Abstract

Congenital hypoplastic anaemia is a rare haematological disorder. A brief history of Diamond-Blackfan syndrome is presented together with a case history. The history tends to support the theory of the anaemia being inherited, in that the mother was diagnosed as having Diamond-Blackfan syndrome in 1959.

History

Diamond-Blackfan syndrome was first reported by Josephs in 1936, when he found two infants with 'an aplastic anaemia confined to a failure of erythropoiesis'[1]. In 1938 Diamond and Blackfan described in more detail this condition, which they found in four children, and emphasised the features of a chronic progressive anaemia beginning early in infancy with selective hypoplasia of red cell precursors in the bone marrow[2].

The disease has a variety of descriptive names:- Congenital pure red cell hypoplastic anaemia, Primary red cell aplasia, Chronic erythroblastopaenia, Erythrogenesis imperfecta, Josephs Diamond-Blackfan syndrome[3].

Diamond, Wang and Alter performed a study on forty-two patients who were diagnosed as having Diamond-Blackfan syndrome and found the sex ratio was 1:1.

The mode of inheritance is not fully established because in the earlier cases too few victims survived to adulthood and in present studies patients must reach maturity before valid arguments may be made. Claims have been made that it is either autosomal dominant[4] or recessive[5]. The anaemia is definitely congenital as the majority of affected infants were pale from birth or developed the anaemia within two months; 72% of Diamond, Wang and Alter's patients were affected before 4 months of age.

The aetiology is unknown but certain ideas have been suggested. The lack of erythropoietin seems likely but it is present in high levels and is normally active by the usual biological assays. No erythropoietin antibody or blocker has been unequivocally demonstrated. The lack of a 'carrier' for erythropoietin into the embryonic red cell or an absent or inactive enzyme or cofactor has been suggested[3].

Vitamin B_{12}, folic acid and pyridoxine do not appear to be lacking and excess anthranilic acid excretion suggests a metabolic defect in the tryptophan mechanism, although this theory has not yet led to a constructive working hypothesis[6,7].

There is speculation that there are two forms of the anaemia in which

1. erythroid precursors appear to be quantitatively normal but have a relative erythropoietin insensitivity which is corrected with prednisone.

or 2. there is a marked deficiency of number of progenitors or an absolute erythropoietin insensitivity[8].

Clinical Findings

The infants appear pale but are otherwise normal. The haemoglobin falls rapidly and may be as low as 40-50 g/L when the anaemia is first noted. This usually occurs in the first two months of life but it may not be until after six months that the anaemia is discovered. As the infant becomes increasingly anaemic, restlessness and loss of appetite may develop together with hemic murmurs and eventually cardiac failure may occur if the condition is not treated.

In approximately 30% of cases, congenital abnormalities have been reported such as bifid thumbs, double thumbs and two reported cases of a double thumb together with a triphalangeal thumb. Other abnormalities reported have been webbed neck, bone abnormalities of fingers and ribs, inverted nipples and eye changes[9].

Laboratory Findings

A normochromic macrocytic anaemia with absolute reticulopaenia is found in all cases. The red cell count varies with the severity of the disease. The white cell count is normal or sometimes slightly decreased and the platelet count is often mildly elevated. Persistently increased levels of Haemoglobin F are found in these patients and may persist beyond six months of age with levels of up to 25% Haemoglobin F. The i Antigen has been found on the red cells of some patients suggesting foetal type of erythropoiesis. Normally this is present at birth and disappears over the first year as the I antigen increases. Chromosome abnormalities are normally absent although there has been two reported cases of a defect with chromosome 1.

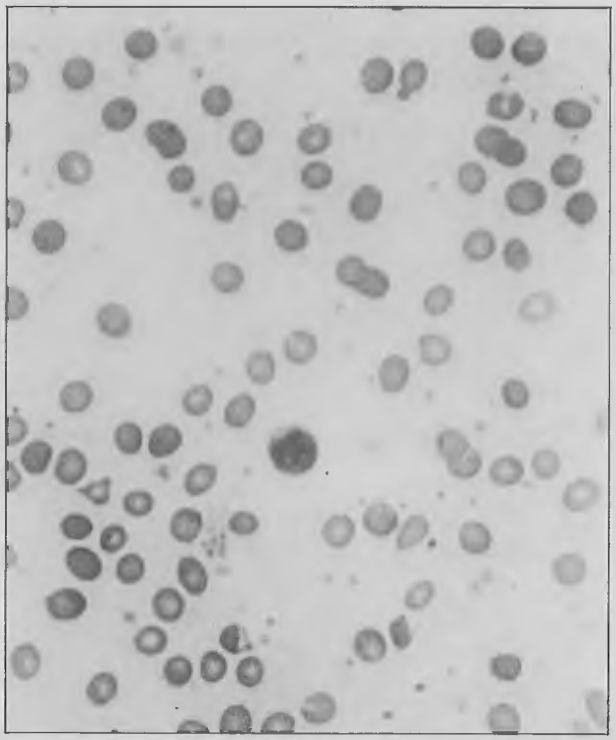

Fig. 1 *Peripheral blood at presentation. Note increased platelets and macrocytosis.*

Family History

Family investigations showed that the mother, aged 31 suffered from chronic anaemia from a very early age. A bone marrow performed at Christchurch Public Hospital on 2nd April 1959 reported as follows: "The most striking feature is the almost complete absence of erythroid cells. The findings are those described in cases of congenital pure red cell anaemia (erythrogenesis imperfecta)".

She was treated with cortisone and then prednisone; and at present has a completely normal blood picture and is not on any treatment, indicating remission from the disease. Tests done at Dunedin Hospital showed her to have a normal female karyotype and a slightly increased Haemoglobin F (2%). (Normal less than 1%.)

Methods

All blood screens were performed on the Technicon H6010 calibrated against Technicon Set Point Calibrator. Haemoglobin F was estimated using the alkali denaturation method of Betke et al at 540 nm[10] (Dunedin normal range <1%). Karyotypes were done on peripheral blood specimens by the Dunedin Cytogenetics Laboratory by standard methods using phytohaemagglutinin stimulation. Reticulocytes were counted using new methylene blue supravital staining and counted using a Millar occular lens.

Case Study

The patient, a male child, born 14th August 1985 presented on 2nd October 1985 showing a severe macrocytic anaemia:

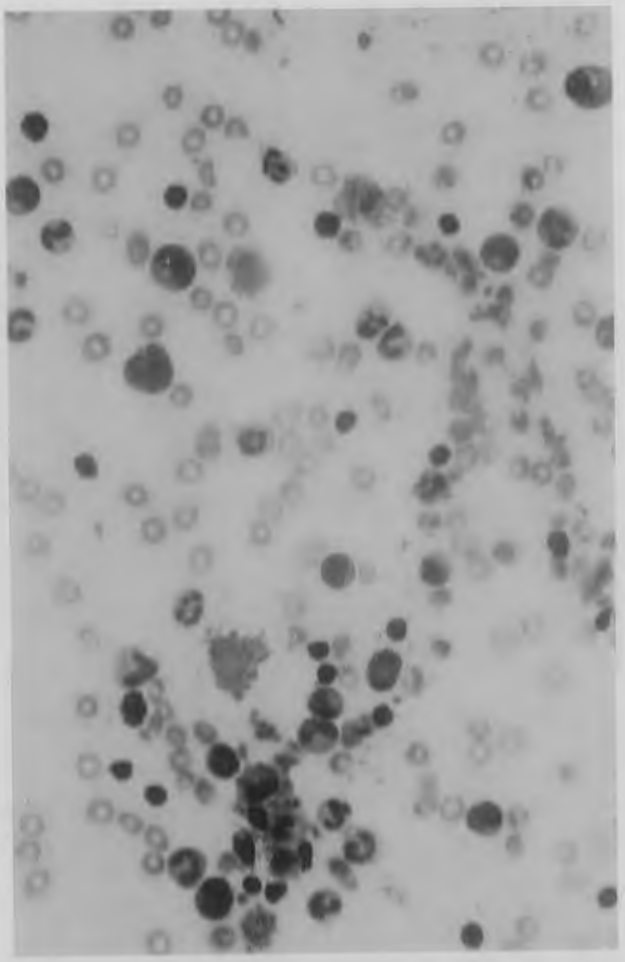

Fig. 2 *Bone marrow aspirate at presentation. Note complete absence of erythroid precursors. ME ratio > 50:1.*

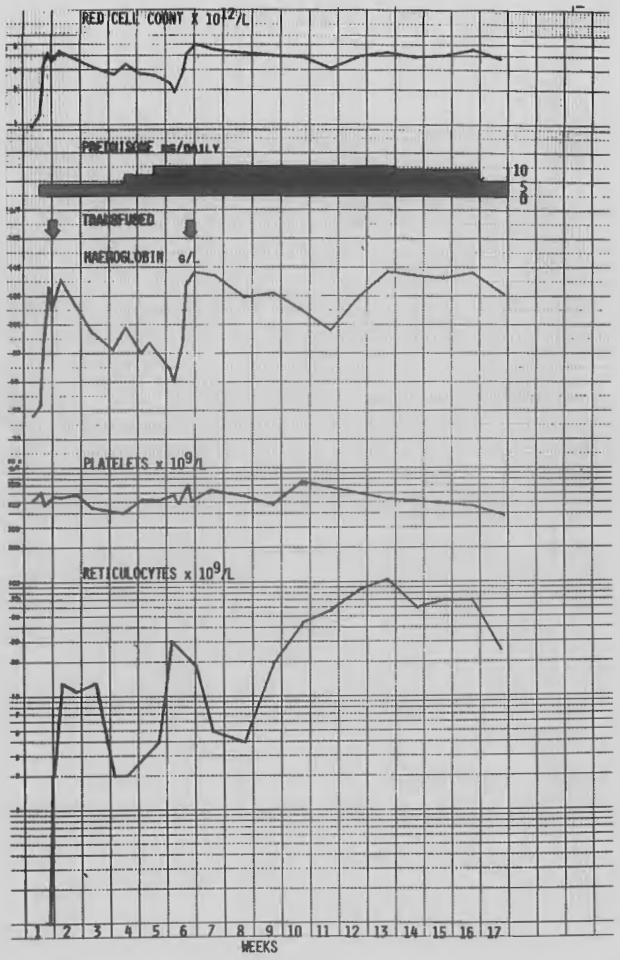

Fig. 3 *Chart of patient's results showing response to treatment with prednisone and transfusions.*

Haemoglobin 37 g/L, Haematocrit 0.11, Mean Cell Volume 104 fL, Platelets 504 x 10^9 /L, Red Cell Count 0.94 x 10^{12} /L, Total Leucocyte Count 6.0 x 10^9 /L (Fig. 1).

A bone marrow aspirate performed on the 3rd October 1985 reported as follows: "Erythropoiesis very markedly reduced, only a few erythroid precursors are seen. M:E ratio >50:1 (normal 6:1) (Fig. 2.).

Conclusion — appearances are consistent with pure red cell aplasia which at this age is almost certainly congenital in origin (Diamond-Blackfan syndrome)."

Haemoglobin F was 14% at four months of age. The i antigen was not tested for because it is present in normal blood up to one year of age.

The chromosomes showed a normal male karyotype and there are no physical abnormalities present.

Treatment and Reponse

The patient was transfused on the day after admission (3rd October 1985) with 4 x ¼ units of packed cells over three days. At the same time prednisone was started at a dosage of 3.5 mg per day. The dose of prednisone was increased to 7 mg per day on the 25th October and increased to 10 mg per day on the 3rd November. A second transfusion of packed cells was given on the 10th and 11th November of 50 and 60 mL respectively.

Because an adequate response was obtained due to treatment with prednisone the dosage was increased to 8.75 mg per day on 31st December 1985 and then down to 5 mg per day on the 20th January 1986. Currently the patient is maintaing a reticulocyte response and a steady haemoglobin level. (Fig. 3)

Differential Diagnosis

The following causes for neonatal or early anaemia must be excluded. Infants with Diamond-Blackfan syndrome show few symptoms except pallor which may develop later.

1. Blood loss
   This can be acute or chronic, intrauterine or post-delivery. These will show a significant increase in reticulocytes and even nucleated red cells.
2. Infection
   This may result in anaemia of varying types and degree. More commonly infection will cause a haemolytic anaemia, which will show increased reticulocytes. Infection may affect white cells and platelets as well as red cells due to transient marrow suppression.
3. Isoimmunisation
   Maternal antibodies that cross the placenta may cause severe haemolytic anaemia. A hypoplastic state may occur between one and three months of age in the recovery stage of neonatal haemolytic anaemia. Differentiation from Diamond-Blackfan syndrome may be difficult if the history is not clear, however the haemoglobin rarely falls below 50-60 g/L and usually before this low state is reached, reticulocytosis occurs.
4. Drugs
   Drugs taken by the mother or given to the infant should always be excluded by careful inquiry.
5. Leukaemia
   Leukaemia may be suggested by the presence of an unexplained anaemia and numerous primitive cells in the marrow.
6. Bone marrow aplasia
   Both acquired and congenital aplastic anaemia rarely affect infants. In Fanconi's anaemia there are characteristic associated abnormalities, which are usually detected before severe anaemia becomes a problem.
7. Thymoma
   Thymoma is associated with pure red cell aplasia in adults.

8. Transient erythroblastopaenia of childhood (TEC)
   In children of a few months to a few years, this causes a progressive anaemia with reticulopaenia and a marrow deficient of erythroid precursors. These patients do not show signs of anaemia earlier and may have had a normal haemoglobin. In TEC red cells are normocytic (MCV < 90 fL) rather than macrocytic (MCV > 95 fL). Haemoglobin F is normal rather than elevated. TEC is a self-limiting disorder, in which the outlook is good, recovery complete and with no recurrences likely.

Conclusion

Diamond-Blackfan syndrome is a rare condition with only 200 cases having been reported up to 1976[11]. In past generations before blood transfusions were regularly performed, infants suffering from the disease were less likely to survive. Now with corticosteroid therapy many infants are able to survive to adulthood. Through this therapy in recent years more information has been found and published on the anaemia. There is no specific test for a Diamond-Blackfan syndrome and diagnosis has to be made by exclusion and long-term follow up. When specific tests become available a carrier status may be identified. The mode of inheritance is still not clear with some family studies suggesting an autosomal dominant inheritance but with the majority of families having one affected child, more in keeping with recessive inheritance. Our patient's mother has had the anaemia, although is at present symptomless. The other child in the family is unaffected.

Out of 133 reported cases of Diamond, Wang and Alter[3] only two cases were found in which both mother and child were affected.

Acknowledgements

The authors wish to thank; Professor J.E. Mortimer of the Paediatric Department, Dunedin Hospital, for permission to use the patient's notes and Mr John Lucas, Haematology Department, Dunedin Hospital, for all his help.

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An Improved Small Pool Freeze-Dried Cyroprecipitate. Factor VIII Concentrate.

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Abstract

A combination of several minor modifications of an existing cryoprecipitation technique have resulted in significant improvements in the specific activity and potency of a routinely prepared cryoprecipitate Factor VIII concentrate. Cryoprecipitate is prepared from frozen plasma by rapid thawing in a circulating 4°C waterbath. Individual cryoprecipitates are each reconstituted with 10 mL of Tris-citrate-saline buffer and then pooled, rapidly frozen and freeze-dried.

The final product has a specific activity of 0.20-0.30 IU Factor VIII /mg protein, a potency of 5-8 IU Factor VIII per mL and a recovery of 300-414 IU Factor VIII per kg plasma. The freeze-dried product was more readily reconstituted and contained smaller amounts of visible particulate material when compared with previous cryoprecipitate. *In vivo* recovery of Factor VIII activity and patient tolerance of the product were excellent.

Key Words

Factor VIII, cryoprecipitate, freeze-dried.

Introduction

Cryoprecipitate remains a very important source of Factor VIII for the clinical management of Haemophilia A. The preparation of cryoprecipitate in the closed bag system[1] is a simple procedure easily within the capabilities of most blood processing laboratories. Cryoprecipitate has the advantages of smaller pool size and higher yield than higher purity commercial Factor VIII concentrates. However, the disadvantages of cryoprecipitate include poor product solubility, large variations in Factor VIII levels in individual cryoprecipitates, often significant adverse patient side reactions to the product and a general lack of convenience in regular use.

For the past 16 years the Auckland Blood Transfusion Centre has prepared cryoprecipitate concentrate as a freeze-dried three donor pool product. This small pool dried product was significantly easier to transport, store, reconstitute and infuse than frozen individual cryoprecipitates. However in the past freeze-drying of the cryoprecipitate has often resulted in a product with a high pH after reconstitution and variable potency and yield of Factor VIII. The dried product has also contained significant amounts of insoluble fibrin-like material which has been implicated in causing unpleasant side effects such as nausea, headache and tightness of the chest.

We have recently reported significant improvement in the recovery of Factor VIII from plasma through closer attention to the plasma processing and cryoprecipitation techniques[2]. We now report on 3 years experience with production of a modified three

donor pool freeze-dried cryoprecipitate Factor VIII concentrate with improved potency and quality.

Methods and Materials

Blood Collection and Cryoprecipitate recovery:

Blood (450 mL) was collected from random healthy donors into 63 mL CPD anticoagulant in the primary bag of a triple blood pack (Tuta Laboratories, Australia). The blood was centrifuged at 15°C and 3500 x g for 7 min and the supernatant plasma immediately siphoned into a satellite bag. Plasma was immediately frozen in a solid CO_2-ethanol bath[2]. Frozen plasma was stored at -30°C until required for use. Cryoprecipitate was recovered from the frozen plasma by rapid thawing in a circulating water-bath[2]. Thawing was continued with occasional manual mixing of the bags until all the ice-slush in each bag had disappeared (1.5-2.5 hours). Thawed plasma was immediately centrigued at 4°C and 3500 x g for 5 min and all the supernatant plasma carefully siphoned off into a satellite bag. Pooling of the cryoprecipitates was commenced as soon as possible after removal of the cryosupernatant plasma.

Reconstitution and Pooling of Cryoprecipitates:

The external ports of the cryoprecipitate bags were sterilized by immersion in a 70% ethanol-water bath. The bags were dried of excess ethanol and 10 mL of Tris-citrate-saline (40 mM Tris-HCl-10 mM sodium citrate-50 mM sodium chloride pH 6.5) was aseptically injected into each bag, using a disposable dispenser (Pharm-Aide, American Pharaseal Lab., U.S.A.). Three bags were connected to a 120 mL MRC plasma bottle using a transfer set (Codan BC 333, Codan Portugal, Portugal) and the cryoprecipitate in the bags solubilised by briefly immersing the lower 60 mm of each bag in a 30°C water bath. The cryoprecipitates were pooled by gravity transfer. Pooled cryoprecipitate was immediately plug frozen at -30°C.

The product was freeze-dried in a Virtis Model 250 SRC freeze-drier at an initial shelf temperature of 30°C and a maximum product temperature of 15°C. The bottles were closed under vacuum in the freeze-drier.

The freeze-dried product was reconstituted with 40 mL of water for injection.

Analytical Procedures

Factor VIII:C was assayed using a one-stage manual assay with an artificial substrate[3]. Factor VIII:RAG and Fibronectin were estimated using standard rocket immunoelectrophoretic methods[4]. Fibrinogen was assayed using a spectrophotometric modification of a standard method[5]. Total protein was estimated using a modified Biuret method[6].

Results

A typical analysis of the Tris-citrate-saline cryoprecipitate is shown in Table 1. A comparison with previous routine freeze-dried cryoprecipitate indicates a significant improvement in the specific activity and overall yield of Factor VIII. Moreover the Tris-citrate-saline cryoprecipitate showed improved reconstitution and was noticeably less viscous during infusion. The pH after reconstitution was always in the range pH 7.2 - 7.5, whereas bottles of previous cryoprecipitate have often had pH values above pH 8.0. Reconstitution in 20 mL instead of 40 mL is possible but is not current practice. Random assay of recent routine batches of Tris-citrate-saline cryoprecipitate has confirmed a Factor VIII content of 5.0 - 7.5 IU per mL and a specific activity of 0.11 - 0.30 IU Factor VIII per mg protein.

Freeze-drying of the Tris-citrate-cryoprecipitate did not reduce Factor VIII potency or specific activity but did result in increased turbidity of the product and the formation of a small amount of insoluble fibrin-like material. This material could be completely removed by pre-infusion filtration through a standard 40 μM transfusion filter (Alpha Therapeutics. U.S.A.).

Storage of the freeze-dried product at 4°C for 12 months resulted in less than 10% loss of Factor VIII potency. The product was stable at room temperature (16-22°C) for 1 — 2 months but extended storage at this temperature results in a 30-40% reduction in Factor VIII potency.

The Tris-citrate-saline cryoprecipitate was evaluated in 10 Haemophilia A patients. The *in vivo* recovery of *in vitro* activity was 83% (range 40-169%) and a mean rise of 2% per IU Factor VIII infused per kg was achieved. The half-life of the infused Factor VIII was 12 hours. Over 3,000,000 IU of the Tris-citrate-saline cryoprecipitate have been infused over the past 3 years with some minor side reactions, such as headache and nausea reported in some patients. We are presently producing about 1,200,000 IU Factor VIII as Tris-citrate-saline cryoprecipitate per year and the product is being successfully used in both Hospital Clinic and home therapy.

Table 1.

	Previous cryoprecipitate.	Tris-citrate-saline cryo-precipitate.
Factor VIII:C (IU/mL)	6.1	7.3
Factor VIII:RAG (IU/mL)	16.3	18.8
Fibrinogen (mg/mL)	15.1	10.9
Fibronectin (ug/mL)	-	4960
Total protein (mg/mL)	65.5	25.1
Factor VIII specific activity (IU/mg protein)	0.09	0.29
Reconstitution time (min)	15	8
pH after reconstitution	7.8	7.2
Citrate concentration (mM/L)	5.0	15.0
Factor VIII recovery (IU/kg plasma)	346	414
Number of batches tested	30	48

Analysis of previous cryoprecipitate and Tris-citrate-saline cryoprecipitate.

Studies on the addition of an amino-acid stabilizer to allow heat treatment of the cryoprecipitate are underway. Preliminary results indicate that heating at 60°C for 72h to inactivate the AIDS retrovirus results in considerable aggregation of cryoprecipitate protein and a consequent poor quality cryoprecipitate product.

Discussion

The use of a Tris-citrate-saline buffer for reconstitution of cryoprecipitate prior to pooling and freeze-drying has resulted in a considerable improvement in the quality of a routinely prepared freeze-dried cryoprecipitate Factor VIII concentrate. A significant improvement in the specific activity of Factor VIII and a reduction in the total fibrinogen content of the concentrate was achieved simply by removing all of the cryosupernatant plasma from the cryoprecipitate. Reconstitution of the cryoprecipitate with a buffer instead of saline or plasma results in improved reconstitution and stability of the freeze-dried product. In use the new product is less viscous and more easily and rapidly infused than previously prepared cryoprecipitate. Futhermore, the number and severity of patient side reactions to cryoprecipitate infusion has decreased significantly since the introduction of the Tris-citrate-saline cryoprecipitate. The new product is in extensive use on home therapy programs with reported savings in administration time and improvements in convenience and ease of use. No problems with product pyrogenicity or sterility have been encountered.

A number of new procedures for preparation of high yield, higher purity cryoprecipitate concentrates have been reported[7,8], but these methods have not, as yet, gained widespread acceptance. In our experience the thaw siphon method[7] although resulting in significant improvements in Factor VIII yields, was time consuming and labour intensive and not easily adapted for processing of large numbers of frozen plasma donations. Heparin aided precipitation procedures similarly gave high Factor VIII yields but resulted in freeze-dried cyroprecipitate with poor solubility. Moreover cryosupernatant plasma containing heparin is not an ideal source for subsequent Factor IX, Antithrombin III or Cohn fraction preparation.

In the light of recent reports questioning the safety of large pool Factor VIII concentrates, even after heat treatment[9] it is probable that the use of cryoprecipitate will continue. Thus methods aimed at improving cryoprecipitate potency and quality will remain of great importance. It is however necessary to develop relatively simple cryoprecipitation methods that may be readily adopted by modestly equipped routine laboratories. Tris-citrate-saline

cryoprecipitate is an easily administered small pool product in a stable form suitable for the treatment of a majority of Factor VIII deficient Haemophiliacs.

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The Use of Monoclonal Antibodies in the Immunophenotyping of Lymphoid Neoplasms

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Abstract

Two techniques are described using a panel of monoclonal antibodies to phenotype the lymphocytes in lymph glands. The information obtained from both the cryostat sectioned material and the dispersed cell suspensions provided useful clinical information. Of the two techniques described the cryostat sections may provide the more valuable information if the tissue sample is insufficient to perform both techniques.

Introduction

For many years attempts have been made to identify or label cell types. One of the main reasons for this was the desire to ascertain whether the cells were normal or abnormal (malignant). The original thrust was in the direction of obtaining knowledge of the cytochemical constitution of the haemic cells. This lead to the introduction of such stains as Perl's stain for iron in 1867, myeloperoxidase in the early 1900's and the azo-dye reactions used to detect the various enzymes in the 1940's. These cytochemical tests aided in the identification of cell types and led to the inclusion of cytochemical as well as morphological guidelines in the F.A.B. classification of Leukaemia. The advent of Monoclonal Antibodies (MoAbs) in 1975 provided the next great impetus in cellular recognition with their ability to target specific cellular antigens[1].

Many of the earliest MoAbs were produced against lymphocytes and their subsets so it is not unnatural that much work has been done in understanding the normal lymphoid organ and its abnormalities. One of the main uses of MoAbs in this area has been in the classification of lymphomas allowing further characterisation on immunological grounds[2]. These classifications tend to suggest a prognosis for the disease and are important to the physician treating the patient.

MoAbs reactions with the cellular antigens are not visible so a mean of visualization of the reaction is required. There are a number of methods, varying from direct labelling of the MoAbs to complex indirect techniques using labelled second and third antibodies. The labels on these antibodies may be Fluorescein isothiocyanate (FITC), Tetramethyl rhodamine isothiocyanate (RITC), Peroxidase, Alkaline Phosphatase or a combination of them. Each method has its own advantages and disadvantages and these must be weighed up before a technique is decided on (Table 1). For example FITC labelled cells are ideal for counting in suspension thus allowing for large numbers to be evaluated (e.g., in a fluorescence activated cell sorter) while immunocytochemical labelling allows morphological recognition of the cell simultaneously.

Two techniques are currently used in this laboratory for phenotyping lymphomas. These are 1) quantitative estimation of lymphocyte subsets using dispersed cell suspensions labelled with FITC and 2) qualitative estimation on cryostat sections using the peroxidase reaction, providing not only approximate numbers of the lymphocyte types but also their localisation within the node.

Materials and Methods

Samples

It must be realised that most MoAbs detect antigens that do not survive routine fixation and paraffin embedding. Techniques are being developed to detect some lymphocyte antigens on paraffin embedded material but to date no effective means of detecting antigens related to the T lymphocyte subsets has been described[3].

Therefore if MoAbs are to be utilised to their best the tissue must be received fresh and completely unfixed. The tissue may be kept unfrozen without any loss of antigenic activity for up to 24 hours as long as it does not become dry. It is preferable to transport tissue in a transport medium (Histocon, - Polysciences Inc. Warrington, PA USA) if there is likely to be any delay in processing. This allows tissue to be transported for up to 48 hrs at 4°C without loss of antigenicity.

Table 1

Methods for Detecting Monoclonal Antibody/Antigen Reaction

	ADVANTAGES	DISADVANTAGES
Direct Method MoAb conjugated to label.	Quick and easy to perform.	Separate conjugated MoAb for each antigen. Some loss of affinity due to conjugation.
Indirect Methods MoAb unconjugated. Subsequent link anti-bodies conjugated	More sensitive. Versatile; allowing many MoAbs to be used with same link anti-bodies. Reaction may be amplified by repeating link antibody steps.	Time consuming.

Table 2

	Immunocytochemical Technique			*Immunofluorescent Technique*		
	Antibody	Specificty	Dilution	Antibody	Specificity	Dilution
	Pan-B*	Majority of B Lymphocytes[7]	1/20	OKT 4+	Helper/Inducer T-Lymphocytes[9] Some Macrophage/Histiocytes	1/5
	T2*	Majority of T Lymphocytes[11]	1/20	OKT 8+	Suppressor/Cytotoxic T-Lymphocytes[8]	1/5
	T8*	Suppressor/Cytotoxic T-Lymphocytes[8]	1/20	OKT 11+	Majority of T-Lymphocytes[10]	1/5
	D.R.C.*	Dendritic Reticulum Cells of Lymphoid Follicles[12]	1/20	Kappa×	Kappa Light Chains	1/20
	Kappa•	Kappa Light Chains	1/40	Lambda×	Lambda Light Chains	1/20
	Lambda•	Lambda Light Chains	1/40	S.Ig⁻	Surface Immunoglobulin Bearing Lymphocytes (B Lymphocytes)	1/20
(a)	Rabbit-Anti-Mouse Peroxidase Conjugate	Secondary Antibody	1/20			
(a)	Swine Anti-Rabbit Peroxidase Conjugate	Tertiary Antibody	1/20			

* Dakopatts (Medic DDS)

• A.M.D. (Aust. Monoclonal Developments)

(a) Because of cross reactivity add 50 μL human serum to 1 mL diluted antiserum

+ Orthomune (Ortho Diagnostics Ltd) FITC Conjugated

× Kallestad Cat. No. 142, 143 (Smith-Biolab) FITC Conjugated

⁻ Kallestad Cat. No. 141 (Smith-Biolab) FITC Conjugated

If the tissue is large enough it should be divided into two. One piece is snap-frozen in liquid nitrogen, mounted in O.C.T. (Tissue-Tek II O.C.T. Compound — Lab-Tek Products, Miles Laboratories Inc.) mounting medium and thus prepared for cryostat sectioning. Sections of 5-8μm are cut and picked up on gelatin/formalin treated slides. These are allowed to dry under a fan for at least 2 hours. If sections are not being processed immediately they may be wrapped in tin-foil and frozen at -20°C indefinitely.

The other piece of tissue is pressed through a fine metal sieve to disperse the cells. The resulting suspension is centrifuged over a Ficoll/Hypaque gradient (Sepalymph — Teva Pharmaceutical Industries, Jerusalem) to separate debris and red cells from the mononuclear cells[4]. The interface cells are collected and washed twice in RPMI 1640 tissue culture medium containing 20% Fetal Calf Serum (F.C.S.) and finally resuspended at a concentration of 10^6/mL in RPMI/FCS. Cells may be kept overnight at 4°C in this medium before testing.

Material from fine-needle aspirates of suspect lymph nodes may be treated as a dispersed cell suspension if the cell density is high enough. If not, cytocentrifuge preparations are prepared and processed by immunocytochemical techniques.

Immunocytochemical Technique for Cryostat Sections and Cytospin Films

The technique is as described in Method I. Antibodies used in the study, dilution and specificity thereof are shown in Table II.

Tissue sections which have been frozen must be allowed to return to room temperature prior to unwrapping. After fixation allow slides to dry and do not rehydrate before the addition of the MoAbs[5]. The resulting reaction has been shown to be stronger than if the tissue is rehydrated before addition of the MoAbs. At this stage it is necessary to block the endogenous peroxidase. There are a number of methods available and the method of choice is 0.1% phenylhydrazine as it does not damage the tissue and when used as described leads to very clean backgrounds[6]. A three-stage indirect technique is usually used to increase the sensitivity of the technique. However this is reduced to a two-stage technique when testing for kappa and lambda light chains. 3-amino-9-ethyl-carbazole has been chosen as the substrate for the peroxidase reaction as it provides an excellent contrast with the counterstain of haematoxylin with red reaction material against a blue background. It is however soluble in routine mountants and therefore a water-based mountant is used. (Glycergel — Dakopatts - Medic DDS - or Apathies.)

Immunofluorescent Technique for Monoclonal Antibodies

The fluorescent technique is well documented and the technique (Method II) used in this laboratory is satisfactory. Cells are counted using a fluorescent microscope preferably using incident light excitation for fluorescence and transmitted white light to enumerate the total number of cells per field. After the wet preparation has been made it is important that the cells be counted as soon as possible. If there is any delay in counting, the prepared slides must be stored in the refrigerator (4°C). The slides must be read on the same day as they are prepared as the viability of the cells is seriously affected by prolonged storage at this stage.

Method 1

Immunocytochemical Straining Technique

1. Fix slides in acetone 10 min/RT. Remove from acetone and allow to dry.
2. Apply 50 μL primary antibody diluted in TRIS buffered saline (T.B.S.)
3. Incubate 45 min/RT in humid atmosphere. *Sections must not be allowed to dry out from now on.
4. Wash in Coplin jar with T.B.S. 1-2 minutes.
5. Place in 0.1% phenylhydrazine in phosphate buffered saline and incubate 30 min/37°C.
6. Wash in Coplin jar with T.B.S. 5 min/RT with occasional agitation.
7. Dry around section and apply ± 50 μL second antibody (rabbit anti-mouse; peroxidase conjugated).
8. Incubate 30 min/RT.
9. Wash in Coplin jar with T.B.S. 1-2 min/RT.
10. Dry around section and apply ± 50 μL third antibody (swine anti-rabbit; peroxidase conjugated). [NOTE DO NOT APPLY TO KAPPA AND LAMBDA. Allow these slides to remain in T.B.S. until substrate is added.]
11. Incubate 30 min/RT.
12. Wash in Coplin jar with T.B.S. 1-2 min.
13. Make up substrate as follows:- Dissolve knifepoint of AEC (3-amino-9- ethylcarbazole) in 0.75 mL dimethylformamide and add to 15 mL pH 5.2 0.1 M acetate buffer. Add 10 μL 30% H_2O_2 and use within 5 minutes.
14. Remove slides from Coplin jar, dry around section and flood with substrate. Incubate 10 min/RT.
15. Wash in distilled water.
16. Counterstain 2 minutes with haematoxylin; wash and blue with Scott's tap water.
17. Mount with Glycergel (aqueous mountant).

Discussion

Two techniques are presented for determining lymphocyte types within a lymph node. Both techniques provide useful diagnostic information which are complementary to each other. It

Table 3

	Immunoperoxidase Results						*Immunofluorescence Results*						
Case	T2	T8	B	DRC	K	L	T11	T4	T8	B	K	L	Diagnosis
I.E.T.	++	++	+++	++ ABN	+++	+	17%	N.D.	N.D.	80%	73%	3%	Non-Hodgkins Lymphoma (Diffuse)
I.M.M.	+	+	+++	+	+++	+	21%	N.D.	N.D.	82%	79%	2%	Non-Hodgkins Lymphoma (Diffuse)
S.E.M.	++	+	+++	++ ABN	+	+++	36%	25%	6%	65%	2%	58%	Non-Hodgkins Lymphoma (Nodular)
B.A.W.	+++	+	+	+	+	+	32%	N.D.	N.D.	36%	15%	4%	Hodgkins Disease
A.L.W.	+++	++	++	++ N	+	+	79%	44%	36%	6%	2%	2%	Reactive
C.J.S.	++	+	+++	++ N	++	++	81%	62%	11%	19%	12%	3%	Reactive
R.H.	+++	+	++	++ N	+	+	82%	74%	13%	22%	13%	9%	Hodgkins Disease
I.M.W.	+	+	+++	Very Scanty	+	+++	11%	N.D.	N.D.	81%	5%	88%	Non-Hodgkins Lymphoma (Diffuse)
I.M.W. (FNA)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	2%	N.D.	2%	91%	1%	88%	

+ = < 20% cells positive ++ = 20-50% cells positive +++ = > 50% cells positive N.D. = Not done

is therefore preferable for both techniques to be applied to the tissue if this is possible. If however there is a limited amount of tissue available it is suggested that the cryostat sections may provide more information. One example of this was seen in the case of a penetrating nasopharyngeal mass. A small piece of tissue (± 2 sq mm) was received and processed for cryostat sectioning. Conventional histological sections suggested a ?carcinoma ?lymphoma but as the tissue received was somewhat necrotic no firm diagnosis could be made. The cryostat sections were stained with MoAbs and proved unequivocally that the invading cells possessed the phenotype of T-lymphocytes. A few weeks after presentation the patient developed generalised skin lesions, the cells of which had the same phenotype as the original mass.

The immunocytochemical technique described has the advantage of requiring no extra equipment (e.g. fluorescent microscope) and also that the slides become a permanent record of the results. This technique may also be employed on cytospin preparations of cell suspensions (e.g. fine needle aspirates (FNA) from lymph nodes). With FNA it is possible to estimate percentages of cells positive and because each cell may be morphologically identified at the time of counting the problem of OKT4 crossreacting with macrophages may be eliminated.

Although only a relatively small number of cases have been processed by this laboratory using both techniques (some examples of which are seen in Table 3), they have proved helpful in a number of cases and in some have indicated the diagnosis of lymphomas from fine needle aspirates which have subsequently been confirmed on biopsy of the gland. (Case I.M.W. Table 3.)

It is therefore concluded that the two methods provide complementary information and that if the material available is insufficient to perform both techniques then the immunocytochemical method should take preference.

Method II

Immunofluorescent Technique for Monoclonal Antibodies

1. Prepare a cell suspension of 10 x 10^9/litre in RPMI/FCS.
2. Place 10 μL of appropriate antisera into a 75 x 12 mm plastic test tube.
3. Add 100 μL of cell suspension, mix gently and incubate at 4°C for 30 minutes. Mix gently once or twice during this time.
4. Wash twice with P.B.S.
5. Remove final wash and resuspend cell button in approximately 5 μL of P.B.S. containing 30% glycerol.
6. Make a wet preparation and seal the edges of the coverslip with nail varnish.
7. Store slides at 4°C until needed. Cells must be counted on the same day.

Note: For S.Ig and light chain estimation it is more convenient to use 200 μL of both diluted antisera and lymphocytes at step 2 and then continue from step 3 to 7 as above.

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CONTINUING EDUCATION

Macro-Creatine Kinase in a Patient with Myocardial Infarction: A Case Report

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1. Correspondence to this author.

Running title: Macro-CK and myocardial infarction.

Abstract

We describe the case of a 74 year old woman who suffered an acute myocardial infarction and whose cardiac enzyme pattern suggested the presence of an unusual creatine kinase isoenzyme in her serum. The CK-MB/total CK ratio was 1.12 on admission, it fell to 0.41 within 24 hours then rose again to 1.18 after 5 days. Heat inactivation and immunoprecipitation experiments indicated the CK-variant was probably a CK-BB-IgG complex. Laboratories should be aware of the existence of CK-variants and cognisant of their interference with routine CK-MB methods.

Introduction

The dimeric creatine kinase (CK) isoenzymes — MM from skeletal muscle, MB principally from myocardial tissue and BB principally from brain, are well known. In addition to these three cytoplasmic forms a mitochondrial CK isoenzyme (CK-Mt), existing as a dimer of identical subunits, has been characterised[1]. Human serum from healthy adults contains CK-MM almost exclusively with CK-MB, CK-BB and CK-Mt being absent or present in very low concentrations (<2 U/L). Following myocardial infarction there is a diagnostically significant rise in the patient's serum CK-MB activity and currently this enzyme is considered the most specific and sensitive serum marker for myocardial injury[2].

The use of CK-MB as a routine test led to the discovery of "atypical CK" bands on electrophoresis[3] and abnormally high "apparent CK-MB" activities with ion-exchange[4] and immunoinhibition[5] methods. These CK-variants, the presence of which may cloud the interpretation of cardiac enzyme results, have for the most part been shown to be macromolecular forms of CK and have been termed "macro-CK". Current knowledge distinguishes two different forms of macro-CK: type 1 is usually a CK-BB-IgG complex with the isoenzyme bound stoichiometrically onto the Fab region of the immunoglobulin, type 2 is not an immunoglobulin complex but very likely an oligomeric form of CK-Mt[1]. The frequency of macro-CK in hospitalised patients is 3-6% with about two thirds being type 1 and one third type 2. With the CK-MB immunological method both types of macro-CK result in false positive CK-MB values and an unusually high (>0.25) CK-MB/total CK ratio because neither type is inhibited by the anti-CK-M antibody. However, because macro-CK types 1 and 2 are much more heat stable than CK-MB and CK-BB their presence can be confirmed by heating samples at 45°C for 20 min and then measuring the residual "CK-MB" activity by the immunoinhibition method[6]. The electrophoretic mobility of both macro-CK types is variable, therefore, electrophoresis cannot be used as a discriminative test to distinguish type 1 from type 2. However, determination of the activation energy (E_a) readily differentiates between type 1 and type 2 since macro-CK type 2 has a much higher E_a (90-120 kJ mol^{-1}) than macro-CK type 1 or the dimeric CK isoenzymes (35-65 kJ mol^{-1})[6].

We describe here: (a) the findings in a patient with acute myocardial infarction who had abnormally high "CK-MB" activity in her serum and (b) our efforts at characterising this CK activity.

Case History

A 74 year old woman was admitted to hospital late in the evening following an episode of chest pain of short duration and subsequent collapse with loss of consciousness. The woman had a history of hypertension which was being treated with thiazide diuretics and was known to have suffered 2 myocardial infarctions in the previous 2 years. She was currently being treated for angina pectoris and had experienced an angina attack earlier that evening which was relieved with Anginine. Shortly following admission the patient became hypotensive wth a systolic blood pressure of 70 mmHg and an unrecordable diastolic value; ventricular tachycardia developed. The tachycardia required cardioversion and the patient stabilised. A potassium chloride infusion was given in response to a plasma potassium of 2.7 mmol/L on admission. Over the next 24 hours blood pressure stabilised to 110/70 mmHg and the patient experienced no more chest pain. A clinical diagnosis of acute myocardial infarction was made on the basis of ECG changes (ST-segment elevation and peaked T-waves) and a maximum CK value of 441 U/L (reference range 20-140 U/L) 12 hours post admission. The patient progressed favourably and was discharged from hospital after 13 days.

Materials and Methods

Routine cardiac enzyme activities were measured at 30°C on a Multistat III microcentrifugal analyser (Instrumentation Laboratory) using the following reagent kits: total CK (CK-NAC Behring Diagnostics), CK-MB (NAC-act immunological method Boehringer Mannheim), aspartate aminotransferase (AST, Gilford Diagnostics, supplemented with pyridoxal-5-phosphate), lactate dehydrogenase and hydroxybutyrate dehydrogenase (LDH, HBDH; Instrumentation Laboratory). Additional CK-MB measurements for heat stability and activation energy experiments were made at 37°C in the Multistat and at 25°C in a Shimadzu UV 200S spectrophotometer. The precision of the enzyme methods was monitored by Ortho control sera, in-house pooled sera or CK-MB control (Boehringer) as appropriate.

CK isoenzymes were electrophoretically separated on 10 g/L agarose (Litex Type HSA, medium EEO, Glostrup, Denmark) gels in Tris-barbital buffer pH 8.6, I = 0.02[7] with 10-20 μL of sample being applied and run for 30-40 min at 200 volts. During electrophoresis the apparatus was cooled with running tap water.

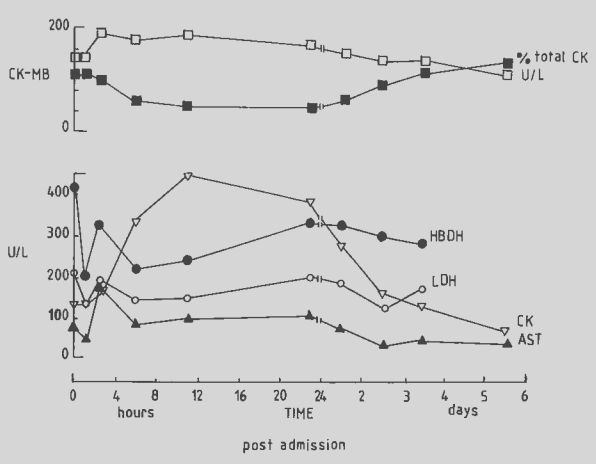

Figure 1. Serial cardiac enzymes in a patient with myocardial infarction and macro-CK.

After electrophoresis, a filter paper (Whatman No. 1) impregnated with CK reagent (reconstituted to 3 times usual concentration) was placed on the agarose gel and incubated in a humid chamber at 37°C for 60 min, then the paper was removed and discarded. A fresh, dry paper was placed on the gel to blot the NADPH produced. This paper was dried with a hair dryer and viewed under an ultraviolet lamp whence fluorescence corresponding to the enzyme bands on the gel was visible on the paper, but enhanced as compared with that seen on the wet agarose gel.

The protocol of Stein et al[6] was employed to help characterise the CK-variant. Briefly, residual CK-MB activity was measured at 25, 30 and 37°C after serum samples had been heated in a water bath at 45°C for 20 min then cooled to room temperature. Activation energies were calculated from the slope (b) of Arrhenius plots of ln (residual activity, U/L) versus 1/T. Thus $E_a = -8.31 \times 10^{-3} \times b$ kJ mol^{-1} where 8.31×10^{-3} kJ mol^{-1} deg^{-1} is the gas constant.

To ascertain the presence or absence of a CK-immunoglobulin complex 50 μL aliquots of patient's serum were incubated at room temperature with either saline (control) or 50 μL of rabbit antisera (Dakopatts, Glostrup, Denmark) to the immunoglobulins IgG, IgM, and IgA. After 4h the mixtures were centrifuged and the supernatants assayed for CK activity. A further addition of 100 μL of the appropriate antiserum was added and after incubating the mixtures overnight at room temperature, CK activity was again measured in the supernatants. Residual CK activity was expressed as a percentage of the control.

The normal reference intervals (U/L at 30°C) for cardiac enzymes in our laboratory are: CK 20-140, CK-MB 6% total CK, AST 8-35, LDH 40-115 and HBDH 95-240.

Results and Discussion

Figure 1 depicts the patient's serial enzyme results. As is typical of myocardial infarction, total CK activity peaked first, followed by AST then LDH and HBDH. Despite the absence of frank haemoglobin in the sera, haemolysis (either *in vivo* or *in vitro,* or both) is the most likely explanation for the early fluctuation in the levels of AST, LDH and HBDH. Erythrocytes are a rich source of these enzymes and elevated enzyme levels occur before haemolysis is visually apparent[8]. While CK-MB activity in the myocardium represents up to 42% of the total activity[2,8], the serum CK-MB/total CK ratio following myocardial infarction rarely exceeds 0.20-0.25 (20-25%)[6,9,10]. As shown in Figure 1 this

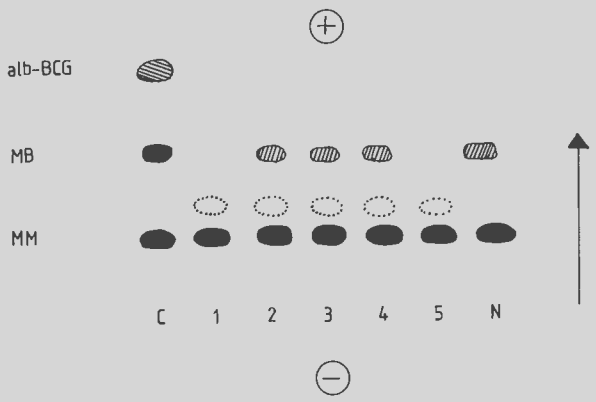

Figure 2. Agarose gel electrophoresis of CK isoenzymes.

alb-BCG, albumin-bromocresol green marker prepared by adding a drop of BCG reagent to the CK-MB control prior to electrophoresis.

C, Boehringer CK-MB control.

1-5, specimens taken at 0, 6, 11, 23 and 60 h respectively post admission (see Figure 1).

N, serum from patient with myocardial infarction and CK-MB/total CK ratio of 0.10.

Arrow shows direction of migration. Decreasing intensity of fluorescence is represented by filled spots, crossed spots and dotted spots respectively.

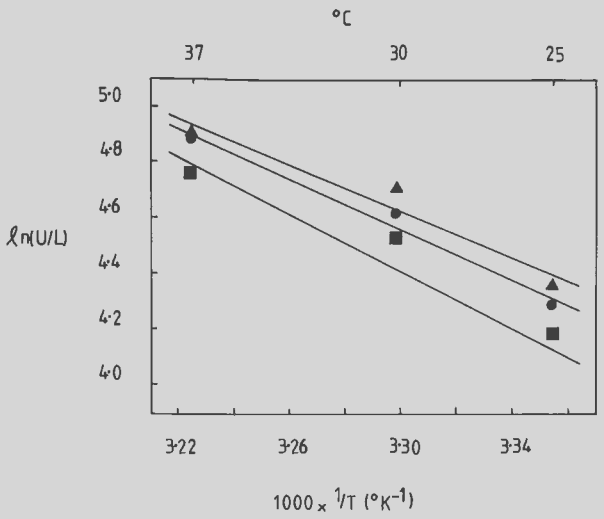

Figure 3. Arrhenius plots of heat stable "CK-MB" activity

Residual CK-MB activity was measured after heating serum at 45°C for 20 min. Slopes were calculated by linear regression from specimens taken at 1, 6, 11, 35, 60 and 84 h post admission (see Figure 1) and all were used to calculate the mean activation energy. For clarity only specimen times 1 h (●), 35 h (▲) and 60 h (■) are shown on the graph.

patient had a CK-MB/total CK ratio of 1.12 on admission which fell to a minimum of 0.41 and then rose again to 1.18. Concurrently the absolute CK-MB activity (U/L) peaked about the time of the lowest CK-MB/total CK ratio. These profiles are consistent with the release into the bloodstream of a burst of "true" CK-MB superimposed on a baseline CK activity that is partly composed of CK subunits not inhibited by anti-CK-M antibody. Paradoxical CK-MB/total CK ratios up to 2.0 will occur if sera contain high amounts of macro-CK, CK-BB or CK-Mt since CK-MB activity is calculated as residual "CK-B" subunit activity multiplied by 2.

Agarose gel electrophoresis also revealed the presence of an abnormal CK form. Figure 2 shows the patient had a band that migrated anodally to CK-MM and which persisted at roughly the same intensity throughout the interval during which a CK-MB band appeared then disappeared. At no stage was a CK-BB band seen. CK-BB if present (in either the control serum or the patient's sera) would have appeared slightly anodal to the albumin-bromcresol green (alb-BCG) marker[11]. The CK isoenzyme pattern of a patient with a CK-MB/total CK ratio of 0.10 and typical of myocardial infarction is shown for comparison. In this case only CK-MM and CK-MB were visible. Usually macro-CK type 1 migrates between CK-MM and CK-MB whereas macro-CK type 2 and CK-Mt typically migrate cathodally to CK-MM[1,3], however, exceptions occur[12,13]. Moreover, adenylate kinase which catalyses the reaction: 2ADP → ATP + AMP also migrates cathodally to CK-MM[2,8] and this enzyme may appear as a band if it is present in high concentration sufficient to swamp the adenylate kinase inhibitors in the CK reagent. Thus electrophoresis, whilst readily displaying the presence of atypical CKs, cannot be used reliably to differentiate them.

Considerable CK-MB activity (42-72%) remained in the sera after heating at 45°C for 20 min. This in itself was good evidence for the presence of macro-CK and together with the CK-MB/total CK ratio and electrophoretic results clearly established its existence. The activation energy calculated from the slopes of the Arrhenius plots (Figure 3) was 40 ± 1.8 (mean ± SEM, n=6) kJ mol^{-1}, thus defining the macro-CK as type 1.

The immunoglobulin in macro-CK type 1 is usually of the IgG type but complexes with IgA have been reported[13,14]. Our attempts to identify the immunoglobulin associated with this macro-CK were equivocal. When sera were incubated with antisera significant inhibition of CK activity occurred with anti-IgG (Table 1). This was particularly evident with the specimen taken 1 hour after admission and before the macro-CK was diluted with the post infarction release of CK-MM and CK-MB. Some

Table 1.

Results of immunoprecipitation experiments

	Percent residual CK activity			
Antiserum	I	II	III	N
after 4h incubation				
anti-IgG	88	95	92	99
anti-IgM	107	104	100	103
anti-IgA	100	99	100	93
after overnight incubation				
anti-IgG	64	87	77	100
anti-IgM	102	104	103	115
anti-IgA	79	90	90	102

I, II and III are from specimens taken 1, 11 and 60 h post admission and correspond with 1, 3 and 5 respectively in Figure 2. N is from a patient with the normal myocardial infarction enzyme pattern seen in Figure 2.

inhibition also occurred following overnight incubation with anti-IgA antiserum. In contrast, the CK activity from the patient with a normal myocardial infarction enzyme pattern showed essentially no decrease following immunoprecipitation. We thus conclude that the macro-CK is a CK-BB-IgG complex though the presence of some CK-BB-IgA cannot be ruled out. A more definitive conclusion might have been possible if the macro-CK had been separated from the other CK-isoenzymes (by gel filtration or anion-exchange chromatography)[6] prior to immunoprecipitation, but the limited volumes of sera available to us precluded these experiments.

The pathogenesis and clinical significance of the macro-CKs have yet to be elucidated. Patients with macro-CK type 1 are generally elderly women but no common pathology is apparent and whether the complex results from some autoimmune process[15] or merely from a nonspecific protein-protein interaction[14] is not clear. Macro-CK type 2 is seen in the serum of severely ill patients, often with malignant tumours[3] and the appearance of CK-Mt is considered an ominous sign[16].

In conclusion, this report illustrates the effect of macro-CK on a commonly used immunoinhibition assay for CK-MB and demonstrates the worth of performing serial CK-MB assays on patients with suspected myocardial infarction and unusually high CK-MB/total CK ratios. Solid-phase, two-site, sandwich-type immunoassays that are *specific* for CK-MB have now been developed[13].

Acknowledgements

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TECHNICAL COMMUNICATION

Positive Displacement Pipetting of Packed Erythrocytes — Evaluation of the SMI Digitron

Robert W.L. Siebers, ANZIMLT, Timothy J.B. Maling, MRCP FRACP.
Section of Clinical Pharmacology, Department of Medicine, Wellington Clinical School of Medicine

Abstract

The accuracy and precision of positive displacement pipetting of packed erythrocytes with the SMI Digitron has been assessed. A 200 μL setting of the Digitron delivered on average 192 μL of packed erythrocytes with a precision coefficient of variation of 0.74%. These findings have to be taken into consideration when analysing erythrocyte constituents utilising positive displacement pipettes.

Keywords

Positive displacement pipetting, erythrocytes, intracellular constituents.

Introduction

Two areas of current interest (in the determination of erythrocyte analyses) are the determination of cations and their transport pathway mechanisms in hypertension[1], and the determination of erythrocyte drug levels as an indication of plasma free drug concentrations[2,3]. Techniques exist for the pipetting of erythrocytes by a direct method[4] or by determination of the amount of erythocytes in a cell suspension utilising haematological parameters. We report here on the use of positive displacement pipetting of packed erythrocytes by a new microprocessor controlled pipettor for which it has been claimed that amongst other variables, viscosity has a negligible effect on pipetting accuracy and precision.

Methods

Heparinised blood was obtained from a volunteer and centrifuged for 15 min at 4000 g. After removal of plasma and buffy coat the erythrocytes were washed three times with isosmolar choline chloride, and the supernatant discarded after each wash. After the final wash the packed erythrocytes were respun for 15 min at 4000 g and the remaining supernatant and top 5 mm of erythrocytes removed by aspiration. This final step ensured minimum supernatant trapping (2.5%) in the cell column[5]. Thirty tubes containing 7.8 mL of distilled water were preweighed on a Sartorius 2002 MP1 to a tolerance of ±0.1 mg. Two hundred microlitres of the packed and washed erythrocytes were repetitively pipetted into each tube with the SMI Digitron and immediately reweighed, the difference in weight being the weight of the pipetted erythrocytes. When pipetting the erythrocytes, the pipette tip was rinsed in the water in order to remove all traces of erythrocytes adhering to the inside of the pipette tip.

Results:

Results from the above study produced a mean weight difference between the water containing and erythrocyte lysate containing tubes of 0.2107 g (n=30, S.D. = 0.0016). This produced a precision coefficient of variation of 0.74%.

The density of packed erythrocytes is reported to be in the range of 1.090 to 1.105 g/L with a mean value of 1.098 g/L[6]. Two hundred microlitres of packed erythrocytes should then weigh between 0.2180 and 0.2210 g with a mean weight of 0.2196 g. As an average mean weight difference of 0.2107 g was obtained this would indicate that when setting the Digitron to deliver 200 μL it delivers on average $\frac{0.2107}{0.2196} = 191.9$ μL of packed erythrocytes.

Discussion

The brochure[7] states that the SMI Digitron assures accuracy and precision regardless of surface tension, vapour pressure, viscosity and density. It mentions whole blood (but not packed erythrocytes) as one of the fluids capable of being handled accurately by the SMI Digitron. From our study we concur that precision is good (C.V. 0.74% at a 200 μL setting) but that accuracy is not obtained when pipetting packed erythrocytes. These results are in accordance with a previous study using the SMI Micro/Pettor[5] when a mean volume of 190.8 μL (for a 200 μL setting) with a precision coefficient of variation of 1.0% was obtained.

In practical terms these findings present no major problems because of good repeatibility, but either a correction factor or a higher volume setting is required if accurate amounts of packed erythrocytes are required when using the SMI Digitron positive displacement pipette.

Acknowledgements

We wish to thank McGaw Ethicals (NZ) Ltd for the loan of the SMI Digitron during the study, the Wellington Hospital Chemical Pathology Department for the use of the Sartorius balance, and the secretarial staff of the Department of Medicine, Wellington Clinical School for typing the manuscript. This study was supported by the National Heart Foundation (N.Z.).

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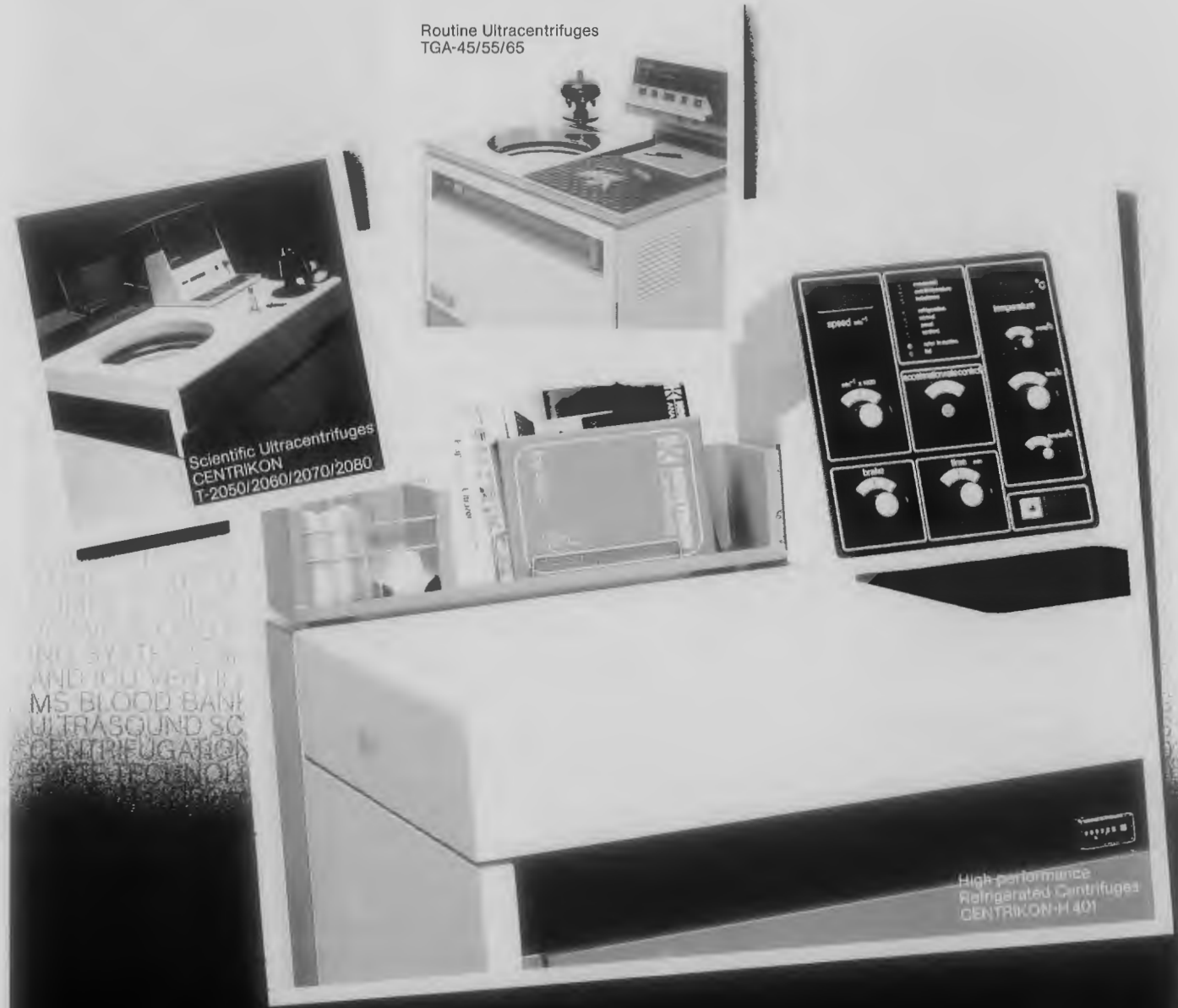

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The Pacific Way

The following article has been extracted from the Newsletter of Fiji Medical Laboratory Technologists Association. Hemant Sharma and Rajendra Parmar have given their permission for it to be published in the N.Z.I.M.L.T. Journal.

Rajendra wrote "It is quite delighting that Hemant Sharma's article and my editorial note are of interest to you". We look forward to publishing further articles from Medical Technologists in the Pacific Islands.

An Interesting Case of Eosinophilic Meningitis

By: Hemant Sharma, Haematology Unit, Dept. of Pathology, CWM Hospital, Suva.

An eight (8yr) year old girl presenting with a history of persistant headache, fever, moderate neck stiffness and difficulty in micturition was admitted in the Children's Ward of the Colonial War Memorial Hospital, Suva.

The cerebro spinal fluid (CSF) from this patient was submitted to the microbiology Laboratory with provisional diagnosis of Meningitis. Upon examination CSF showed:

RBC	— 12/cmm
WBC	— 912/cmm
Protein	— 104mgm%
Sugar	— 45mgm%
Chloride	— 74mgm%

Two smears were prepared from the sediments of the CSF. The Gram stain did not show any organisms. The second smear stained with Leishman's stain showed 60% *eosinophils* and 40% Lymphocytes. Findings of Leishman's stain were confirmed by haematology section and a diagnosis of Eosinophilic Meningitis was made. Complete blood count and film results of peripheral blood are as follows:

Hb	— 13.4g
PCV	— 41.5%
MCV	— 90Fl
WBC	— 12600/cmm

Differential count:

Neutrophils	— 55%
Lymphocytes	— 28%
Monocytes	— 2%
Eosinophilis	— 14%
Basophils	— 1%

Film Report

RBC	— Normocytic Normochromic
WBC	— Moderate Eosinophilia
Platelets	— Normal

However, the most striking feature of the investigations was the presence of multiple microfilariae on both the wet preparations and Leishman's stain. Microfilariae were provisionally confirmed as *Wuchereria bancrofti.*

Later the family members of the same patient were screened for filariasis and the brother's blood showed microfilariae. Available data incriminate *Angiostrongylus cantonensis* as the causative agent of eosinophilic meningitis and this is probably the first ever case in Fiji which indicates probable association of microfilariae in eosinophilic meningitis.

Acknowledgement

Permanent Secretary for Health and Social Welfare Fiji for permission to publish this paper.

Additional Note: Rajendra Parmar

Numbers of cases of Eosinophilic Meningitis have been diagnosed in the last two to three years among young and adult patients at CWM Hospital. Laboratory diagnosis practically improved after implementation of standard procedure of preparing two smears of centrifuged sediments of CSF and staining one each by gram and Leishman staining methods. This procedure is followed for all CSF which shows more than 10WBC/cmm and smears of Leishman stain which may have any doubts about differential cell count are presented to haematology unit for confirmation. This procedure is found to be useful and is important for differential diagnosis of Eosinophilic meningitis.

Etiology

Most documented cases in available literature incriminate *Angiostrongylus Cantonenesis* lung worm of rats as the causative agent.

The infection with this nematode parasite causes inflamation of the meninges by eosinophils and hence is called as Eosinophilic Meningitis.

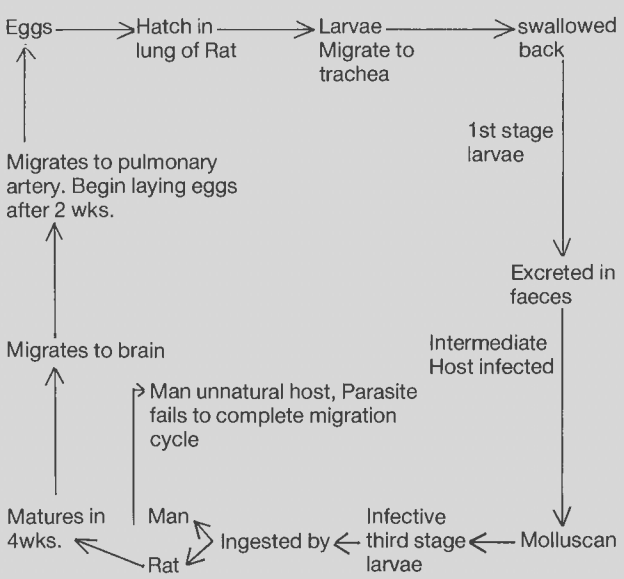
Life Cycle

The adult worm measuring about 15-20mm in length resides in the pulmonary artery of rats. Eggs are laid and develop into first stage larvae which migrates up the air passages, swallowed back and excreted faeces. These larvae are ingested by snails, slugs etc., which are intermediate host. The larvae can cause infection to rats by eating intermediate host. In the rat, larvae complete their migration through the circulation to the brain and finally develop into young adult in the lungs.

A number of other hosts like crabs, fish, planarian feeding on snail can acquire larvae of Angiostrongylus and man becomes accidently infected by eating such host either raw or partially cooked. Man is an unnatural host for Angiostrongylus cantonensis and the worm fails to complete the migration cycle. The larvae migrate to the brain and undergo some development and die. Their presence in the brain and spinal cord causes symptoms.

However, case presented here is possibly first in Fiji to indicate probable association of microfilariae in eosinophilic meningitis. Fiji being endemic for filariasis, a serious thought has to be given for a proper study to evaluate association of microfilariae in eosinophilic meningitis.

Life Cycle of Angiostrongylus Cantonensis



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Membership Fees and Enquiries

Membership fees for the year beginning April 1, 1985 are:
For Fellows — $45

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

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

CORRESPONDENCE

Refund of Telephone Rentals: Guidelines
HSPC Circular 1985/86

Chief Executives of All Hospital Boards
and Area Health Boards

Officer for enquiries: Dorothy Baker

Dear Sir/Madam

The criteria used by boards to determine staff's eligibility for the refund of telephone rentals and the application of this criteria has been the subject of criticism from various employee representative groups.

The Commission has pointed out to these groups that telephone rentals are administrative, are not therefore negotiable and accordingly are at the discretion of individual hospital boards. It would however be helpful if boards could take the opportunity to review their present telephone rental procedures. To assist boards in that review the following guidelines have been constructed. The Commission is aware that the Hospital Boards' Association covered the question of a standard policy in their circular of 1983/30. Following consultations with officers of the Hospital Boards' Association the guidelines contained in the 1983 circular have been updated in this circular.

Boards should note that where the authority to approve refunds is delegated to institutions or Heads of Department care should be taken to ensure that the staff responsible are familiar with the board's policy and are applying it in a manner which ensures consistency throughout the board's institutions and departments.

In addition when deciding upon a policy, boards should ensure that the criteria are non-discriminatory and rationally based. For example, to determine an employee's eligiblity for a full refund as opposed to a half refund on the basis of their 'bread-winner' status is discriminatory and only serves to attract criticism.

RECOMMENDED GUIDELINE: TELEPHONE RENTAL REFUND POLICY

Generally, consideration should only be given to refund or telephone rentals to full time employees unless otherwise provided for in determinations, awards or industrial agreements. Within this consideration residential telephone rentals may be refunded in the following circumstances:

1. Full refund of telephone rental to occupiers of the three principal board positions i.e. Chief Executive, Chief Nurse, Medical Superintendent in Chief.

2. Half refund of telephone rental to employees required to be regularly on call and to have a telephone at their private residence for on call purposes.

   "Regularly" is understood to be defined in line with that applying in the Pharmacists' Award i.e. a total period in excess of 10 weeks of on call duty in any one year.

   Where an employee is required to be on call for periods substantially in excess of 10 weeks in any one year boards may wish to consider a full refund of the telephone rental.

3. Half refund of telephone rental to employees who in the opinion of their board are required to be contacted by telephone in the interest of the board to a significant degree.

   This applies only to employees whom the board considers require to be contacted after hours on a regular basis and not those employees who, because of their own department's arrangements are contacted regularly. Employees eligible for a half refund under this provision may include: Chief Engineer, Works Supervisor.

   Boards may wish to consider a full refund in those circumstances where an employee is frequently (being understood to mean in excess of one or more times a week) required to be contacted. The Commission does not envisage that this would apply to many board officers other than the Principal Officers.

4. *Rosters*
   Where a roster operates in an on call situation and the number of employees on that roster is in excess of five, the total amount of telephone rental which would be reimbursed to only five employees shall be divided proportionately amongst the employees sharing the roster, provided that no employee receives in excess of half the cost of the telephone rental.

5. *Heads of Department*
   Head of Department are not seen as being automatically eligible for a refund solely by virtue of their position. However, where such an employee meets the requirements of "3." that is, is regularly contacted by the board, a refund may be considered.

6. Where a determination, award or industrial agreement

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covering the employees' conditions of employment makes provision for the payment of telephone rental this will over-ride the board's policy, and the provision will be strictly adhered to. Payments over and above the provision will not be made.

Yours faithfully
Dorothy Baker
for Chief Executive

Re: HTLV III Testing

The Secretary
Blood Transfusion Management Committee
Department of Health
P.O. Box 5013 Wellington

Dear Madam

This Institute has received a number of letters from Charge Technologists of provincial laboratories expressing concern at the decision to centralise HTLV III testing at regional centres.

Before making any comment it would be appreciated if you could advise this Institute what were the reasons behind regionalisation of the HTLV III testing of donor blood. It would also be appreciated if you could advise us if there are any plans for further regionalisation of blood transfusion services.

Yours sincerely
B.T. Edwards
Secretary NZIMLT

Dear Mr Edwards

Thank you for your letter of 22 November 1985 regarding AIDS virus antibody testing of donor blood being carried out at regional centres.

The recommendation that all AIDS virus antibody testing on donor blood should be performed only in Regional Transfusion Service Laboratories was made by the BTS Management Committee, on the advice of the Transfusion Advisory Committee as their technical sub-committee.

This matter was considered again by TAC at their meeting on 23 October 1985 when they again confirmed their previous recommendation on the grounds that until the test is up and running it should be restricted to a small number of centres.

You will no doubt be aware that in Australia, all AIDS virus antibody testing for both donor screening and diagnostic purposes is done only in a relatively small number of specifically designated medical laboratories. As similar problems could arise in both countries and there are obviously adequate reasons for both countries independently coming to the same conclusions as to how testing should be performed during the introductory phase of AIDS testing.

TAC will be considering this matter again at their February meeting when it could well transpire that the testing be decentralised in certain cases.

Yours sincerely
K W Ridings
Assistant Director
Division of Hospitals

Re: Corporate Membership AIMLS

Mr B Edwards
Secretary, NZIMLT
Christchurch Hospital
Private Bag Christchurch

Dear Sir

The AIMLS has altered its requirements for corporate membership with respect to the Fellowship of your Institute. You will no doubt be aware that in November 1983 the AIMLS resolved the Fellowship of the (UK) IMLS would no longer be acceptable as a qualification for entry to corporate membership as of that date. It has come to the Institute's attention that several individuals have been disadvantaged owing to the fact no lead in time was given to the implementation of the decision. Council, therefore, revised the effective date for the decision to 1 June 1986.

Although the original decision did not relate to Fellowship of the NZIMLT, after 1 June 1986 the Fellowship of the NZIMLT and (UK) IMLS will no longer be accepted for entry to AIMLS corporate membership, unless obtained prior to 1 January 1974.

The reason for exclusion of the Fellowship obtained after 1 January 1974, relates to a decision of the Institute to no longer accept any qualifications, whether Australian or overseas, obtained after that date and not based on a three year full-time degree level science qualification relevant to medical laboratory practice.

The AIMLS has also revised its policy on membership applications from residents outside Australia. The Institute now accepts overseas membership applications providing they meet the necessary qualification and professional requirements. Those requirements are:

The following overseas qualifications, together with 2 years approved postgraduate professional experience as a medical laboratory scientist/technologist or 4 years approved postgraduate experience at the technical officer level, or equivalent acceptable to Council, are acceptable for Associate Membership, or for Graduate Membership without the required professional postgraduate experience.

Canada: Advanced Registered Technologist (ART) — Canadian Society of Laboratory Technologists.

New Zealand: Certificate of Proficiency in Medical Technology issued by the Department of Health, New Zealand and leading to Associate membership of the NZIMLT, if obtained prior to 1 January 1974. Fellowship of the NZIMLT, if obtained prior to 1 January 1974.

South Africa: National Diploma in Medical Technology accepted by the South African Medical & Dental Council for registration as a Medical Technologist, if obtained prior to 1 January 1974.

United Kingdom: Associateship of the Institute of Medical Laboratory Technology, Higher National Certificate or Diploma in Medical Laboratory subjects, if obtained prior to 1 January 1974. Fellowship of IMLS if obtained prior to 1 January 1974.

United States of America: Registration with the American Society of Clinical Pathologists, NT (ASCP). Licensure for Clinical Laboratory Technologist as issued by the Department of Public Health, State of California.

An additional annual charge of $40.00 Australian is to be made for servicing overseas membership, in addition to the normal subscription.

Would you please draw the above new provisions to the attention of your membership. Anyone rejected for AIMLS corporate membership after November 1983, on the basis of their Fellowship from the (UK) IMLS should be advised to reapply prior to 1 June 1986. If you are also aware of any of your members being excluded from AIMLS membership on the basis of the lack of Australian residency status, they too should be advised to reapply.

Yours sincerely
Jacqueline Martin
National Secretary
Australian Institute of
Medical Laboratory Scientists.

Membership Sub-Committee Report — February 1986

Since our November Council meeting there have been the following changes:

	13.02.86	12.11.85	08.08.85
Membership:	1527	1495	1409
less resignations	5	8	24
less G.N.A.	15	7	12
less deletions (unfinancial)	–	4	2
	1507	1476	1371
plus applications	246	47	121
plus reinstatements	–	4	3
	1753	1527	1495

Membership Composition:

1. Life Member (Fellow)	13	13	13
2. Life Member (Associate)	2	2	2
3. Life Member	–	–	–
4. Fellow	42	42	42
5. Associate	730	705	700
6. Member	694	573	557
7. Complimentary Member	226	149	139
8. Non-practising Member	32	29	28
9. Honorary Member	14	14	14
	1753	1527	1495

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This award, consisting of $500 kindly donated by Lilly Industries (NZ) Ltd, is to be used **either** for the purpose of funding a research project which cannot otherwise be undertaken or to attend an overseas scientific meeting. The scholarship is open to all financial members of the NZIMLT currently working in the field of Microbiology. Applicants for the Scholarship must apply on the official application form available from the Secretary of the NZIMLT.

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Applications close on **1 July 1986** with the Secretary, NZIMLT, Haematology Dept, Christchurch Hospital, Christchurch. The successful applicant will be announced at the Annual Scientific Meeting.

REDUNDANT EQUIPMENT

If you have laboratory equipment or textbooks that are no longer being used, don't throw them away or leave them in a cupboard gathering dust. Old equipment and textbooks are wanted and can be used by the Pacific Paramedical Training Centre. The following equipment would be most useful:

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Administrative Technologist,
Department of Laboratory Services,
Wellington Public Hospital,
WELLINGTON.

Richard Michael FINCH, Christchurch; Miss Katherine Anne O'CONNOR, Auckland; Miss Karen Ruth BARK, Auckland; Ms Kay Annette McDONNELL, Auckland; Miss Camille Selina AH KIAU, Auckland; Mrs Kiere Elizabeth FOWLER, Christchurch; Miss Jena MYRING, Auckland; Mr Hugh Gerard WILSON, Auckland; Miss Helen Elizabeth SNOOK, Auckland; Mr Gary Leon LE CORNEC, Auckland; Miss Suzanne Violet FAULKNER, Auckland; Miss Susan HARTLES, Auckland; Mr Andrew James HUMPHREY, Auckland; Ms Monique LOCKWOOD, Auckland; Mrs Marion Jean BRETT, Auckland; Mr Ken Martin JOHNSTON, Auckland; Miss Michelle Josephine KIERNAN, Auckland; Mrs Elizabeth WHYTE, Tauranga; Miss Karen Niti STADE, Auckland; Miss Raewyn Lesley CLARK, Rotorua; Ms Jacqueline Mary ROSS, Auckland; Mrs Helen Mary MORIARTY, Lower Hutt; Ms Joan Kay BAKALAR, Wellington; Miss Robyn Valerie GEORGE, Wellington; Mrs Sarla NARAN, Wellington; Mrs Diana Sylvia SKIDMORE, Christchurch; Ms Sandra LORIMER, Wellington; Miss Maureen Ann CAHILL, Wellington; Miss Levonne Maree McNEIL, New Plymouth; Miss Nadene Robin HOSKINS, New Plymouth; Miss Stacey Lee BILLING, New Plymouth; Mrs Theresa Ellen MONAGHAN, Wellington; Miss Maree Ann THISTOLL, Lower Hutt; Miss Phillippa Lynn BEAZLEY, Lower Hutt; Miss Lynn GRAHAM, Auckland; Miss Christine Elizabeth ASHFORD, Auckland; Miss Brigette Jennifer MUSGRAVE, Auckland; Miss Megan Elizabeth FRYER, Auckland; Miss Joanne, PATON, Auckland; Miss Vicky Lee RICHARDSON, Christchurch; Ms Linda Margaret GRAHAM, Auckland; Miss Nicola Jane BROWN, Auckland; Miss Nicolette ROBINSON, Auckland; Mr Michael John SMITH, Auckland; Miss Elise SHAW, Auckland; Miss Judy Ann BUDGE, Dunedin; Ms Marianne Lynn HUNT, Christchurch; Mr Graham Warwick OLDER, Auckland; Ms Suzanne Leigh DOUGLAS, Auckland; Miss Erin SIMPSON, Auckland; Miss Rosemarie Edna HEUVELINK, Rotorua; Mrs Linda Louise HENNESSY, Tokoroa; Mrs Christine CAMPBELL, Timaru; Mrs Stephanie Helen ANNAN, Hamilton; Miss Teresa Anne GEN, Wellington; Miss Carolyn Julie SIMS, Hamilton; Mrs Geraldine Maria EDWARDS, Hamilton; Mrs Colleen Moira TARR, Hamilton; Mrs Jane HUMBLE, Wellington; Miss Julie Ann TUCKER, Hamilton; Miss Cheryline Letitia GOODALL, Auckland; Miss Jane Frances BEVAN, Hamilton; Miss Astrid HUYMANS, Hamilton; Miss Melissa GOUDIE, Hamilton; Miss Johanna Hazel FUNNELL, Hamilton; Miss Patricia Mary LUSH, Hamilton; Miss Janice Sharlee ALDRIDGE, Hamilton; Mr Michael Gerard GRACE, Hamilton; Mr Andrew Paul BROXHOLME, Palmerston North; Miss Michelle SUTHERLAND, Hamilton; Miss Carolyn Ann YOUNG, Hamilton; Miss Syanne HUGHES, Hamilton; Mrs Mary Josephine ELLIS, Auckland; Ms Diane MILNE, Auckland; Mrs Yvonne Susanne HALSTEAD, Australia; Miss Maureen Anne ADAIR, Whangarei; Miss Helen MORRIS, Tauranga; Miss Michelle Jasmine O'DEA, Tauranga; Mrs Karen Lee ROBERTSON, Invercargill; Mrs Felicity Jane LOE, Hamilton; Miss Rachel DUN, Hamilton; Miss Pamela Trisha BEAMSLEY, Dannevirke; Mrs Lorraine MARSHALL, Thames; Mrs Lorraine Joy BALDERSTON, Auckland; Miss Rebecca Catherine Cazelet PORTER, Auckland; Miss Vikki Julia PYE, Auckland; Miss Marie Leonora LE BAGGE, Tauranga; Mrs Irma TURNBULL, Hamilton; Mrs Margaret Helene TISCH, Christchurch; Mrs Vineta THIRD, Christchurch; Mr Kevin Barry WILLIAMS, Christchurch; Miss Joanne Lee HUTCHINS, Timaru; Miss Lesley Robyn WILTON, Auckland; Miss Julie COOK, Christchurch; Miss Angela JOBLIN, Auckland; Miss Diane Marie GARAWAY, Auckland; Miss Gina Clare THOMPSON, Christchurch; Miss Suzanne Louise LINDSAY, Christchurch; Miss Tania Lee SMITS, Christchurch; Mrs Susan Ann CARNOUTSOS, Christchurch; Mr Glen Darwin HAMMETT, Wellington; Mr Lyndsay Colvin HOMES, Wellington; Mr Heta Sandy MAKIRI, Wellington; Mrs Batscheva REYN, Wellington; Miss Annmarie CLARKIN, Hamilton; Mr Brynley Scott CROSADO, Dunedin; Mrs Susan Jean EARLEY, Auckland; Miss

NZIMLT SCHOLARSHIP

This award, consisting of $500 donated by the NZIMLT, is to be used **either** for the purpose of funding a research project which cannot otherwise be undertaken **or** to attend an overseas scientific meeting. The Scholarship is open to all financial members of the NZIMLT. Applications must be made on the official application form available from the Secretary of the NZIMLT.

Acceptance of the Scholarship will require the recipient **either** to prepare an article for publication in the NZIMLT Journal relating to that research **or** prepare a full report on the meeting attended for publication in the NZIMLT journal.

Applications close on **1 July 1986** with the Secretary, NZIMLT, Haematology Dept, Christchurch Hospital, Christchurch. The successful applicant will be announced at the Annual Scientific Meeting.

Joanne Marie TWEED, Christchurch; Miss Sharon Lee HUTTON, Christchurch; Miss Lisa Maree KIDMAN, Auckland; Miss Dianne Beverley BLACKIE, Christchurch; Miss Amanda Mary CLARKE, Dunedin; Miss Deidre Lee-Ann HORE, Dunedin; Mrs Catherine Patricia HULL, Wellington; Miss Michelle Lisa SMITH, Lower Hutt; Miss Alison Margaret STAPLES, Lower Hutt; Ms Caroline PAYNE, Whangarei; Miss Christina Anne PURDY, Auckland; Miss Sherryn Wendy HOOKER, Auckland; Miss Janine Frances KEYS, Auckland; Miss Fiona Lee McINNES, Auckland; Miss Carolyn Joy HOOPER, Auckland; Miss Tracey Margaret HENTON, Auckland; Miss Kerry Leigh MATTHEWS, Auckland.

Applications for Associateship

Miss Anne Lesley Ruth SOUTHERN, Upper Hutt; Mrs Adrienne Joy RENTON, Auckland; Miss Yvonne Dianna JOE, Auckland; Mrs Cheryl Anne MELVILLE, Auckland; Miss Pamela Elizabeth ROWE, Auckland; Mrs Sigrum CROWE, Rotorua; Mrs Sandra FITZPATRICK, Auckland; Miss Donna Louise MITCHELL, Wellington; Miss Jocelyn Ann HUNT, Hamilton; Miss Joan Elizabeth VAN KUYK, Auckland; Ms Sandra GLOGOSKI, Auckland; Mr Andrew Joseph BUCHANAN, Wellington; Mrs Lynette McMILLAN, Christchurch; Miss Anita WHITFIELD, Auckland; Mr Barry CRESSWELL, Christchurch; Mr Ian David WILKINSON, Christchurch; Mr Herbert Vincent HAINING, South Otago; Mr Joseph Robert FAUCK, Wellington; Mr Anthony Joan GRACE, Palmerston North; Miss Gillian June HOOKER, Christchurch; Mrs Susan EVANS, Wellington; Mr Jeremy Lincoln BRETT, Wellington; Ms Mary Alice CLIFFIN, Wellington; Mrs Catherine Mary WESTWOOD, Hamilton; Mrs Marinda Raewyn HAWTHORNE, Hamilton; Mr Cyril Kenneth CLAPSON, Hamilton; Mrs Barbara Jane ASHBY, Thames.

Resignations

Miss S. GREIG, Christchurch; Miss S. RICH, Oamaru; Miss V. MARSHALL, Auckland; Miss V. HARRISON, Auckland; Mr R. PATTERSON, Auckland.

Gone No Address

Miss J. HARCOMBE, Auckland; Miss N. McNEIL, Auckland; Miss M. TRESIDDER, Auckland; Mr J. SPAANS, Palmerston North; Miss L. SCOTT, Palmerston North; Miss I. PARTRIDGE, Lower Hutt; Mr M. SMITH, Whangarei; Mr M. DENNIGAN, Whangarei; Miss D. MURPHY, Christchurch; Mrs C. HEARNE, Auckland; Mrs J. ODGERS, Auckland; Miss J. MYLES, Auckland; Miss J. HUNTER, Auckland; Mr N. TAVITI, Auckland; Miss P. HURREN, Auckland.

Membership Sub-Committee Report — March 1986

	05.03.86	13.02.86	12.11.85
Membership:	1753	1527	1495
less resignations	1	5	8
less G.N.A.	–	15	7
less deletions (unfinancial)	–	–	4
less deceased	1	–	–
	1751	1507	1476
plus applications	40	246	47
plus reinstatements	1	–	4
	1792	1753	1527

LIST OF INVITED SPEAKERS

JAN HIRSCHFELD	Director, State Institute for Blood Group Serology, Linkoping, Sweden
KAISER AZIZ	Chief, Clinical Chemistry/Toxicology Centre for Devices and Radiological Health, Food & Drug Administration, USA
BRIAN BROMBERGER	Director, Centre for the Study of Law and Technology, University of New South Wales, Sydney, Australia
CARL BURTIS	Chairman, International Federation of Clinical Chemistry, Oakridge National Laboratory, Tennessee, USA
EDWARD CHANDRARATNAN	Staff Anatomical Pathologist, Flinders Medical Centre, Adelaide, Australia
ANTHONY DODDS	Staff Haematologist, St. Vincent's Hospital, Sydney, Australia
JIM GAMBLIN	International Marketing Director, Helena Laboratories Inc., Texas, USA
DEIRDRE GARDINER, RSM	Hospital Ethicist, Mater Public Hospitals, Brisbane, Australia
EARL HACKETT	Chairman, Board of Directors, Private Blood Bank of Australia, Sydney, Australia
BRUCE HALL	Renal and Hypertension Unit, Royal Prince Alfred Hospital, Sydney, Australia
JOHN HARKNESS	Director of Microbiology, St. Vincent's Hospital, Sydney, Australia
JAMES ISBISTER	Director of Haematology, Royal North Shore Hospital, Sydney, Australia
EDWARD KEOGH	Medical Director, Reproductive Medicine Institute, Charles Gairdner Hospital, Perth, Australia
JOHN McKAY	Senior Scientific Officer in Immunology, Auckland Medical School, New Zealand
ROBERT R. RITCHIE	Professor, Department of Medicine, University of Vermont Medical School, USA
ROBERT C. ROCK	Associate Professor of Laboratory Medicine, The John Hopkins University School of Medicine, Baltimore, USA
GILLIAN SHENFIELD	Director of Clinical Pharmacology, The Royal North Shore Hospital, Sydney, Australia
ANDREW SCOTT	Forensic Science Centre, Adelaide, Australia
SAID EL SHAMI	Director of Research, Diagnostic Products Corporation, Los Angeles, USA
MALCOLM SIMMONS	Immunodiagnostic Centre, Melbourne, Australia
ANN SIMPSON	New Zealand Blood Transfusion Service, Auckland, N.Z.
PHILLIP SPRATT	Cardiothoracic Unit, St. Vincent's Hospital, Sydney
RON TRENT	Clinical Immunology Research Centre, University of Sydney
LYNN R. WITHERSPOON	Department of Nuclear Medicine, Ochsner Medical Institutions, New Orleans, USA

Jan Hirschfeld speaks out! at the South Pacific Congress on Medical Laboratory Science Aug 18-22 at the Sydney Hilton International

The South Pacific Congress on Medical Laboratory Science will include: PLENARY SESSIONS SYMPOSIA POSTERS and a MAJOR EXHIBITION Subjects covered will include: • DNA Probe Technology • Bedside Pathology • Fibronectins • AIDS — current status • Specific Proteins • The impact of Technology • Iatronic Illness • Bits and Bytes • Paternity Testing • Organ Transplantation • Fine needle Biopsy • Blood Transfusion • Immunosuppression and Cancer — Is there a connection? • Hypochromic Microcytic Anaemias • Reactive Phase Proteins.

Guest speaker at the Congress will be Internationally respected Jan Hirschfeld, Director of the State Institute for Blood Group Serology, Linkoping, Sweden.

Seating is strictly limited, and nobody connected with Medical Laboratory Science should miss this important Congress.

To reserve your place, simply return this coupon. We will confirm your reservation and forward your registration form.

To: The Secretariat,
South Pacific Congress on Medical Laboratory Science, G.P.O. Box 2609, Sydney, NSW, Australia 2001
Telephone: (02) 241 1478 or (02) 27 6940
Telex: AA74845 CONSEC
Cables: CONVENTION Sydney.

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ADDRESS _____

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Please reserve a place for me at the South Pacific Congress on Medical Laboratory Science, August 18-22.
I understand that this reservation is not binding until you receive my payment.
You will confirm my reservation at a later date.

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The most advanced automated haematology comprehensive information on all cell types, down

Few things will influence the course of laboratory diagnosis more than the TECHNICON H·1 system. Now, for the first time, a bench-top random access, laser-based haematology instrument will provide accurate, comprehensive information on all cell types of clinical interest.

RBC MORPHOLOGY FLAGGING

The Technicon H·1 is the only instrument that gives RBC morphology flags for abnormals, saving laboratory time and reducing costs. In addition to traditional haemoglobin determination, Technicon H·1 is capable of quantitating haemoglobin content in each individual red cell, providing valuable assistance in diagnosis of red cell disorders.

FULL WBC DIFFERENTIAL

The Technicon H·1, the most complete WBC differential yet seen in any automated instrument. In addition to the well established cytochemical differential technique, the H·1 is capable of stripping away the cytoplasm of WBC's and then classifying the maturity of each nucleus by automated dark-field cytometry. This provides the haematologist with valuable information on the maturity of the granulocyte series.

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Technicon H·1's flexible reporting system enables laboratories to issue to the wards or doctor only that information which they require – the remaining information is held on hard copy should further interpretation be required.

system in the world, providing to single cell level.

UNMATCHED QUALITY CONTROL

The new Technicon control bloods operate on high, low and normal value levels to ensure accuracy of information on a day to day operating basis. The exceptional stability of the H·1 means that recalibration is required infrequently. The quality control data package permits the monitoring of up to 9 identified control materials each with 16 assayed tests, as well as Moving Average programs.

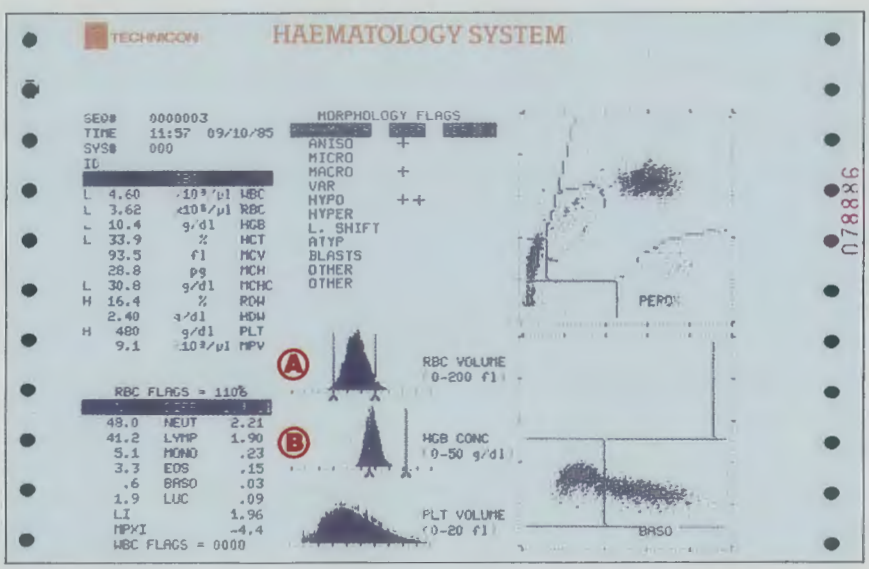
UNMATCHED ECONOMY

Only 3ml reagents are required to perform a CBC and full differential. The on board storage of sufficient reagents (6 in all) to perform 900 tests, enables the H·1 to operate for days before reagent replacement is necessary.

THE MOST COMPREHENSIVE REPORT FROM ANY AUTOMATED HAEMATOLOGY SYSTEM

A quick glance at this report form (only one of several that the TECHNICON H·1 system produces) will demonstrate to you the comprehensive clinical data available from the new TECHNICON H·1 system.

Upon review of this report, the physician is able to identify moderate anaemia (low Hgb and Hct), with a slightly increased platelet count. Additionally, the red cell volume histogram (A) suggests anisocytosis and the haemoglobin concentration histogram (B) suggests hypochromasia. The printed morphology flags on the report immediately alert the technologist to these conditions.



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Membership Composition:

1. Life Member (Fellow)	13	13	13
2. Life Member (Associate)	2	2	2
3. Life Member	–	–	–
4. Fellow	42	42	42
5. Associate	732	730	705
6. Member	721	694	573
7. Complimentary Member	235	226	149
8. Non-practising Member	32	32	29
9. Honorary Member	15	14	14
	1792	1753	1527

Applications for Membership

Mrs Diane Ruth FISKEN, Auckland; Mr Raymond John SYKES, Auckland; Mr Peter Thomas LUDWIG, Auckland; Miss Brenda Lorraine PRICE, Whangarei; Mrs June Frances McGUNNIGLE, Whangarei; Miss Lesley-Ann GOODMANSON, Whangarei; Miss Colleen Mary DYER, Whangarei; Mrs Gillian Anne WATSON, Tauranga; Miss Pamela Lindsay CONSTABLE, Dunedin; Miss Susan RUTHERFORD, Masterton; Mrs Maria Jodie PRESS, Masterton; Mrs Maura WEBBER, Masterton; Mr Ronald Colin HART, Christchurch; Miss Maree Anne PATERSON, Auckland; Miss Gaylene Joy McKENZIE, Whangarei; Ms Tracey-Anne MACKAY, Auckland; Miss Stacey Margaret COOPER, New Plymouth; Mr Ronald Mervyn FRITH, Auckland; Miss Lee-Anne Margaret SMITH, Wellington; Miss Darina Kathryn MOFFAT, New Plymouth; Miss June Louise HIGHAM, Stratford; Miss Frances Marie MULDERRY, Auckland; Mrs Andrea Francis MAHONEY, Auckland; Miss Rhonda BLOOR, New Plymouth; Miss Helen Rosemary BOYER, Auckland; Mrs Robyn Lisa COLCORD, Whangarei; Miss Tracey Leigh GUY, Tauranga; Mrs Andrea Jeanette KENDALL, Auckland; Mrs Elizabeth SMEATON, Christchurch; Miss Denise Margaret VALLANCE, Christchurch; Miss Karen Ann SHANNAHAN, Greymouth; Miss Nicola Jane MELROSE, Christchurch; Miss Helen Mary CHRISTENSEN, Christchurch; Miss Deborah Anne MACKAY, Christchurch; Miss Nicola Marie HERCOCK, Palmerston North; Miss Natalie Sharon TABB, Blenheim.

Applications for Associateship

Mr William Ronald FYFE, Dunedin; Mr Clinton Gregory CRABBE, Palmerston North; Mrs Frances Anne EDWARDS, Gisborne.

Reinstatements

Mr R.J. TRACEY, Napier.

Resignations

Mrs G.E. EVANS, Christchurch.

Deceased

Mr D. MacDONALD, Auckland.

Honorary Membership

Mr John BEATTIE, Wellington.

LETTERS TO THE EDITOR

Re: N.Z.A.C.B.

Dear Sir

I would like to bring to the notice of your members a change that has been made to the constitution of the New Zealand Association of Clinical Biochemists. Specifically the membership requirement for a science degree or equivalent has been removed. This was done to widen the membership of the N.Z.A.C.B. and to give to those working in the field of clinical biochemistry in New Zealand the opportunity of sharing in the promotion of clinical biochemistry. Requirements for membership are now; employment in the field of clinical biochemistry and a demonstrable interest in the advancement of clinical biochemistry.

This change was made possible by the transfer of negotiating rights from the N.Z.A.C.B., to the recently formed New Zealand Hospital Scientific Officers Association Incorporated (N.Z.H.S.O.A.I.). This meant that the restriction on N.Z.A.C.B. membership in order to protect negotiating rights could be removed.

Full membership will be available to all non-graduates with the proviso that a temporary restriction has been applied to membership of council until 1989 when the N.Z.H.S.O.A.I., will be fully independent of the N.Z.A.C.B. and Hospital Physicists Association. Information on membership and application forms are available from N.Z.A.C.B., council members in each of the five centres or myself.

A further item of interest to technologists is a one day course in Clinical Biochemistry to be held in the Ernest and Marion Davis Centre, Auckland Hospital. The course is to be held on Wednesday 3rd September in conjunction with the N.Z.A.C.B., Auckland Conference on September 1st — 3rd. Attendance is open to all and separate registration for the day of the course is acceptable. Registration forms are available from the Conference Secretary Dr R. Couch, Toxicology Laboratory, Auckland Hospital.

C.W. Small
President
N.Z.A.C.B.

Re: Post Doctoral Medical Research

Dear Sir

The National Medical Researcher Matching Program (NMRMP) is an information service that attempts to match professional opportunities in postdoctoral medical research, in the United States and Canada, with eligible individuals worldwide. These individuals can be M.D.'s and Ph.D.'s or foreign equivalent degree holders in medical or health related areas, who are interested in conducting research in the United States or Canada.

In order for the NMRMP to better serve the professional community in your country, we would like to request your co-operation in making an announcement about our program in the next edition of your publication. By doing so, you will provide an opportunity for eligible individuals in your community to advance their knowledge, experience and techniques in medical research.

By operating a computerized information network which maintains direct contact with over 80,000 medical research directors in the United States and Canada, the NMRMP is able to provide the eligible individuals with information regarding at least ten research opportunities each time for four times per year, according to the individual's preferred specialization.

For detailed information, prospective applicants may contact:
National Medical Researcher Matching Program
1109 Main Street, Suite C
Boise, Idaho 83702 USA
Telephone: (208) 336-7387, 336-7397
Toll Free: (800) 245-1886
Cable: NMRMP
Telex: 3717411 NMRMP
Telecopier: (208) 336-1471 NMRMP

Thank you for your co-operation. Should you require any further information, please feel free to contact us.

Sincerely yours
Jean K. Swanke
Executive Secretary

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Instant known concentration of chlorine where you want it, when you want it.

Now available in New Zealand and known as DIVERSOL 2000 PLUS, it provides an instant source of known concentration of available chlorine as and when it is required. It is this safety factor and convenience that has lead to its rapid acceptance in Australia since the product launch there.

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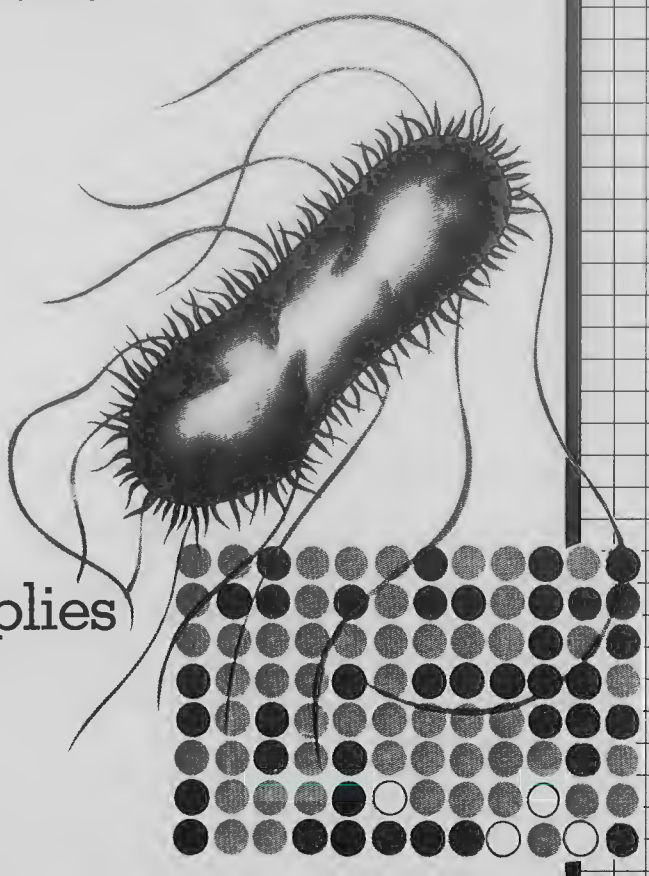

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Directions for use are printed on the sachets which are packed in cartons of 25 and 100.

Freshly poured at a concentration of one sachet to four litres of clean water, the white powder is readily miscible to produce a pink solution, the colour being an indicator that it is freshly made and uncontaminated. At that concentration the solution produces 2000 p.p.m. available chlorine.

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Diversol 2000 Plus is packed in a foil laminate sachet to give an indefinite shelf storage life.

Areas of use:

Diversol 2000 Plus is suitable for use in:

- Blood banks
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Further details are available from DIVERSOL 2000 agents: Kempthorne Medical Supplies Ltd., PO Box 1234, Auckland.

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FLOW LABORATORIES NOW DISTRIBUTED BY KEMPTHORNE

"Flow Laboratories" a name well established in areas of cell culture, plant tissue culture, diagnostic reagents and microbiology have appointed a new New Zealand distributor for their products.

Kempthorne Medical Supplies became the exclusive distributors from March 1st with product specialist Mr Bernard Collins spearheading the promotion of Flow products.

Kempthorne advise that new stocks, are now in hand of multichannel pipettors, pipette tips, multisteppers, microplates, microplate sealers and covers, micronic tubes and racks, microplate washers, microplate readers, tissue culture reagents, microplate dispensers/dilutors and cell harvesters.

TRU-TOUCH VINYL GLOVES FROM BECTON-DICKINSON

Tru-Touch non-sterile vinyl gloves are available. They are made of heavy gauge vinyl which when combined with a superior fit maximizes flexibility and tear resistance. Contour design results in excellent sensitivity and a superior fit. The high degree of stretchability allows unrestricted hand movement and the cost is reasonable.

In an age where gloves are necessary for many procedures B-D Tru-Touch provides the answer.

Samples available on request:-

Marketed by:- Scientific Products Division, Salmond Smith Biolab, Private Bag, Northcote.

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COMPANY NEWS

The Scientific Products Division of Salmond Smith Biolab Ltd is pleased to announce the additional appointment of Peter Ellingham to Sales Specialist responsible for national sales of Sigma Diagnostics, New England Biolabs and Biorad Electrophoresis and Chromatography Products. Peter is well known to customers in the Manawatu, Hawkes Bay and Taranaki areas.

MONOCLONAL ANTIBODIES FROM WHITTAKER M.A. BIOPRODUCTS

Monoclonal antibodies may be used in conjunction with standard cell culture techniques to detect specific viral or Chlamydial antigens in cell culture preparations.

The monoclonal antibodies in Whittaker reagents are purified from mouse ascites fluid to assure a consistent titre.

The antibodies are produced from clones of Hybridomas which were derived from the fusion of SP2/0 myeloma cells and splenocytes from antigen immunized Balb/C mice.

They are available in 2mL dropper vials FITC conjugated or unconjugated with high specificity and constant titre.

Monoclonal Antibodies available are:-

Cytomegalovirus	Influenza A
Herpes Simplex	Influenza B
Herpes Simplex Bivalent 1 & 11	Chlamydia
Respiratory Syncytial Virus	

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BIO-RAD INTRODUCES NEW UNASSAYED CHEMISTRY CONTROLS

This new LYPHOCHEK bi-level control product advance chemistry control technology by eliminating the separate diluent which can conserve up to 50% of the laboratory refrigerator's space. What's more, diluent-induced value fluctuations are elminated — just add water for guaranteed CO_2 values. And to let your money go even further, you can use LYPHOCHEK Chemistry Controls to the last drop due to extended reconstituted stability.

LYPHOCHEK Unassayed Chemistry Controls, Normal and Abnormal, also contain the most comprehensive list of control constituents of any other control in the laboratory market. More than 50 bi-level utility constituents are included. That means virtually all of the laboratory's control requirements can be met with this one LYPHOCHEK chemistry control product. These include, among others, routine drugs, endocrine and general chemistries.

LYPHOCHEK Chemistry Control is offered in either human or bovine-based sera. All serum used in human control material was tested and found negative for HTLV III/LAV by ELISA. LYPHOCHEK Unassayed Chemistry Control, Normal/Abnormal, is offered in 50 x 10mL packaging.

Bio-Rad ECS Division manufactures chemistry reagent kits and a complete family of controls for Chemistry, Immunoassay, Therapeutic Drug Monitoring, Urine, Haemoglobin A1C, Anemia and Spinal Fluid Testing, under the brand name LYPHOCHEK.

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NEW STREPTOKINASE/UROKINASE THERAPEUTIC LEVEL CONTROL PLASMA

Hatboro, PA. — Bio/Data Corporation has introduced Thrombolytic Control Plasma™, a therapeutic level control for incorporation into existing procedures for monitoring fibrinolytic therapy.

This new control is a human plasma treated to simulate plasma from patients receiving streptokinase or urokinase. It contains decreased levels of plasminogen, and fibrinogen, and increased levels of fibrinogen degradation products (FDP). Assay values are provided in each package.

When assayed as a patient specimen, Thrombolytic Control Plasma provides quality assurance in the range characteristic of the lytic state with most plasma based tests of fibrinolysis including:

Plasminogen (Protopath™, American Dade®; aca™, DuPont Company; M-Partigen™, Calbiochem-Behring Corp.)
Thrombin Time (Fibrindex™, Ortho Diagnositc Systems, Inc.; Thrombin Clotting Time™, Bio/Data Corporation; Thrombin Clotting Time Reagent, American Dade®)
FDP (Thrombo-Wellcotest™, Wellcome Diagnostics) Fibrinogen (Data-Fi®, American Dade®)
Reptilase Time (Reptilase®-R, Bio/Data Corporation)

The use of the Thrombolytic Control Plasma alerts the laboratorian to the possibility of spurious results due to:

— inability of the coagulation instrument to detect clot formation in patients undergoing fibrinolysis.
— incorrect reagent formulation.
— procedural errors.

Each package of Thrombolytic Control Plasma contains five 1.0mL vials. Upon reconstitution with distilled water, the plasma is stable for 18 hours when stored at 2-8C.

For further information on the Thrombolytic Control Plasma, contact:- Wiltons Scientific

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NEW HIGH SPECIFICTY ENZYMATIC BILIRUBIN ASSAY FROM BECKMAN

Beckman Instruments, Inc. introduces Dri-STAT™ Enzymatic Bilirubin, the first widely available enzymatic bilirubin test for

clinical chemistry analyzers. The assay provides exceptional specificity over a wide range of measurable concentrations.

Using an enzymatic reaction with bilirubin oxidase, this reagent measures low levels of total bilirubin without hemoglibin interference from moderate hemolysis.

Dri-STAT Enzymatic Bilirubin has a measurable range from 0.1 mg/dL to 35 mg/dL with excellent precision:

Within Day		*Day To Day*	
0.78 mg/dL	3.8% CV	1.3 mg/dL	4.8% CV
2.23 mg/dL	0.9% CV	5.7 mg/dL	0.9% CV
3.87 mg/dL	0.8% CV	10.3 mg/dL	1.4% CV
7.80 mg/dL	0.9% CV	18.3 mg/dL	0.9% CV

The assay is simple to perform and provides an endpoint result in five minutes. It can be run on a variety of clinical analyzers between 405 and 465 nm. The Dri-STAT Enzymatic Bilirubin reagent measures all four fractions of bilirubin including the delta faction using serum or plasma.

Dri-STAT Enzymatic Bilirubin is lyophilized for long shelf life. It reconstitutes quickly and completely and is stable for seven days at 2°C to 8°C. The assay eliminated the use of harsh or caustic reagents present in conventional bilirubin reagents.

Applications procedures are available for these analyzers:

- Abbott ABA®-100, ABA-200, VP®
- Baker Centrifichem® 400, 500 and 600
- Roche Cobas Bio®
- Chemetrics® II
- ENI Flexigem™
- Hitachi® 705
- IL Multistat® II
- Pacer/Chemetrics®
- Technicon® RA-1000™
- Rotochem II/IIA

For information contact:- Alphatech or **Circle 38 on Readers Reply Card.**

BECKMAN REAGENT APPLICATIONS AVAILABLE FOR IL-MULTISTAT™

General purpose reagents from Beckman Instruments, Inc., perform with excellent results on the IL-Multistat™ from Instrumentation Laboratory. Both the Dri-STAT™ and Liquid-STAT® reagent products were developed for rapid results and exceptional performance to help improve efficiency in laboratories using this analyzer. Application information detailing operating parameters and performance data for both Dri-STAT and Liquid-STAT products is available on request.

For the IL-Multistat, Beckman's Dri-STAT chemistries are Acid Phosphatase, ALP, ALT, ALT (SCE), Ammonia, Amylase, AST, AST (SCE), Bilirubin (Enzymatic), BUN-rate, Cholesterol, CK, CK-NAC, CK-MB, CO_2, GGT, Glucose, HBDH, LD-L, LD-P (SCE), Triglycerides (colour), Triglycerides (UV) rate, Triglycerides (UV) endpoint, Uric Acid (UV) and Uric Acid (colour). Liquid-STAT chemistries are Albumin, ALP, ALT, AST, Total Bilirubin, BUN-rate, Calcium, Cholesterol, CK, Creatinine, Glucose, Iron-IBC, LD-L, Phosphorus and Total Protein.

Both Dri-STAT (reconstituted) and Liquid-STAT products have long stability to virtually eliminate wasted reagent and frequent preparation of reagents.

Laboratories with the IL-Multistat may request application data sheets or a convenient summary chart showing parameters for Dri-STAT and Liquid-STAT chemistries.

Contact:- Alphatech or **Circle 33 on Readers Reply Card.**

BECKMAN'S NEW EPSILON™ DIGOXIN BY EIA; ACCURATE, FAST, EASY

Beckman Instruments, Inc., introduces an EIA digoxin assay with superior correlation to RIA methods and simple to perform protocol. Results are ready in 40 minutes.

The Epsilon™ Enzyme Immunoassay for digoxin uses non-isotopic competitive binding to generate answers comparable to RIA accuracy over a wide diagnostic range. Advanced proprietary bead-coating technology applies an even layer of digoxin to all beads simultaneously. Results are consistently reproducible and demonstrate all correlation coefficent to RIA of (r) = 0.96. The assay shows no detectable protein interference or serum effects and minimal cross reactivity with steroids or related compounds.

The dynamic range of the Epsilon test is 0.5 to 8.0 ng/mL, with a minimum detectable concentration of 0.25 ng/mL. Both inter-assay and intra-assay CVs are under 10%. Only 50 μL of serum is needed, making this test usable for pediatric and geriatric patients.

The easy to learn protocol calls for one-step antibody incurbation — only one type setup and wash needed. A 15 + 15 minute incubation means fast turnaround of less than 40 minutes for the entire procedure.

The 60-tube Epsilon™ Test Processor captures beads for a quick, secure wash and results are read on a variety of instruments at 492 nm. Reagents are stabilized for long life at refrigeration temperatures, exhibit minimum lot to lot variation and high curve stability. The assay is packaged in a 100-test kit.

Digoxin is one of four tests in the Epsilon Immunoassay product line from Beckman. The other test kits now available are Epsilon IgE, TSH and hCG.

Contact:- Alphatech or **Circle 32 on Readers Reply Card.**

BECKMAN IgE BY EIA PROVIDES FAST, ACCURATE RESULTS

The Epsilon™ IgE Enzyme Immunoassay from Beckman Instruments, Inc. with one-step antibody incubation reduces hands-on time for fast turn-around. Proprietary test technology provides superior specificity, sensitivity and precision of IgE measurements in human serum.

The simplified Epsilon IgE assay uses established EIA methodology with a time saving, easy to learn protocol. Tubes are set up once for a single antibody incubation step and washed once. No sample preparation or dilution is needed and 30 + 30 minute incubations allows fast reporting of results.

A multi-site "sandwich" methodology is used. A monoclonal antibody on the bead picks up IgE providing specificity. A polyclonal antibody conjugate attaches to multiple sites on the IgE molecule for greater speed and accuracy. The Epsilon assay has a dynamic range of 10 to 400 IU/mL, excellent correlation with RIA procedures (r=.99), no measurable interference with IgG, IgA and IgM.

Intra-assay precision		Inter-assay precision	
IU/mL	CV%	IU/mL	CV%
25	5.2	22	11.5
77	7.2	82	8.4
155	5.4	157	7.0
345	9.8	355	8.8

Results are read at 492nm on any spectrophotometer, Abbott Quantum or Hybritech Photon. The Epsilon™ Test Processor was designed for use with the Epsilon IgE immunoassay kit. It provides easy capture, wash and transfer to bead for up to 60 tests simultaneously.

Contact:- Alphatech or **Circle 31 on Readers Reply Card.**

GC COLUMNS

A selection of fused silica capillary GC columns has been introduced by Pierce Chemical Company. Consistent, high quality columns are assured because Pierce manufactures it's own capillary tubing. Every column is tested with a modified grob test mixture to show it's separation abilities. The test chromatogram and column data sheet are supplied in the column package along with the test mixture. Columns are available with seven stationary phases, three film thicknesses, two internal diameters and three lengths.

For additional information contact:- Lab Supply-Pierce or **Circle 30 on Readers Reply Card.**

BECKMAN'S NEW EPSILON™ hCG BY EIA OFFERS SINGLE POINT CALIBRATION, SAMPLE CHOICE, RAPID RESULTS

Beckman Instruments, Inc. introduces the Epsilon™ Enzyme Immunoassay High Performance " Specific" hCG (human chorionic gonadotropin) test for serum or urine samples. The test offers a 15 + 15 minute qualitative protocol, a 20 + 20 minute quantitative protocol and an optional high sensitivity procedure. Single point calibration saves up to six tubes per run yet maintains exceptional accuracy. The test is easy to perform with one step antibody incubation — only one tube set up and wash is needed.

Advanced proprietary bead coating technology applies an even layer of monoclonal antibody on all beads simultaneously for a consistent, reproducible assay. Alpha and beta specific antibody pairs measure intact hCG with no interference from α and

subunits. The test is usable for diagnosis of ectopic pregnancy.

The Epsilon EIA test measures concentrations in two ranges — 2 to 400 mIU/mL and 0.5 to 100 mIU/mL. Results correlate with RIA — (r) = .98 — and protocols are short and easy to learn.

The assay can be processed on the 60-tube Epsilon™ Test Processor to capture beads for a quick, secure wash. Results are read on any spectrophotometer at 492 nm. It exhibits minimal cross reactivity with pituitary hormones or related compounds and requires sample volume of only 50 μL. It is standardized against the WHO first IRP (1975).

Each kit contains reagents and standard for 100 tests. Reagents are stabilized for long shelf life at refrigeration temperatures with minimum lot to lot variation. Other test assays in the Epsilon Immunoassay line are IgE, TSH and Digoxin.

Contact:- Alphatech, or **Circle 29 on Readers Reply Card**

MICRO-INJECTOR FOR BIO AND GENETECHNOLOGY

The implantation of small quantities of macromolecules into living cells by means of microcapillary injection was realised for the first time by both Graessman and Diacumakos. Since then micro-injection has become a vital tool for research activities in the fields of Cell Biology, Bio- and Genetechnology, Agricultural and Food Research.

Zeiss now offers a unique micro-injector which encompasses the following key features:

Injection volumes in the picolitre range. Three adjustable and foot-controlled injection pressures -

1. Holding pressure to prevent inadvertent aspiration of cell material
2. Injection pressure for precisely reproducible volumes
3. Cleaning pressure to clean and open capillaries

LED display of pressures, injection time and number of injections.

Acoustic signal upon completion of injection.

Foot control to positively prevent vibration being transmitted to the microscope.

Although practically no time is required for operator training, injection rates are typically in the order of 500 cells/hour as compared with manual systems.

For further information please contact:- Carl Zeiss New Zealand Limited, Mayfair Chambers, The Terrace, Wellington. Ph: 724-860, 724-861 or **Circle 28 on Readers Reply Card.**

MICRO-INJECTION STATION

To cater for the rapidly expanding fields of Bio and Genetechnology, Zeiss has released a range of new accessories for their ultra-stable non-focusing stage inverted microscopes. In co-operation with leading research centres a complete work station is now available. Consisting of a motorised micro-manipulator, automatic micro-injector, heating stage and an IM inverted microscope with long working distance objectives. This system is optimally configured for specific gene transfer, membrane fusion and perforation, patch clamp techniques, injection of fluorescence labelled substances and many associated tasks.

For further information please contact:- Carl Zeiss New Zealand Limited, Mayfair Chambers, The Terrace, Wellington. Ph: 724-860, 724-861 or **Circle 27 on Readers Reply Card.**

BECKMAN INTRODUCES HIGHLY STABLE LIQUID BUN RATE REAGENT

Beckman Instruments, Inc. developed a new BUN Rate Reagent for the Liquid-STAT™ line of stabilized liquid reagent products.

The new BUN Rate Reagent offers the clinical laboratory 21-day combined stability at refrigeration temperatures and three days at room temperature — significantly greater stability than dry BUN products with solution stabilities of one to seven days. Liquid-STAT BUN has applications procedures for major clinical analyzers including Technicon® RA-1000™; ENI Gemeni®; Baker Centrifichem™; Chemetrics II; Gilford System 203 and Impact 400; Abbott VP; Roche Cobas Bio; Hitachi 705; IL Multistat® III; Rotochem II; and Beckman Model 42 Clinical Chemistry System.

Bechman's new Liquid-STAT BUN Rate Reagent delivers results in 60 seconds with linearity of 100 mg/dL. The reagent helps increase lab productivity through superior performance and competitive pricing to reduce cost per patient reportable result.

Information and analyzer applications on Liquid-STAT BUN Rate Reagent may be obtained from: Alphatech or **Circle 37 on Readers Reply Card.**

NEW MICROSAMPLE ANALYZER FOR COAGULATION

Hatboro, PA, U.S.A. — The newly introduced Model 110P is the first fully automated coagulation instrument to operate on microsamples of plasma. This unique capability of the Model 110P proportionately reduces the quantity of reagents and controls consumed, resulting in substantial savings for the laboratory. The Model 110P is the only coagulation instrument to provide for the direct entry of the PT and APTT concurrently, in any order and in any quantity, without limiting throughput efficiency. This open-ended feature saves labour by eliminating the need to wait and batch samples by test type. Random samples may be entered at any time regardless of the type of test in progress. The Model 110P performs all routine coagulation tests including fibrinogens, thrombin times, and factor assays.

The Model 110P has been specifically designed to perform on microsamples of plasma, reducing reagent consumption by 75% of that required for existing coagulation instruments. This capability is the result of a newly developed submerged vertical optical detection system, termed SVO™, utilizing a near infra-red light source. The vertical orientation of the optical system enables the Model 110P to observe three hundred and sixty degrees of the clot during its formation. In contrast, existing coagulation instruments view the clot across a horizontal plane, limiting their view to a layer of the clot. This limitation significantly restricts their ability to operate on microsamples of plasma.

Additional reagent efficiency is attained with the Model 110P by means of an innovative repressurized reagent delivery system. This new method for dispensing microvolumes of reagents eliminates conventional pumps and the volumetric inaccuracies typically associated with pumps. The Model 110P reagent delivery system makes daily set-up unnecessary. No priming is required and frequent tubing changes are eliminated. The system is self-calibrating and self-purging reducing labour lost in reagent set-up and maintenance. Precision pipetting is eliminated as the Model 110P automatically aliquots the amount of plasma required, resulting in consistent reproducibility between technologists and shifts.

The continuous entry of test samples, randomly, improves efficiency in processing the daily coagulation workload by replacing the traditional practice of waiting to batch by test type. The microprocessor control circuitry of the Model 110P automatically calculates the most efficient sequence or fastest run order for the mix of test samples in progress. This feature optimizes the rate of throughput when simultaneously performing Prothrombin Times and activated Partial Thromboplastin Times. Since the Model 110P provides open access to the operator, "stat" tests may be turned around rapidly without disrupting the routine workload.

The Model 110P provides full push button control, displays operator prompts and warnings, and offers a complete complement of self-diagnostic routines. Each test is performed in duplicate with the results printed out individually and averaged. Patient identification numbers may be entered through the keypad and printed out with the results for record purposes.

For more information, contact:- Wiltons Scientific or **Circle 36 on Readers Reply Card.**

NEW HEWLETT PACKARD SOFTWARE TURNS UV/VIS SPECTROPHOTOMETER INTO LC DETECTOR

The new Hewlett Packard 89082A software package from Northrop Instruments & Systems Limited turns the Hewlett Packard 8451A UV/Vis diode-array spectrophotometer into a multi-wavelength UV/Vis detector for any HPLC system.

For laboratories that have the general purpose Hewlett Packard 8451A UV/Vis spectrophotometer, this software adds the powerful detection capabilities of HPLC. Hewlett Packard expects the product to find applications in many areas including life-science research, pharmaceuticals and the chemical industry.

The new software delivers two HPLC detection packages: LCQUANT for quantitative analysis of characterized samples for which the analytes are known and standards are available.

Quantitative HPLC

The quantitative module of the software, LCQUANT provides

accurate routine quantitative analysis of characterized samples for which the analytes are known and standards are available.

An advanced multi-wavelength, multi-component software routine developed by Hewlett Packard provides quantitation of resolved, merged or coeluting peaks. Up to 10 unresolved components may be quantitated per peak or peak group.

Multi-component analysis reduces the need for complete chromatographic separation of a sample in order to achieve total quantitative accuracy. Many samples that previously required gradient elution for separation now may be analyzed using isocratic elution. Similarly, many of those that formerly required long chromatographic runs to allow separation of early eluting peaks may be analyzed in a much shorter time.

Qualitative HPLC

The LCSURVEY module of the software delivers qualitative and semi-quantitative analysis of new and uncharacterized samples.

Simultaneous monitoring of multiple wavelengths of HPLC effluent aids in the identification of uncharacterized samples and decreases the possibility of failing to detect eluting components.

The systems locates overlapping peaks replotting specific wavelengths versus time at any point within the 200-mm scanning range chosen by the user. The wavelength range of the Hewlett Packard 8451 UV/Vis spectrophotometer is 190 to 820 nm.

Three features of the software allow the user to test peak purity: comparison with standard spectra, normalized spectra matching and wavelength ratio derivation.

Automatic comparison of unknown spectra with standard spectra provides confirmation of peak identity and alerts the user to the presence of impurities.

Spectra, which may be acquired manually or automatically, are collected at a rate of up to one per second during the elution of a peak. The system stores the spectra and makes them available for post-run processing. Peak purity can be evaluated by matching normalized spectra stored throughout the peak.

The system further confirms peak purity be deriving the ratio of absorbances of any wavelength pair or the average ratio of a pair of wavelength ranges for any or all LC peaks.

For further information contact Wayne Sprosen, Northrop Instruments & Systems Ltd, Telephone Wellington 886 658.

or **Circle 35 on Readers Reply Card.**

FOR SALE:

Gamma Counter, Phillips 4580
Single well, dual channel, 310 sample capacity changer.
Preset windows for I^{125} and Co^{57}
Plus user programmable panel complete with sample racks etc.
Requires output device such as a printer, HP 9815 etc.

Teleprinter, Olivetti TE 318
Suitable as output printer for the above, or separately.

Information and enquiries to:-

Mr G.F. Davis,
Medical Laboratory,
127 Grafton Road,
AUCKLAND.

Telephone 778-339

SITUATIONS VACANT

Staff Technologist Clinical Biochemistry

Applications are invited by appropriately qualified people who would be interested in the position of Staff Technologist within the Biochemistry Department.

Medical Laboratory is situated in central Auckland. The department is fully automated and handles a large volume of specimens per day.

Applications should be made in writing and addressed to:-

Personnel Department,
Medical Laboratory,
P.O. Box 4120,
AUCKLAND.

Enquiries are welcome by telephoning:
Auckland 778-331 collect.

Registered Medical Laboratory Technologists — Laboratory Assistants

A Lower Hutt private medical laboratory has vacancies in Haematology and Microbiology.

The Microbiology position which is graded is second-in-charge of that department.

Preference will therefore be given to applicants with Part III Microbiology. The Haematology vacancy is for a staff technologist. Laboratory Assistants with considerable experience in Haematology should also apply for this position.

Please contact:

The Personnel Technologist
Valley Diagnostic Laboratory
P.O. Box 30-044
Lower Hutt
or phone 699-185 Wellington

Technologist — Immunology Senior Position

Applications are invited for this Senior position within the Immunology Department of Medical Laboratory in Central Auckland.

This vacancy is for the second-in-charge position. Applicants should have a background of Immunology, Serology and Immunohaematology and be capable of supervising and training staff.

Applications should be made in writing and addressed to:-

Personnel Department,
Medical Laboratory,
P.O. Box 4120,
AUCKLAND.

Enquiries are welcome by telephoning:
Auckland 778-331 collect

IAMLT

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THE PRESIDENT'S VOICE

It doesn't seem possible that more than a year has gone by since our Congress in Perth. But, if the mail I receive is any indication, our member societies have been very busy in that time, as have your IAMLT representatives. At the June Council meeting, held in conjunction with the 1985 Annual Meeting of the American Society for Medical Technology, we learned that our various activities are progressing satisfactorily. (A report of Council Actions appears on page8.)

There should be many important items on the Agenda for consideration at our 1968 Congress in Stockholm. I urge all member societies to study and discuss the proposals and documents that will be coming to you in anticipation of the next GAD. If your association has any items to add to the Agenda, or any proposals for the GAD, please notify the Executive Office and send materials in time for proper distribution. Please don't forget to submit nominations for Council elections. In every member Society, there are capable interested individuals who have shown concern for IAMLT activities over the years. Won't you consider nominating them? It is important for the growth and advancement of Medical Technology that we identify persons who can continue work with member societies to meet the needs of all laboratorians.

As I was preparing this message for MTI, I received a memo from our hospital administration regarding long-range planning for our institution. It called to mind the comments I have received from members concerning the lack of long-range planning that has been a problem for IAMLT in the past. Traditionally, each new council would review the actions taken by the GAD, assign tasks and try to accomplish the goals set by the time of the next GAD. Most of the activity was concerned with short-term goals. Those who have served on the Council over the years know that conducting IAMLT business by mail and overseas telephone calls makes it difficult to complete more than short term goals, as everything moves very slowly.

Councils over the years worked hard to develop a plan for IAMLT, and I am certain past council members are pleased that we have begun to see some progress. At the 1984 GAD we made some significant moves to establish future directions:

approval of a full-time secretariat

: support of IAMLT/W.H.O. activities

: acceptance of the proposal to move toward the development of IAMLT'S role as a validating body

: requesting expansion of Dr. J. Antonas' paper on the future role of IAMLT.

Various committees are working to expand each of these and to provide definite and specific proposals for consideration by the 1986 GAD. In order to make appropriate decisions upon which to base our long-range goals, we need the involvement of all of you. Your experience, knowledge and expertise are valuable, as well as an indication of your needs, as we take action concerning the activities for the coming years. Please send your delegation well-prepared to discuss and decide our future role. When we convene in Stockholm, we must address ourselves not only to the issues and activities for the future, but also to the means of providing the funds to accomplish all we need. It is obvious that all member societies are not in the financial position to assume a dues increase. Thus, we must seriously review the options we have to supplement our dues dollars and provide the funds to do what must be done. IAMLT is **our** organization, the only unified voice for medical technologists around-the-world. We must all think seriously and plan well if the visions of those who began our organization are to be realized.

As we will be heading into the holiday season about the time this reaches you, may I take this opportunity to extend my very best wishes for health, happiness and a New Year filled with many blessings for you and your loved ones.

Shirl

INFORMATION NEEDED FOR NEW DIRECTORY OF MEDICAL LABORATORY SCIENCE PROGRAMS WORLDWIDE

Work has started at Northeastern University, Boston, on a **Directory of Medical Laboratory Science Programs Worldwide.** The collaborators, Prof. Britta Karlsson of the University's Medical Laboratory Science Program and Solveig Turner, Director of the Center for International Higher Education Documentation, mailed questionnaires to all IAMLT national associations as well as to the Ministries of Health seeking information about programs.

To date responses have been received from 28 countries so there is still a long way to go. The collaborators invite all colleagues to share information about their programs. Even if some information has already been received from a country, each additional brochure or letter adds additional dimensions to the study and is extremely welcome.

The **Directory,** which is designed to help laboratorians keep abreast of programs in other countries, also will be helpful for admissions and licensing personnel. The following information will be covered:

Country background (How training relates to the educational system as a whole; certification awarded; what agency is in charge of programs; institutions offering training)
Levels and Length of Study (Diplomas, certificates, awarded - length of study)
Entry Requirements
Scope of the Field (Specialized or unitary program; opportunities for further education; work sites)
Curriculum (sample)
Licensing and Professional Recognition
References

Please send correspondence to Prof. Britta Karlsson OR

Solveig Turner
Center for International Higher Education Documentation
Northeastern Univeristy
Boston, MA 02115 USA
Tel: 617-437-2770

EDITOR'S NOTE:

Responses have been received from the following countries, those marked with an asterisk* from a member society:

Australia*, Austria, Barhrain, Barbados, Belgium*, Central African Republic. Chile*, Costa Rica, Denmark, France, Hong Kong, Iceland, Ireland, Luxembourg, Malaysia, New Zealand, Netherlands, Norway, Phillipines, Rwanda, Jordan, Singapore, Sweden*, Switzerland, Taiwan, Tunisia, United Kingdom*.

CAN YOU HELP!

Dear Sir,

Health care for the poor who live in the slums of Bombay is woefully inadequate: facilities in Government hospitals are few and private care is too expensive.

In an attempt to solve this problem, we are planning to start a small (20 bed) non-profit making hospital in Bombay, as a pilot project, to see if it is feasible to provide inexpensive quality care using "Appropriate Technology".

We wish to provide the best care possible including Laboratory, Operating Theatre and X-Ray facilities.

We would appreciate information, literature and advice in the following areas for our project:

- Education: materials and methods
- Health facilities equipment and supplies
- Laboratory equipment
- Medical records
- Sterilization

We obtained your address from the Appropriate Technology for Health Directory, published by the W.H.O.

Thanking you for your assistance,

Yours faithfully,

Dr. C. N. Malpani,
Medical Director.

The Community Health Research Programme
Ashish Tardeo Bombay 400 034

FUTURE CONGRESSES

CHILE - 3rd Congress of Medical Technologists

The above Congress will be held on November 6 - 8, 1986, in Pucon, Chile. The area is famous for its natural beauty and is in the region of the lakes in southern Chile. Members of IAMLT, especially Latin American members, are invited to participate in this event which will cover: Microbiology, Parasitology, Clinical Bioanalysis, Haematology, Immunohaematology, X-Ray, Radiotherapy, Opthalmology, Otorhinolaringology and Cytodiagnosis. Further details may be obtained from Freses Solis Flores, President, Colegio de Tecnologos Medicos de Chile, A.G., J M de la Barra 480 - Depto 405, Clasificador 303, Santiago, Chile.

IMLS Triennial Conference

The host town for the 18th Triennial Conference of the Institute of Medical Laboratory Sciences will be the City of Southampton, a major sea port on the edge of the New Forest with its delightful little villages redolent of the spirit of old England. Access to the city is excellent with fast trains (70 minutes) to London every hour, a motorway (M3) within 13 miles of the city and a regular bus service connecting the city with both Heathrow and Gatwick airports. Eastleigh Airport, which has regular services to Paris, Le Touqet, Cherbourg and Amsterdam is very close to the conference venue.

There will be five days of scientific programme in five lecture theatres each having 200 or more seats and an exhibition area of 23,000 square feet. Accommodation will be in the university halls of residence which are all within 20 minutes' walk of the main campus though there will be a shuttle bus for those not wishing, or able, to walk. The cost for the whole week, 17 - 23 August, including scientific sessions, social programme, and full board with accommodation in single rooms is likely to be about £150. Full details and registration forms will be available in January from the Institute of Medical Laboratory Sciences, 12 Queen Anne Street, London W1M OAU, Telephone 01 636 8192.

2nd ASEAN Conference in Medical Laboratory Technology

Abstract forms for the use of authors are now available for the above conference being held in Manila, Phillipines, from 24 - 28 November, 1986. English is the official language for all discussions, proceedings, publications and other activities. In addition to a series of scientific plenary sessions and lectures there will be a number of panel discussions and workshops, the latter for various grades of members.

Further details can be obtained from: Secretariat, 2nd ASEAN Conference in Medical Laboratory Technology, Room 303-304, NFWC Building, Escoda cor. San Mercelino Sts., Ermita, Manila, Phillipines.
Telephone 50-73-91.

One of the characteristic narrow streets in the old city

STOCKHOLM - 1986

Preparations for the 17th IAMLT Congress are advancing successfully and the organisers are most encouraged by the support being given by medical laboratory scientists and commercial producers from many countries. The programme is in the process of preparation and the emphasis will be on a multidisciplinary approach covering both advanced technology and appropriate technology for peripheral laboratories in developing countries.

Included in the scientific programme will be sessions on education, training and management. As the work of the Scientific Committee has progressed so successfully the closing date for abstracts has been extended to **1 JANUARY 1986.** Forms should be returned to SLF who will notify authors whether they have been selected by the end of February.

The Executive Director on behalf of IAMLT, and in collaboration with World Health Organisation, is organising a conference for health laboratory workers, teachers of health laboratory technology and those who manage health laboratories in developing countries entitled 'Laboratory Technology in Developing Countries'. In addition to a series of lectures, a large group of international advisers with a wide experience of health laboratory technology and education in developing countries will be available for consultation on an individual or group basis. Additionally, advisers will be available to conduct seminars on topics requested by participants. The conference organisers and the executive office are willing to assist participants in making contacts and arrangements to visit specific laboratories in Europe to gain experience in particular techniques. Further details may be obtained from The Conference Secretariat, Box 1617, S-11186, Stockholm, Sweden.

The scientific programme and trade show are to take place at the Stockholm International Fairs and Congress Centre, Massan, nine minutes from the Central Station. A free transportation ticket will be supplied to all registrants which allows free transport on this train and other public transportation in the Stockholm area. There is plenty of car parking space at Massan and it is an easy drive, though drivers should remember that the drink and drive laws in Sweden are strictly enforced.

SOCIAL PROGRAMME

An exciting social programme is being arranged with many interesting tours in Stockholm and its surroundings during the week. Tours included in the registration form are a boat tour along the waterways under many of the 52 bridges connecting the 14 islands on which Stockholm is built, a tour through both the old and new parts of the city, Drottningholm Palace and -perhaps the best trip of all - an evening boat trip through the inner part of Stockholm's unique Archipelago and dinner with entertainment on one of the islands near Waxholm.

The opening ceremony will take place at the Stockholm International Fairs on the Sunday evening and be followed by the President's reception. On Monday participants will be invited into a Swedish home for local hospitality, a venture which was so successful in Perth. Tuesday evening there is an invitation to a Buffet Reception given by the City of Stockholm and the Stockholm County Council at the City Hall, situated on the waterfront in the centre of Stockholm and internationally famous as the venue of the annual Nobel Prize Award ceremony. There will be a grand festival final in the form of a Banquet Dinner on the Friday to close the proceedings. To date the Wednesday and Thursday have been left free to do as you like, but with boat trips serving as many prawns or as much herring as you can eat during the four hour cruise for SEK 99, a barn dance on a cruise for SEK 44, cinemas at SEK 35 or fish for free in the centre of Stockholm who wants to be organised every night.

Sailing in front of the Stockholm City Hall

The Glass Obelisk, one of the well known landmarks in the City Centre

There was a time when Sweden was looked upon as being very expensive, but this is no longer so. Many restaurants serve salad lunches including coffee for SEK 30 - 40, while A la carte prices are as follows:

salmon dishes SEK 65, meat dishes SEK 90,
Deserts SEK 35, wine per bottle SEK 70,
beer SEK 10, coffee or tea SEK 6.

Business lunches are available from 11.30 to 17.00 hours and cost from SEK 80 - 115, whilst Chinese meals cost from SEK 40 - 70 and a Scandinavian Buffet including meats, herring, salad and sweet will cost SEK 60. The entrance fee to museums and historic houses is either free or a charge of SEK 8 - 15 is made, but there is plenty to see walking around this beautiful city. There are free concerts in the churches and parks, the Royal Opera has seats between SEK 30 and SEK 100 and Concert Hall seats are about SEK 50. For art lovers the famous Stockholm Underground is a 'must'. Known as the longest art gallery in the world, it is 108 kilometers long, it contains sculptures of wood, stone and iron, oil paintings, giant painted grottoes, wall carvings, all included in your transportation ticket.

HOTEL RESERVATIONS

A number of hotel rooms in different categories have been booked for Congress week, most of which are located near to the Central Station from where the commuter train leaves for the Congress centre. Examples of the categories Booked are:

A	B	C	D
Sheraton	Amarenten Continental Terminus	City Tegnerlunden	Domus Jerum

The standard of Swedish hotel rooms is in general rather high so all rooms in categories A, B and C and most of them in D have private bath/shower and toilet. During the whole week there will be a special hotel appointed as a 'get-together-place' where there will be a general meeting point. The organisers are aware that room prices in Stockholm seem high, SEK 250 - SEK 800 per night, and advise visitors either use group travel with their colleagues or package tours. Agents in other countries can usually obtain considerable savings on travel combined with hotel accommodation and one can still use the hotels proposed in the invitation programme. Travel agents in Europe and the United States offer Swedish Hotel cheques to cover the costs of rooms in some hotels.

Those travelling from outside Europe should compare the costs of travelling via Amerstdam or London. There are frequent flights from both these airports to Stockholm.

FURTHER DETAILS

The invitation and preliminary programme is planned to be distributed during November. These will be available from Member Societies or SLF, Ostermalmsgatan 19, S-11426 Stockholm, Sweden,
Telephone +46 8 22 58 40.

GETTING WHAT YOU WANT WANTING WHAT YOU GET

These notes formed the basis of a lecture given at the Laboratory Technology Conference for the Arab World held in Dubai, February 1985. Fuller documentation is available from the author, Desmond Philip, Principal Medical Technologist, Middlemore Hospital, Otahuhu, Auckland, New Zealand.

Ensuring that what you get is what you want is not something that just happens. It requires to be worked at and worked at hard.

Moving from the situation where you need to get what you want to wanting what you get requires a **planning process** which can be divided into seven steps.

ESTABLISH NEED

Important step to justify purchase to administrators. The need has to be established in consultation with your users and your senior laboratory staff. It may either be a requirement for a particular test to be introduced or it may be a need to perform a current test in a better way. It may be a need to replace instrumentation
- amortization,
  non functioning or inadequate

Needs and wants are not the same. Wants are often whimsical - such as when instruments are seen at exhibition, "keeping up with the Jones'" - computers are an excellent example. WANTS may come from either laboratory or from users (clinicians). If the need is not established we end up with equipment unused (uneconomical) or as bad, work created to merely use an instrument and justify a wrong purchase. This will always lead to staff dissatisfaction - results are not being used, questioning as to why it is done.

DEFINE REQUIREMENTS
The next step is to define our requirements. This step must be done with meticulous care otherwise chaos exists later. Take into account as many requirements as you possibly can and list them in detail. Do it from the Lab's point of view (analysis)
The clinician's view (accuracy required etc.)
the patient's (sample size availability)

Some things to be considered:

1. **Throughput** - how many will there be per day, -now and anticipated (be realistic). There is no point in having something that does 500 tests in an 8 hour period if your requirement is only for 50. You will undoubtedly pay much more for the privilege of owning an instrument which you do not require, always look at maximum numbers required - peak requirements.
2. **Sample size.** Paediatrics versus adults. General principle: not to take more than required.
3. **Turnaround time.** Do you have urgent requirements - emergency departments, intensive care unit, etc.
   Patients at clinics waiting for results.
   Clinicians requirements - e.g. prescribing treatment
   renal dialysis patient
   hyperalimentation
4. **Precision and accuracy** - what do you require - note it down in detail.
5. **Stat needs** - do you run 'around the clock' service. Can the instrument handle this. Do you have 'call outs' for emergency work. What are the start up times required.
6. **Future requirements.** Think of these provided they are not just wants rather than needs. For example you may know of a new ward or a new unit being built in a years' time - Forward planning.

As you define requirements also define the limits you can accept. Do this in consultation with all involved. Do it realistically and specifically. Do it accurately at this stage and it will save the agony of compromise later. Do not be tempted to match your "requirements" to an instrument that you think you would like to have. We will consider this in more detail later. Be honest with yourself at this stage and you will find it easier later to justify your purchase.

BEWARE THE GLOSSY!!!

In this regard strongly resist the temptation to use the manufacturers "glossy" as your guide for requirements. Don't ignore them - they can have good suggestions and sound advice but relate them to your situation.

DEFINE RESOURCES

The next step is to define our resources. Do this with as much care as you defined your requirements. Nothing is worse than getting an instrument that is capable of meeting your requirements but where you are unable to meet the instruments requirements.

Staff - what is their level of training and expertise - no point in purchasing an instrument that requires a deep level of technological skill and academic knowledge if you have staff with limited training and expertise.

Money - pressure on the health dollar is everywhere. Most of us have to plan in advance and set aside specific sums of money. This will probably need to be done in liaison with administrators and take into account total hospital requirements. If you need to set money aside at this stage and you have to do this as a specific amount (i.e. predict) then you need to cast around (journals trade exhibitions, manufacturers bulletins etc.) and find a few instruments that fit your needs and allow monies based on the price of these. This does not mean you are going to purchase one of those particular instruments.

Space - is there a limitation on available space - is there a particular spot for the instrument to go.

Power and Services - are there gases available? water? power supply? Is it adequate? Is it conditioned? Note that power for computers and micro processors these days needs to be without transients, surges, spikes and gliches etc. You may need a C.V.T. or U.P.S.

Any other resources that need to be considered as possible constraints on type of equipment that can be ordered.

ESTABLISH CHANGES THAT CAN BE MADE

In a similar way to that used for requirements establish the limits of change that can be made in your resources. This is not as important at this stage as it was in establishing the limits in requirements but should be considered and noted. No administrator wants to be faced with extra requests AFTER he has bought your requested item.

CALL TENDERS

You are now conveying to a seller in clear terms what you require.Therefore you list in detail your specific requirements. All those things we thought of before, list manuals required (operating and maintenance) list safety codes (wiring etc.). Power requirements, voltage and cycles.

Constraints - list only those which you feel are not changeable, for example, compatibility with specific instrument such as a printer for a micro-processor or an accessory to be attached to a specific instrument. Don't list your financial constraint if you have one.

Lock-outs, can be taken to ridiculous lengths, for example, quoting specific sizes. Only in exceptional circumstances use lock-out tenders. You do yourself no favours by not seeing what's around, both for price and for range.

As above we list only the unchangeable constraints and even then write the terms in such a way that it is possible to look at a range of instruments and consider if your resources (i.e. constraints) can be changed. Put clear closing times on tender and let it be known that you abide by this time. Who do you send tenders to:
establish list of suppliers

EVALUATE TENDERS

When we come to evaluate tenders we appreciate the care with which the first steps have been taken. If these have been meticulously done more than half your job is already over.

Important for laboratory to evaluate, not administrator, who may look at $ or look at some other aspect e.g. favoured firm for some other reason. Make the decision as near the periphery as possible.

Purchase price is not the only consideration but we must establish if it covers everything. If not, what is the true cost. Having considered everything you may want to dischard those that are grossly out of the price range.

Fixed costs - how do instruments compare in terms of:
purchase price
options
installation (basic supplies such as power, gas, etc.)

Running Costs - compare instruments in terms of reagents - calibrators and controls. Are the reagents locked in. Do I have adequate supplies of such things as water at the right quality.

Consumable costs - compare the instruments in terms of consumables such as I.S.E.'s, rotors, cuvettes (query locked in), paper, gases, etc. Are there hidden costs. Are they recurring costs. What sorts of costs can I anticipate for maintenance. What are the service contract terms.

Manuals - Are the Operator and Service Manuals provided? Are they of a satisfactory standard? Are they in your language? Have they been translated accurately and understandably?

Agents - what is the agents record from your own experience or from what others can tell you.

Availability - compare service availability - local, national or international. Is service performed by agencies own personnel and workshop or is it subcontracted out.

Parts availability - are parts held locally? What is the time for procurement? No use waiting for long periods for parts.

Trouble-shooting - how much service can be done by the operator as compared with needing to get in a serviceman? What training is available to accomplish this.

Downtime effects - what will be the effect to the department of downtime? ?Back up available.

Physical size - will the physical size fit in to your laboratory situation or into a rearranged laboratory.

Durability - is it well engineered and manufactured -you will probably need to sometimes make inquiries from other users about this.

Degree of mechanisation - consider the degree of mechanisation and micro-processor control. Is it something than can be handled by your staff in your laboratory? Can the staff be changed?

Safety - does it contain the safety features that you require.

Options - what are the various options that are available. Which one suits you best.

Temperature stability. - If there are kinetic systems can you guarantee temperature for reactions.

Adaptability - can the instrument be used in conjunction with other systems within your laboratory e.g., external data handling systems.

Technology - does the instrument utilise any new and untried technology.

Obsolescence - what is the likelihood of the instrument being rendered obsolete by its manufacturer or a competitor before the end of its useful working life. Is state of the art technology employed.

The question we now ask ourselves is "Will it fit in my laboratory - with my staff - with my conditions? Can it be made to fit?"

Ergonomics

How will the instrument integrate with existing work flow and projected work flow.

What training courses are offered - within your laboratory - at a manufacturers centre - at an agents centre. Is the cost of training included in the price or is it an extra.

What level of staff will be required to operate the instrument. Is it compatible with the staff that I have in the laboratory - can I retrain staff to handle the instrument. Will it require a reduction in laboratory staff requirement. How does this fit in with the laboratory philosophy to help provide jobs or to maintain professional opportunities. More staff required? Can this be done?

ANALYTICAL ASPECTS

Does the performance of the instrument and its flexibility meet up with the specifications and needs that I have within the laboratory. What is its throughput - does this meet up with my requirements. What is its stated precision and accuracy - does this meet up with my requirements. Are the capabilities of the instrument expandable in the future. How long does it take to start up the instrument - is this compatible with my laboratory requirements. Will it do as a Stat instrument. Do I want to use it as a stat instrument.

How available is it. Do I need it for 24 hours a day and will it perform for 24 hours a day (or perhaps it needs a period of shutdown for cleaning).

SAFETY

Electrical - does it conform to your laid down specifications. Does it meet the state, or your hospitals' requirements - all hospitals should have a definite laid down electrical code.

Mechanical - are there projections, are there guards. Are there safety locks for instance on the lid of centrifuges. Are there safety locks on electrophoresis baths etc., etc.

Microbiological - is there an ability to clean up spills easily. Is there staff safety when they are using? Does it produce aerosols?

CONSUMER OPINION

Who else has the instrument. Where are they. How many instruments are manufactured. How many are available locally. What do other users think of it. Ask specific questions and survey if necessary. When you are doing this ask the specific questions that you want answered and don't just leave it to your reviewer to supply you with the answers that he might think you need. He will never tell you about the bad points in any case, because they reflect on his wisdom when he purchased. Have you any experience of the instrument yourself. Talk to colleagues.

EVALUATE

One method is to write "specifications" across the top and leave a column for price, write the instruments down the side and then mark off all specifications that are met exactly with a tick and if they are within the previously determined limits outside the exact specification, make a note. If the instrument does not meet specification mark with a cross.

We can now see how important it was for us to have set our limits, we are not now faced with the agony of a decision as to whether we will let any particular instrument in or not because it will clearly either fit within our specific ation or fall outside it.

We can now go down our grid and pick out all the instruments that

(a) exactly meets specifications.
(b) meet specifications within established allowable limits.

Try to avoid going back and re-evaluating your criteria because any one particular instrument appeals but misses out on one or two specifications. Almost always you will regret a purchase made this way.

Is there one that most closely meets specifications? Maybe more than one? Now consider price. If there are several that meet specifications exactly or acceptably and have passed all your evaluations, then the lower

price will be a good buy - don't feel uneasy, cheap does not necessarily mean nasty. If you have done your preparation well and you have followed the steps that we have been considering exactly you almost certainly won't be disappointed.

Try and get a demonstration and try to have it as a "hands on" one. You may have to get agent to take you to a place where there is an instrument.

Better still, try it in your situation and with your workload and with your staff. An ideal not always available.

In essence your total evaluation has looked at
requirements
resources
constraints

SELECT

In the light of your experience, your exptertise and your careful preparatory work you balance these as we have discussed to. Make a selection.Don't worry, your work's nearly done -you are nearly there. The instrument is nearly yours, but don't spoil all the good work with sloppy presentation at this point.

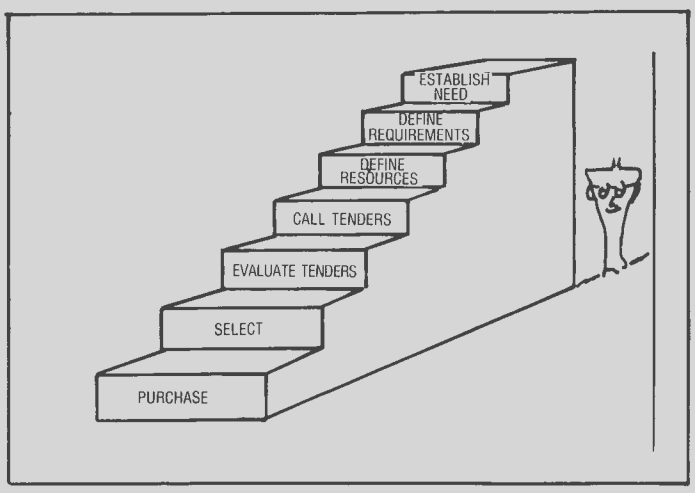
Almost certainly someone administratively is going to need your recommendation of which instrument to purchase. You owe it to yourself, your staff and your users to now present the case in a clear, simple yet comprehensive way:

(a) your **justification** as to why you chose this instrument - you have done this work and all you need to do is summarise your needs, your requirements and your resources and show how chosen instrument matches. State why particular options have been chosen.

(b) **Documentation** - document clearly:
the recommondation
the seller
the options you want to purchase (especially if there have been several offered to you within the quotation)

(c) **Presentation** - remember you have been intimately involved with this decision - you are now asking someone (a person or a committee) to commit money (perhaps a lot) on your decision. They do not want to be involved in a lot of perhaps meaningless, technological, detail and jargon, but they need to be fully informed - they also have to answer for their decision.

Applications may fail at this stage because of poor presentation although all the early work was well done.



PURCHASE

Buy it. We've made it! The order is placed - State clearly
options selected
agreed price
delivery dates, training etc.
inform unsuccessful tenderers

- we are about to take possession. All your hard work is going to be worthwhile. Your instrument is going to be ideal.

You followed all the steps.

You have one management exercise left - REVIEW your purchase after is has been in use for some time.

REVIEW

The way you established the need.
The way you defined your requirements.
The way you defined your resources.
The way you called your tenders.
The way you evaluated your quotations.
The way you selected your instrument, and most importantly how the instrument has been working in your situation.

This will be a learning process and help you to your next purchase.

SUMMARY

Impulse buying - buying from glossies - buying without proper consideration will more often than not result in an instrument that is ill fitted for your needs or at the worst unusable.

Follow the plan I have outlined and I guarantee you won't have that problem.

NEWS FROM THE EXECUTIVE OFFICE

Xth European Congress of Pathology Athens 2-6th September

The Executive Director and Dr Carol Gleich (member ASMT, USA) were invited to give a series of papers at the above event, on the themes of Training of Health Laboratory workers, Continuing Education and Qualifications.

WHO and IAMLT

The Executive Office is collaborating with WHO in the following activities:

16th Sept - 5th October: Sofia, Bulgaria: Regional Training Course for Laboratory Tutors

27th Oct. - 31st October: Madrid, Spain: Consultation in Biosafety. A group of international experts will consider current practice in Biosafety, with the Executive Director contributing a paper on "Training of Laboratory Staff in Biosafety" and Mr. Chris Collins (IMLS, UK) presenting a paper on "Workers Health".

11th - 14th November: Lisbon, Portugal: Workshop of Appropriate Technology for Primary Health Care Development. The Executive Director will contribute a paper on "Training and Education of Laboratory Personnel in Primary Health Care Development" and act as Rapporteur in collaboration with the President of the British Medical Association. Most countries in the European Region of WHO will be represented by senior Health officials and Directors of Laboratory Services. Besides IAMLT, other collaborating organisations include European Union of Medical Practitioners and the International Federation of Voluntary Health Service Funds. International representatives of industry and insurance have also been invited.

21st November - 6th December: WHO Evaluation Visit to Nairobi (Kenya) and Addis Ababa (Ethiopia). The Executive Director will be collaborating with Professor Per Lous (Copenhagen) on a WHO/Danish Government project to evaluate previous Tutor Training and Quality Control courses. Additionally, they will be preparing for an all African course for tutors, to be held in Nairobi later in 1986.

9th - 17th December: Geneva, Switzerland: WHO Expert Committee on the Role of Hospitals at the First Referral Level. As a result of a number of initiatives and papers written by the Executive Director, he has been invited as a Consultant to the above meeting and to prepare a submission on the subject "Laboratory Diagnostic Support for Health Care Activities in the Community".

Member Associations are invited to send their written contributions to the Executive Director, should they wish information to be included in his various submissions.

IAMLT AWARD PROGRAMME
SUMMARY OF AWARDS AVAILABLE

Donor	*Conditions*	*Prize*
ORTHO DIAGNOSTICS INC., USA	Educational award on recommendation (special application form)	Attendance at a one-week course in immuno-haematology for 3 persons
GENERAL DIAGNOSTICS WARNER LAMBERT, USA	Papers in the area of Quality Control, Clinical Chemistry, Immunohaematology, Coagulation, Microbiology.	US $1,500
MERZ + DADE SWITZERLAND	On recommendation for "Outstanding services to Medical Laboratory Technology".	Sw. F. 2,000. Also travel and hotel expenses for International Congress
BIOMERIEUX FRANCE	Papers in an area of clinical diagnosis, such as Microbiology Clinical Chemistry, Coagulation. Prize will not be awarded for any study involving the use of competitors' reagents.	Fr. F. 5,000
AMES-MILES USA	1 award for best paper submitted on "Immunology" from each of the following regions: Europe and Africa America and Caribbean Latin America Far East Region Japan Region. There must be at least 3 papers from each area before an award will be granted.	Each award:- US $2,000
IAMLT	Scholarships - on recommendation	US $750

Detailed information on the conditions of each award are available at the individual societies of IAMLT.
All applications have to be sent **IN TRIPLICATE** (typed or block letter) to the Executive Office of IAMLT at Mast House, Derby Road, Bootle, Merseyside, L20 1EA, England.
Deadline : 30th November 1985
Application form for the Ortho Diagnostics Educational Award available at the Executive Office.
For the awards requiring a paper, the winner will be notified about the possibilities of presenting the paper at the Congress in Stockholm.

IAMLT COUNCIL 1984-86

President: Shirley Pohl, 310 Springbrook Boulevard, Dayton, Ohio 45405, United States of America.
President-Elect: Dennis Slade, 14 Penn Lea Road, Weston, Bath BA1 3RA, United Kingdom.
Past President: John R. Neal, 2 Currawong Drive, Gooseberry Hill, Perth, Western Australia 6076.
Treasurer: Desmond Philip, Pathology Department, Middlemore Hospital, Private Bag, Otahuhu, Auckland, New Zealand.

Ordinary Members:
Helen DuBoje, Fuglesgardsvej 8, 2820 Gentofte, Denmark.
Ulla-Britt Lindholm, Klin Bakt Lab, Regionsjukhuset, S-90185, Umea, Sweden.
Graham Smart, Pathology Department, Southampton General Hospital, Tremona Road, Southampton, United Kingdom.
Genji Suganuma, 5-24-5 Yoyogi Shibuya-Ku, Tokyo, Japan.

1985 IAMLT COUNCIL MEETING
Orlando, Florida, U.S.A.

Progress reports were received from the Executive Director and all Council members. Council:

1. noted resignation of Sydney Yuen due to his emigration from Hong Kong and agreed to function with eight members until the 1986 GAD.
2. agreed that IAMLT should not be involved in comparisons of standards and qualifications between countries, but should be involved in helping a country's training and examinations to be matched to its requirements.
3. noted contacts with potential new member societies from Thailand and the Phillipines.
4. agreed that candidates for Awards be required to provide proof of their membership of an IAMLT member society.

Venue of the Council Meeting

5. agreed to support the application of the newly formed Norwegian Committee of Medical Technologists should application be made in 1986,
6. requested the Membership Committee to investigate methods whereby the process of application for membership could be speeded up and report to next Council Meeting.
7. discussed the several proposals received for an alternative system of subscription fees and recommended that no action be taken at this time as the existing system contains fewer disadvantages than the alternatives offered.
8. agreed that the Executive Director would write to member organizations informing them of Council's recommendation regarding subscription fees and providing supporting documents showing proposals considered.
9. authorized the Executive Director to write to those member societies who have difficulty in paying subscriptions, quoting Article 4.2 of the Statutes.
10. supported the proposal of the Institute of Medical Laboratory Sciences, UK, to amend Article 7.2 of the Statutes. (This will be circulated as a "Notice of Motion" at the appropriate time.)
11. agreed that support other than financial should be given to regions undertaking any activity where a common aim or goal exists.
12. agreed that G. Suganuma proceed with compiling a questionaire to be ready for circulation to the 1986 GAD as part of the report of the Technology Committee. (Assessment of the questionaire to be prepared for 1988 Congress.)
13. discussed the concerns put forward by several member organizations regarding the pre-GAD meeting and agreed that this matter should be considered by the GAD, together with a suggestion that elections be held earlier in Congress week.
14. agreed that a Prospectus of Projects should be drawn up in support of future applications for funds. Council members will provide lists to the Executive Office.
15. agreed that IAMLT be involved in appropriate target areas of the WHO Global Medium Term Programme and that specific topics be offered to specific member societies or to specific people where it is known that related work has been done.

Members at work

16. expressed gratitude to the Executive Director for waiving a portion of his salary until such time as extra funds become available.
17. agreed that the Executive Director request the Auditors to prepare a report on the true cost of the Executive Office, with project costs to be calculated, including administration costs.

Visiting the EPCOT Centre

Member at work

18. reviewed the new working arrangements of the office and, in view of the lack of success in obtaining additional funds, resolved that no further development of the executive office be undertaken at this time.
19. agreed that non-Council members with necessary expertise may be included on Sub-committees.
20. agreed that individual membership in IAMLT not be considered, but that individual subscriptions for Med Tech International can be made available.
21. agreed that Corporate Sponsorship could be offered to commercial firms or organizations having an interest in Medical Technology, and asked the Executive Director to write all member organizations inviting their comments.

The next Council meeting will be held on July 31, August 1 and 2, 1986 at the office of the S.L.F. in Stockholm.

Members at work

APPRECIATION

IAMLT expresses sincere thanks to the following:

For sponsorship of Coffee-breaks, a Luncheon and a Dinner for IAMLT Council during the 1985 Council meeting in Orlando:

Ames Division, Miles Laboratories, Inc.

Fisher International

Margaret Carroll

Bill and Theresa Frick

Dennis Weissman, Washington G-2 Reports

UltraChem Biomedical Laboratory

Good Samaritan Hospital and Health Center, Dayton, Ohio.

Members at leisure

NEWS FROM MEMBER SOCIETIES

U.S.A.

The joint meeting of American Medical Technologists and the American Society for Medical Technology, which was held in Orland, Florida in June 1985, was rated outstanding by those who attended. The registration was 3,690.

During the meeting Mary Briden was elected to serve as the 1985-1986 ASMT President. The House of Delegates approved new Bylaws and voted a 10% increase in membership dues.

Those who attended the Scientific Programs were asked to submit evaluations. These evaluations indicated that participants wanted more workshops and educational sessions. Therefore, the Program Committee for the 1986 meeting is planning a very comprehensive scientific program to include an increase in the number of educational opportunities.

The 54th ASMT Annual Meeting will be held June 22-27, 1986 in New Orleans, Louisiana. A cordial invitation is extended to IAMLT members to visit the U.S.A. and attend the ASMT Meeting. Preliminary programs will be available in March 1986 and can be obtained by contacting:

The Board of Directors of The American Society for Medical Technology recently announced the appointment of Anthony J. McNeven as the ASMT Executive Director.

ASMT
330 Meadowfern Drive
Houston, Texas 77067

INTERNATIONAL CO-OPERATION OF THE NORWEGIAN ASSOCIATIONS

Today, Norway has two associations for medical laboratory technologists: The Norwegian Association of Physiochemists, (NF), and the Association of Medical Laboratory Engineers, (MLF).

NF and MLF have met several times in 1984 to discuss international co-operation and the possibilities of a joint IAMLT membership. The discussions have led to an agreement which stipulates that NF's IAMLT membership shall be seen also to include MLF. This agreement enters into force as of 1985.

A committee made up of representatives from both organisations has been set up. It is to be known as the Norwegian Committee of Medical Technologists, NCMLT. NF is to act as the Committee's secretariat. The Committee's task will be to co-ordinate the Norwegian co-operation with IAMLT. Nordic co-operation will also be an important part of its activities.

Co-operation between the Norwegian associations is nothing new. For instance, members from both NF and MLF sat on a committee appointed by the Norwegian Government to clear up the possibilities of introducing identical basic training courses for all types of medical laboratory personnel. There are plans to introduce this new, common education, as of September 1985. For this purpose an advisory council of medical doctors, civil servants and representatives of NF and MLF has been set up.

NF and MLF feel that where there are several laboratory personnel organizations in a country, they should work together, expecially internationally. In consequence, Norway has preferred a joint IAMLT membership.

We hope that Norway's committee for international co-operation may lead to similar joint committees being set up in other countries, and that Norwegian co-operation with laboratory personnel organizations abroad will be extended and intensified.

ADDRESS: ncmlt, c/o Norsk Fysiokjemikerforbund, Ovre Slottsgt. 17, 0157 Oslo 1.

Editors Note: The above is published to show there is co-operation between societies in Norway. It is assumed they will be seeking IAMLT membership at the forthcoming General Assembly of Delegates.

THE INTERNATIONAL ASSOCIATION OF MEDICAL LABORATORY TECHNOLOGISTS

THE FIRST TWENTY FIVE YEARS, 1954 - 1980

By Guy C. Pascoe, M.B.E., F.I.M.L.S.

Part I

This is an account of the early days of the Association by one who was associated with it for much of that time as Recording Secretary, Council Member, Editor, President and briefly, as Executive Director. For details of much of the formative years leading up to the 10th Anniversay year, 1964, I am indebted to Honorary Member, Elizabeth Pletscher, whose keenness and foresight brought about the formation of the Association. For the rest of this account I have depended upon memory, a review of some Council Minutes, some early editions of the 'Newsletter' and upon other Association publications and any reader with better memories is asked to excuse any errors or omissions that may be detected.

1. When we review the history of the Association we first have to consider the origin of the profession of medical laboratory technology. In the latter half of the last century, rapid advances were being made in the medical sciences of bacteriology, haematology, clinical chemistry and histopathology by famous men all over Europe, e.g. Semmelweis, Austria; Pasteur, France; Lister, United Kingdom; Koch and Virchow, Germany, and Rontgen discovered X-rays. These workers rapidly found that as the discoveries grew they were themselves unable to cope with all the involved techniques. Therefore helpers were needed and these were mostly wives or unmarried sisters of doctors who were trained on the spot and had to help on a voluntary basis. In pathology, boys who had been engaged for cleaning purposes were gradually trained. The need for educated and trained helpers was first felt in Germany and the very first school for medical technology assistants was founded in Berlin early in this century. These assistants were trained in all laboratory techniques as well as in X-ray work. In Switzerland the first training school was inaugurated in 1927, teaching both laboratory technology and radiography initially, but soon the two professions separated and developed. In all continental European countries schools gradually developed, training only girls. In the meantime another pattern of 'on-the-job' training developed in the United Kingdom where mostly boys were accepted.

Practically no contacts existed between workers from the different countries and it was only after World War II, when it was again possible to travel and to communicate, that the first news from other countries reached Switzerland where the profession was already well established. Here Elizabeth Pletscher, chief technician at the Frauenklinik of the University of Zurich, tried hard to get contacts, encouraging young colleagues to work abroad for some time and accepting foreign trained technicians to work in Switzerland. So in 1947 a Dutch girl worked in Zurich and was able to give all the information about the training, the professional society, etc. in the Netherlands. In 1950 two Swiss girls had worked in England, one in Sweden, while in 1951/52 some worked farther afield in Africa, Egype and the United States of America. Of course before the war

exchanges had been possible, but obtaining the jobs had been the main consideration and little had been done to seek even the existence of national societies. So Elizabeth Plétscher got the addresses of the national societies and wrote to them, seeking information on training, exchange of journals and general conditions of service. Amongst other things, the Swiss heard of the triennial conferences of the U.K. society and two Swiss girls attended the next conference in London in 1952. It was from their report that the Swiss society first heard of the differences between the professions on the continent of Europe and the United Kingdom.

The very first international meeting took place in Strasbourg, France, in 1953 when some ladies from France, Germany and Switzerland had a friendly meeting. Also in 1953, Miss Pletscher made a three months trip through Canada and the United States to learn exfoliative cytology which was then in the initial stage. While studying at the laboratories of Papanicolaou in New York, Ruth Graham in Boston and Ayre in Miami, Miss Pletscher visited as many laboratories as possible as well as meeting the President of the American Society of Medical Technologists (ASMT), having already in mind her hopes of organising an international meeting in Zurich in 1954.

Opening of the First International Congress 1954 in Zurich

From 'What do you know about the IAMLT?' Published by the IAMLT, 1973

Due to the fact that in Germany laboratory technology and X-ray technology was still only one profession, the two Swiss societies of laboratory technology and of X-ray technology agreed to organise a joint congress for both professions. This congress was held in June, 1954, in Zurich with two parallel scientific programmes for laboratory technologists and X-ray technologists and a common social programme. The attendance was overwhelming and there and then a meeting of representatives of the ten nations present, namely, the United Kingdom, the Netherlands, Germany, France, Sweden, Finland, Austria, Switzerland, Canada and the United States of America agreed with Miss Pletscher's suggestion to form an International Association. The ladies most active in their support of Miss Pletscher's organisation of the event were Miss C de Jong van Beek en Donk of the Netherlands, Miss M Kleitz of France and Mrs M Oldenberg of Germany. From this point the laboratory technologists and the X-ray technologists decided to go their separate ways.

In the beginning the 'Association' was a loosely constituted body in which national presidents acted as Council members. It was hoped that a congress could be held every four years and organised by one of the member societies at its own expense. Therefore the name chosen was: INTERNATIONAL CONGRESS OF MEDICAL LABORATORY TECHNOLOGISTS (ICMLT).

The next meeting was held during the Triennial Conference of the U.K. Institute of Medical Laboratory Technology in Nottingham, England, in 1955 when a draft Constitution was considered. From the Minutes of that meeting:.....It was unanimously decided that an international organisation should be formed and that its titled should be 'INTERNATIONAL CONGRESS OF MEDICAL LABORATORY TECHNOLOGISTS' with the following aims and ideals:

> To establish and maintain communication among the societies of Medical Laboratory Technologists in the countries of the world and to promote co-operation between them, without interference with the autonomy of the constituent societies.

Miss Elizabeth Pletscher, Switzerland, (Corresponding Secretary) and Mr. J. R. Lavington, U.K. (Recording Secretary) were appointed as joint secretaries but it was decided not to appoint a Chairman, that office to be undertaken by the appointed representative of the society hosting future meetings.

There was general agreement that official memoranda should be in English with translations in French and German, and that the Minutes of the meetings should be published in the journals of all constituent bodies. Each country was asked to appoint a nominee to deal with official correspondence. As some countries had more than one organisation that catered for medical laboratory technologists it was decided that each bona fide society might be admitted to membership of the ICMLT. The immediate objectives were:

> to form a closer relationship between the constituent bodies.
> to encourage an exchange of periodicals. (It was hoped that each society would issue its publications free of charge to the other organisations).
> to enlist the support of societies in countries not already represented.

There was agreement that abstracts might be published in the journals of the other societies but that prior permission must be obtained before publishing in full. It was decided that as much information as possible be found with regard to the award of grants to those wishing to attend conferences. It was also agreed that the previous decision to hold regular Congresses be deferred for the time being as this might adversely affect those of the constituent bodies. It was hoped that the Association and individual members should support in every way the conferences conducted by its members. The hope was expressed that each organisation would be represented at the forthcoming North American Convention in Quebec, Canada, organised jointly by the Canadian and American societies and to be held in June, 1956.

This Inter-American Convention was duly held but it was not possible for all Council members (at their own expense) to attend but the event was a good opportunity for the exchange of views and information vis-a-vis European and American aspects.

Delegates met in Amersterdam in October, 1957, to discuss progress. At this meeting study groups were formed by technologists from different nations to enquire as to the situation of medical laboratory technologists throughout the world. Legal matters concerning the formation of the Association were also investigated. Questionnaires were framed and distributed to societies all over the world.

2. 1958 was a busy and momentous year. In January a bank account was established with the Swiss Credit bank ready to deal with the subscriptions which were coming in from the ten member societies. Five further societies joined later in the year and four others were showing interest. These subscriptions were on a scale agreed by the delegates at a meeting in Amsterdam the previous year. In February Miss Pletscher paid a visit to the World Health Organisation in Geneva to investigate the possibility of the Association joining the WHO. She was received by Dr. Sansonnens, Secretary of the Expert Committee on Health Laboratory Methods, who felt very confident about close co-operation being possible in the near future. This Committee had just completed an investigation into public health laboratories while the second study of hospital laboratories had been published.

The Corresponding Secretary and others had also been endeavouring to secure consultative status with the Council of Europe and to establish the principle that medical laboratory technologists should be eligible for Council of Europe Fellowships as were nurses and radiographers already. Acceptance as a non-governmental-organisation (NGO) was fairly rapid but it was feared that the other submission, although accepted, might not be considered for two years. Being accepted as a NGO proved to be the means of the Association quickly receiving some useful publicity, for later in the year the NGOs organised a meeting in Brussels with the main feature being 'The future of international organisations'. Council members Miss de Jong van Beek en Donk and Miss Kleitz attended the meeting and represented the Association.

In the September of this year the U.K. Institute of Medical Laboratory Sciences held its Conference in Bristol and many visitors from overseas attended. Here an open meeting took place to discuss ICMLT affairs, followed by two Delegates meetings. The Statutes were discussed, amendments made and the final draft made ready for distribution to the members for comment. Some discussion occurred on those study reports that had been returned, as requested at the meeting in 1957. The name of the Association was discussed and it was felt that the word Congress was inappropriate. Accordingly the present title 'International Association of Medical Laboratory Technologists - IAMLT - was adopted.

The first Council was elected and Mr. R. J. Bromfield became the first President. The Council thus consisted of:-

Mr R J Bromfield	President,	United Kingdom
Miss C de Jong van Beek en Donk	Vice-President	The Netherlands
Miss M Kleitz		France
Mrs M Oldenburg		Germany
Miss G Kastengren		Sweden
Miss E Lorenz	Treasurer,	Switzerland
Mr R J Lavington	Recording Secretary,	United Kingdom
Miss E Pletscher	Executive Secretary,	Switzerland

By the Statutes at that time the President and Vice-President or President-Elect were elected from among the Council members by the Council. The President served for two years and a further two years as Past-President when he/she retired from the Council. Both secretarial offices had to deal with much correspondence. The U.K. Institute of the recording secretary mainly compiled and issued the minutes and notices of meetings, while the Swiss executive secretary had a vast correspondence with technologists from all over the world who sought mainly advice on matters of possible employment in foreign countries. Many official national and other authorities, together with libraries, asked for our services.

In May, 1962, a 'friendly, non-official' week-end meeting, supported by French, Swiss and German members was held in Strasbourg and in June Miss Pletscher attended the second North American Conference of Medical Technologists in Washington, D.C., U.S.A.

The international meeting which was organised during the large convention did not get the publicity it deserved but helped to spread the ideal of internationalism. The Council met in Edinburgh, Scotland, in August during the Golden Jubilee Conference of the U.K. Institute of Medical Laboratory Technology. Here it was decided to issue a 'Newsletter' for distribution to all member-societies and to invite Mr Bromfield to become the Editor. The recently instituted employment scheme was proving attractive to many applicants and a fee of U.S. $5 was fixed to defray expenses. It would be difficult to guess the number of people availing themselves of this service in the first year in view of the fact that the Auditors' report for that year reads that the application fees of U.S. $5 totalled Swiss francs 554! Exchange rates for that time are not available but there must have been a lot of applicants. In the meantime the regional French society in Strasbourg had now obtained national status and was known as the 'Association Nationale du Personnel Technique Qualifié des Laboratoires d'Analyses Biologiques' with Miss M Kleitz as President and Mme N Marchal of Paris as Vice-President.

In 1963 three issues of the 'Newsletter were published from the Executive Office, one in the Spring sought the support of societies and of individuals by writing articles, items of news and notices of national meetings, the second in September deplored the fact that no one has responded to that appeal! A full programme of the Lausanne Congress was included in this issue. The third, in December, gave more up-to-date information

about accommodation, etc, about Lausanne and contained the welcome news that Council of Europe fellowships had been awarded to two medical technologists,

(a) to a member of the French society for her work on 'Titration of Blood-Gas' during studies in Switzerland and Germany.
(b) to a member of the Swiss society for studies in 'Exfoliative Cytology' made in centres in Paris, Sweden and the United Kingdom.

Information and advice were given to possible applicants for future awards and a notice was given of courses in Germany for teachers of medical technology.

The Council met in Amsterdam, the Netherlands, to prepare for the next General Assembly of Delegates in Lausanne. There were now 19 member-societies from 15 countries and the Executive Secretary was finding it necessary to engage part-time help in the increasing task of dealing with the secretarial work.

1964 was a milestone in the progress of the Association. It marked the 10th anniversary for it was now ten years since that first truly international meeting in Zurich. Membership was increasing with new societies from Malaysia, Australia, South Africa and the United States of America providing organisations seeking membership. The Canadian society was already a member. Elizabeth Pletscher, making good use of the contacts she had made with the American Society of Medical Technologists and the American publication 'LabWorld' had arranged a novel telephone hook-up with the Convention of the ASMT held concurrently in Kansas City with the Congress in Lausanne.

10 th Anniversary Congress Lausanne, Switzerland

Jubiläumskongress zum zehnjährigen Bestehen der IAMLT, Lausanne, Schweiz

10 ième anniversaire de l'IAMLT, Congrès de Lausanne, Suisse, 1964

1964 — Council members at Lausanne

Mr Guy Pascoe Miss Gerde Kastengreen Mr Reginald Bromfield

Mrs Hildegard von Morsbach deputising for Mrs M Oldenburg | Miss Elizabeth Pletscher | Miss Clementine de Jon van Beek en Donk | Miss Madelaine Kleitz | Miss Erica Lorenz

The anniversary Congress was held in the Palace de Beaulieu, Lausanne under the patronage of the Swiss National Exhibition and with the friendly co-operation of the Dean and Faculty of Medicine, University of Lausanne. The first day, Sunday, was occupied with registration and the meeting of old and new acquaintances. A feature of the day was the welcome extended to the large party of technologists and their friends from the United States of America. Monday's opening session was in the vast cinema of the Palace and the Congress was formally opened by Professor G Winckler, Vice-Dean of the Faculty of Medicine. In those days it was the custom in Europe for the President of the national host society to chair an international meeting rather than the President of the international organisation. So it was Elizabeth Pletscher as President of the Swiss society who responded to the address of welcome and kindly translated her remarks into three languages. Miss Clementine de Jong van Beek en Donk of the Netherlands was now the Association's President and in her official address gave an account of the formation and progress of the Association and hoped that the Congress, the lectures, the trade exhibition and the Swiss National exhibition itself would provide a rewarding week. A tour of the trade exhibition was followed by lunch, an afternoon of lectures and, for the Council a lengthy business meeting.

Owing to the high cost of simultaneous translation facilities it had been decided that the lecture programme should consist of a series delivered in three languages, English, French and German so that all could benefit. Tuesday morning was devoted entirely to lectures but the afternoon was free to tour the National Exhibition. The weather had been fine till then but quickly changed and those lodged near the shore of Laceman who could shelter from the torrential downpour were treated to a magnificent natural exhibition of lightning that lit up the mountains many miles away on the southern shore of the lake.

A programme of scientific films provided the educational half of Wednesday while the afternoon was spent on a boat trip around Lake Geneva where the beauty of Montreaux, the castle of Chillon and the French town of Avian les Bains contributed to a memorable day.

The day was completed by the Congress dinner at the Palace of Beaulieu where the table decorations were laboratory funnels and flasks supporting the candles illuminating the room. I wonder if anyone still has their menu card and place card holder? These were small rectangular blocks of perspex in which small pieces of laboratory items were embedded. Thursday morning was again devoted to lectures to be followed in the afternoon by the GAD. The President welcomed the delegates and, in giving an account of the progress and aims of the Association, paid tribute to the enthusiasm and hard work of Miss Pletscher during the previous ten years. She introduced the members of Council to the meeting and regretted that Mrs. Oldenburg was absent through an accident to her leg and that Mr. Lavington was absent through illness that had caused him to resign from his post of Recording Secretary. Miss Pletscher then assumed the Chair and took the delegates through the business of the meeting. The Treasurer, Miss E Lorenz, was able to show that the finances were in good shape, with a capital reserve of almost Sw. Fr. 18,000. The only regular forms of income were subscriptions from member-societies according to the established scale and the fees from the Employment Abroad scheme. However gifts from the members of Sweden and France, amounting to Sw. Fr. 1200 had been received and were gratefully acknowledged.

The U.K. society thought that the present custom whereby any society providing a Council member was obliged to pay the cost of that Council member's travelling expenses was unfair and suggested that it would be more just if these expenses were paid by the Association and that the annual subscription be increased to meet this liability. Hence the Council proposed that the subscription be increased to U.S. $40 per unit from January 1st, 1965. This proposal, having been translated into French and German, was put to the meeting and carried with only two votes cast against it.

Resignation from the Council had been received from Miss Kastengreen and from Mr. Lavington. Council proposed Mr. G C Pascoe, U.K., to replace Mr Lavington and the re-election of the other members of Council, wishing at that time not to replace Miss Kastengreen.

These proposals were duly carried and expressions of thanks made to the retiring members. Here the proceedings were interrupted by greetings from the American Society of Medical Technologists in Kansas City by means of the trans Atlantic telephone hook-up previously mentioned. This was followed by a discussion on 'Quality Control' between pathologists in Kansas City and a panel from Lausanne. A series of quick questions and answers held the attention of the meeting who were delighted with the theme, the clarity of the reception and with the technology that had made the project possible. The joint venture had been made possible through the courtesy of Messrs. Warner Chilcott.

The General Assembly was completed uneventfully with announcements of invitations for future Congresses - Berlin, 1966 and Helsinki, 1968. As the Congress officially ended, so the fine weather finished and the whole day trip to see the Jungfrau was literally a wash out. It rained from the start, it rained at the Blue Lake, it rained at Interlaken and it was only as the coaches left for the return to Lausanne that a break in the clouds gave a momentary glimpse of the mighty Jungfrau.

5. So the Congress was over - a beautiful city as the centre, a fine building as the venue, some stimulating lectures, and in all a great credit to the hosts, the Swiss Society and the organising ability of the Executive Secretary, Miss Elizabeth Pletscher.

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MEMBER SOCIETIES

Australia: Australian Institute of Medical Laboratory Scientists, P.O. Box 450, TOOWONG. Queensland 4066.

Austria: Verband der. Diplomierten Medizinisch Technischen Assistentinnen Oesterreichs, Lazarettgasse 14, Postfach 32, A-1097 Wien.

Belgium: Association Belge des Technologues de Laboratoire -Belgische Vereniging van Laboratoriumtechnologen, General Secretary, Stenenmolenstraat, 64, 2800, Mechelen.

Chile: The President/Secretary, Colegio de Tegnologos Medicos de Chile, Jose Miguel de la Barra 480, Clasificador 303, Santiago de Chile.

Denmark: Landssammenslutningen at Hospitalslaboranter, Norre Voldgade 90, 1358 Copenhagen K.

Finland: Laboratory Nurses in Finland. Laboratoriosairaanhoitajat Ssl/UPY, Toolontullinkatu 8, SF-00250 Helsinki 25.

Finland: Suomen Laboratoriohoitajayhdistys R.Y., Asemamiehenkatu 4, 00520 Helsinki 52.

Germany: Deutscher Verband Technischer Assistenten in der Medizen-EV, Holsterhauserstrasse 69, D-4300, Essen 1.

Hong Kong: Hong Kong Medical Technology Association, The Secretary, The Federation of Medical Societies of Hong Kong, 4th Floor, Duke of Windsor Building, 15, Hennessy Road, Hong Kong.

Iceland: Mainataeknafelag Isalnds, P.O. Box 89, Reykjavik.

India: All India Medical Laboratory Technologists Association, 7/96 Sahidnagar, Calcutta - 700 078.

Ireland: Medical Laboratory Technologists Association, 29 Parnell Square, Dublin 1.

Italy: Assoxiazionne Nazionale Tecnici de Laboratorio, Via Palombini 19, Casella Postale 9094, 00165 Roma Aurelio.

Japan: The Japanese Association of Medical Technologists c/o Ichigaya Hoso Bldg., 1-5, 4-chome Kudan-Kita, Cniyoda-ku, Tokyo 102.

Korea: Korean Association of Medical Technologists, 501 Choong Moo Bldg., 1-580 Yeouiedo Dong, Yeong Deung Po-Ku, Seoul, 150.

Malaysia: The Institute of Medical and Health Laboratory Technology Malaysia, c/o Institute for Medical Research, Kuala Lumpur 22 -11.

Malaysia: The Malaysian Society of Medical Laboratory Technologists c/o Faculty of Medicine, University of Malaya, Kuala Lumpur 22-11, Malaysia.

Netherlands: Vereniging van Medische Analisten, Wilhelminapark 52, 3581, NM Utrecht.

New Zealand: The New Zealand Institute of Medical Laboratory Technology Inc., Mr. B. T. Edwards, Haematology Department, Christchurch Hospital, Private Bag, Christchurch 1.

Pakistan: Association of Pakistan Medical Laboratory Technologists, 1/A/1/19 Nazmabad, Karachi.

Singapore: Association of Medical Laboratory Technicians, Singapore, Honorary Secretary, Mr. Kamarudin Ali, Medical Centre, 4-A College Road, Singapore 3.

South Africa: The Society of Medical Laboratory Technologists of South Africa, P.O. Box 32274, Braamfontein 2017.

Spain: Asociacion Espanalo de Tecnicos de Laboratorio en Analisis Clinicos, Apdo 17, 169, c/o Tortosa 6-4°E, Madrid 7.

Sri Lanka: Sri Lanka Association of Government Medical Laboratory Technologists, Medical Research Institute, P.O. Box 527, Colombo 8.

Surinam: Vereniging Medische Analisten Suriname, P.O. Box 9316, Paramaribo.

Sweden: Svenska Laboratorieassistentforeningen (SLF) Ostermalmsgatan 19, 3tr, 114 26, Stockholm.

Sweden: SSF:s Rikssektion for Laboratorie Skoterskor c/o Birgit Czar-Weidhagen, Arbetargatan 28B 112-45 Stockholm.

Switzerland: Schweizerischer Fachverband der diplomierten medizinischen Laborantinnen und Laboranten, Case postale 174 1211 Geneve 12

Taiwan: Taipei Society of Medical Technologist, Cathay General Hospital, 280 Section 4, Jen-Ai Road, Taipei.

United Kingdom: Institute of Medical Laboratory Sciences, 12 Queen Anne Street, London W1M OAU.

United States of America: American Society for Medical Technology, 330 Meadowfern Drive, Houston, Texas 77067.

West Indies: The Caribbean Association of Medical Technologists, c/o Secretary: Mrs. Leith Chung, Pathology Department, University of West Indies, Mona, Jamaica.

Zimbabwe: Association of Medical Technologists of Zimbabwe, P.O. Box 8220, Causeway, Harare.

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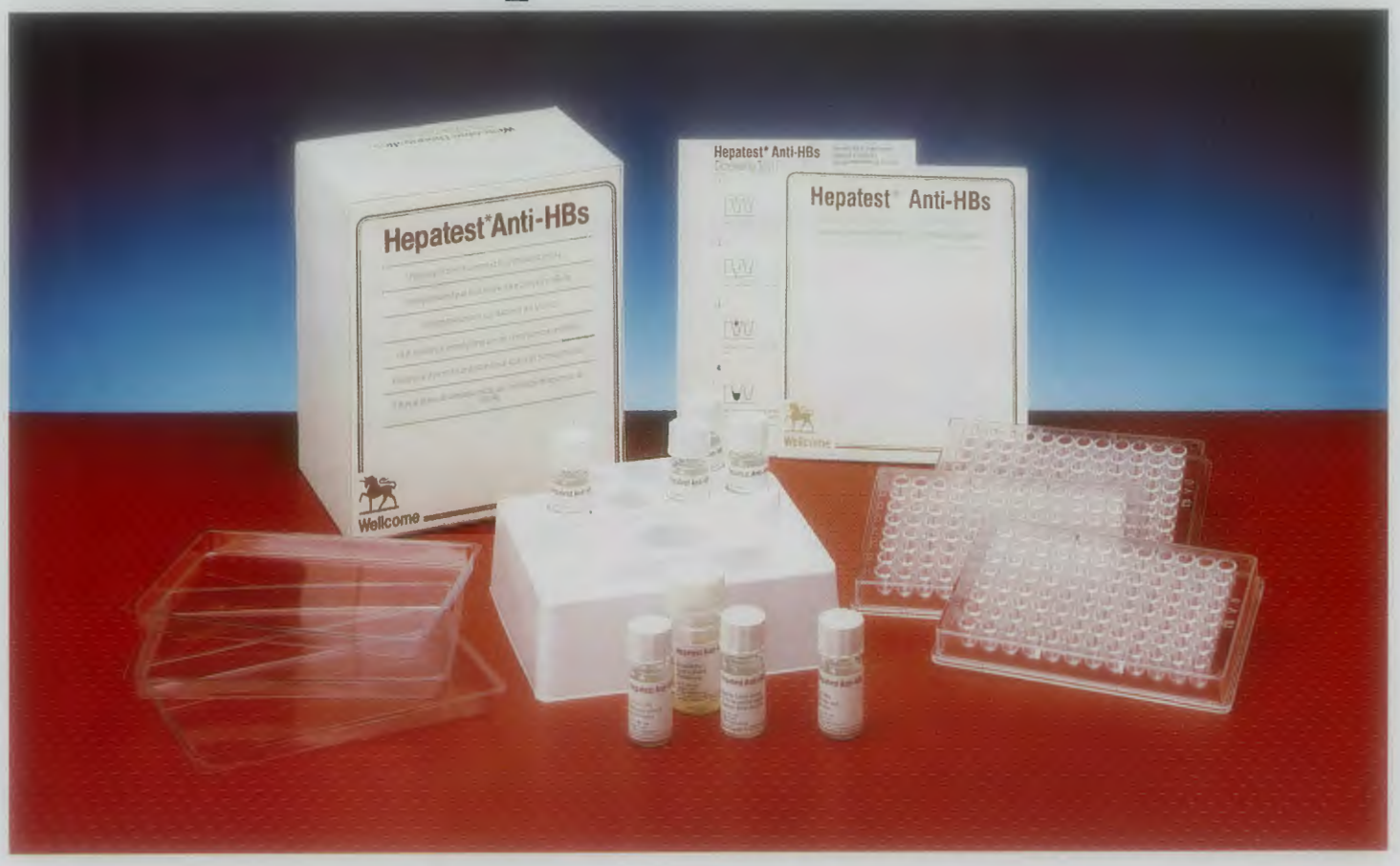

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