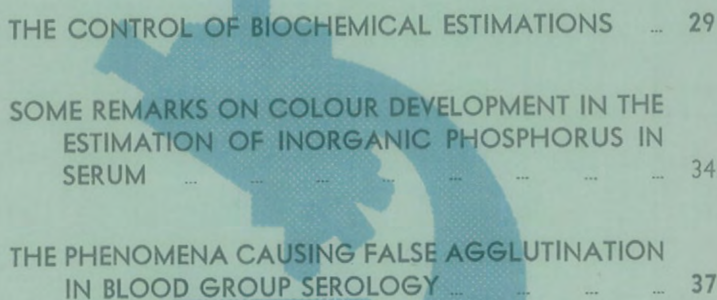
MANN

Vol. 16, No. 2 AUGUST, 1962

JOURNAL OF THE NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY

CONTENTS



THE CONTROL OF BIOCHEMICAL ESTIMATIONS ... 29

SOME REMARKS ON COLOUR DEVELOPMENT IN THE ESTIMATION OF INORGANIC PHOSPHORUS IN SERUM 34

THE PHENOMENA CAUSING FALSE AGGLUTINATION IN BLOOD GROUP SEROLOGY 37

OXOID

The advantages of **Dehydrated Culture Media** in granule or tablet form

GRANULES: Far less hygroscopic than the conventional fine powder and, consequently, can be stored almost indefinitely. 'OXOID' Culture Media are, therefore, particularly suitable for tropical use.

TABLETS: Ideal for making up small quantities of culture media. Rigorous laboratory control ensures uniformity of content.

Tablets and granules need only the addition of a fixed quantity of distilled water, drastically reducing the time and effort involved in preparing media.

RECENT ADDITIONS TO THE RANGE

CHARCOAL AGAR — LACTOSE BROTH — WHEY BROTH
PURPLE SERUM AGAR BASE — SALMONELLA SHIGELLA AGAR
TRYPTONE GLUCOSE EXTRACT AGAR — CANDIDA MEDIUM
TRYPTONE SOYA AGAR — POTATO DEXTROSE AGAR
STUARTS TRANSPORT MEDIUM

OXOID **CULTURE MEDIA**

Manufactured by Oxo Ltd., London
Sole New Zealand Agent: EDWIN A. PIPER LTD.
2 DINGLE ROAD, ST. HELIERS BAY, AUCKLAND, E.1

Biolab

Sole New Zealand Agents For:—

BALTIMORE BIOLOGICAL LABORATORIES

120 Different types of Dehydrated Culture Media

IMMEDIATELY AVAILABLE EX STOCK

B.B.L. can also produce special formulae, which are developed on request, for specific purposes.

CAPPEL LABORATORIES

determine A.S.T.O. with

STREPTOLYSIN O REAGENTS (CAPPEL)

Reagent, Buffer and Control available

IMMEDIATELY EX STOCK

Cappel Range also includes

V.D.R.L. Cardiolipin Antigen
R.P.C.F. Antigen
Kolmer-Wasserman Cardiolipin Antigen
Precipitin Sera
Heterophile Antibody Test Kitset
Positive Syphilitic Control Sera

All manuals and relevant literature available on application to:—

Biological Laboratories Limited

Woodside Avenue, NORTHCOTE

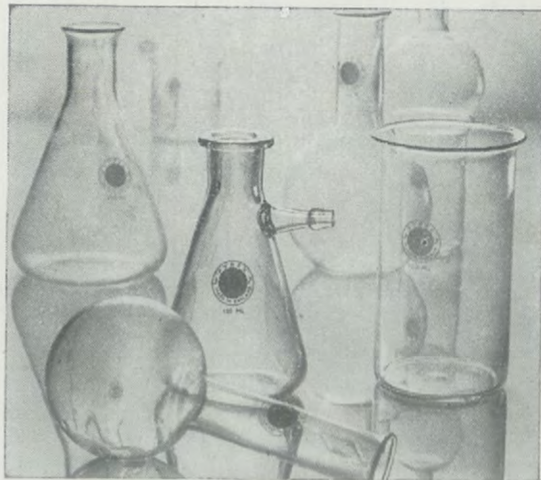
P.O. Box 2749,
AUCKLAND, C.1.

Telephones: 18-125
19-748

SCIENTIFIC GROUNDWORK IN PYREX

A machine called the Turret Chain made these: it automatically makes blownware such as flasks, beakers and other types of laboratory ware, to a very high standard of uniformity. It's the only machine of its kind in Europe. Just an example of how PYREX, the first and most important source of borosilicate glassware in this country, use the latest and best processes available. PYREX are always improving their production methods to attain even higher standards of quality. This is one good reason (among many) why everyone who is looking for quality glassware, looks for PYREX.

Pyrex beakers and flasks



are made in all practical sizes and shapes for students, routine or research work.

Extremely low expansion coefficient virtually eliminates breakage from thermal shock allows more robust construction giving greatly increased mechanical strength

High stability against attack from water and all acids (except hydrofluoric and glacial phosphoric)

Therefore durable, accurate, economical, dependable, most used.

"ENGLISH"

PYREX

Regd. Trade Mark

Laboratory and scientific glass

N.Z. Agents: **Messrs. F. O. & H. S. HART, 20 Victoria Street, Wellington, C.1**

JOURNAL OF THE NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY TECHNOLOGY

Vol. 16 No. 2 AUGUST, 1962

Editors:

Miss L. Evans, G. Rose.

Editorial Staff:

Miss G. Collyer, T. Tanner, F. Corey.

JOURNAL REPRESENTATIVES

Auckland: M. R. Dix.

Dunedin: J. D. R. Morgan.

Wellington: A. Schwass.

Communications regarding this JOURNAL should be sent to the Editor, Department of Pathology, Christchurch Public Hospital, Christchurch.

Communications primarily affecting the Institute should be addressed to the Secretary, Mr H. E. Hutchings, Pathology Department, Palmerston North Hospital.

All moneys should be paid to the Treasurer of the New Zealand Institute of Medical Laboratory Technology, Mr D. J. Philip, Pathology Department, Middlemore Hospital, Auckland.

Subscription to this JOURNAL is five shillings per year or two shillings per copy, post free.

Contributions to this JOURNAL are the opinions of the contributor and do not necessarily reflect the policy of the Institute.

ADDRESSES

If the address as printed on this envelope is incorrect, **please** notify the Editor as soon as possible of your **correct** address.

N.Z.I.M.L.T. (Dunedin Branch)

Proceedings of a meeting held on *

25th July, 1961

SHORT PAPERS AND DEMONSTRATIONS

Miss J. Oldham—The Control of Biochemical Estimations.

Mr R. Clifton—Some Remarks on Colour Development in the Estimation of Phosphorus in Serum.

Mr J. Kitto—The Principle of Electrophoresis.

Mr A. Forsyth—The Stabilisation of the Nitrogen Nessler Complex.

Mr T. Brown—Phenylketonuria.

Mr G. Tannock—Colicines.

Mr A. Gray—Bacterial Counts from Urine.

Miss J. Horton—Demonstration of L.E. Cells.

Miss R. Rusbatch—Some Interesting Blood Films.

Miss G. Bremner—Investigation of Prolonged Prothrombin Times.

Miss J. McElrea—The Phenomena causing false agglutinations in Blood Bank Serology.

Mr M. Harris—A brief comparison of Wintrobe and Westergren E.S.R. Methods.

Mr K. Fletcher—A case of Congenital non-spherocytic Haemolytic Anaemia.

A selection of the above papers are reproduced below.

* Received for publication, March, 1962.

THE CONTROL OF BIOCHEMICAL ESTIMATIONS

Miss J. Oldham

Only within recent years has the principle of laboratory control become current practice. In fact, it dates back only to 1946 when a committee of the Medical Society of the State of Pennsylvania proposed a survey to check the accuracy of some of the more common chemical measurements made in hospital laboratories throughout the state. The result of the survey was most revealing. They found that the degree of unreliability was surprising, the accuracy of the measurement was below any reasonable standard, the unsatisfactory results outnumbered the satisfactory and no laboratory was perfect.

Errors in laboratory estimations fall into two groups—those which exist in the method itself and those which are avoidable. Therefore, there will always be some small variation in the results but it is necessary to be aware of any change in the accuracy of a particular method in order to correct and to control the results. If the method proves to be inaccurate then the cause of the inaccuracy may be investigated.

First of all, the standard error is determined. This depends on a number of factors—on the degree of accuracy in the calibration of the glassware, the variations in temperature and humidity, variations in the reagents and on the time factor—this, especially when tests are being done in batches.

When the subjective error is determined this depends on the experience and reliability of the operator.

When this has been completed a practical permissible degree of variation may be decided upon. The standard error of the method together with the clinical significance of the figures are taken into account.

To find the standard error several batches of tests are done on consecutive days using the same material. At least fifty estimations should be done to give a valid answer.

FORMULAE

The arithmetic mean is found—in this case 203.4 and from this the deviation of each result.

Each of the deviations is squared and the sum of the squared deviations found. The standard error is the square root of the sum of the deviations squared divided by the number of tests minus one. 95 per cent. of all tests will fall within $\pm$ 2σ although in biological experiments $\pm$ 3σ is sometimes used. Ideally in most cases the

order of magnitude of 20 is about 5 per cent. and this is generally the limit we strive to contain our results within.

Different estimations have different degrees of latitude in regard to their clinical significance. For example, small fluctuations in cholesterol levels are not significant but small fluctuations in blood pH are highly significant.

Once the standard error is critically established the techniques of any new operator can be evaluated by working out a personal series and seeing if an acceptable deviation results.

Controls may be either commercially prepared freeze-dried serum, pooled serum or simple solutions of a known concentration.

Control serum is prepared commercially in two different ways. Versatol, for example is pooled human serum, the constituents are removed from the serum by dialysis. Because of their greater molecular size some of the protein constituents cannot be removed completely but they are reduced to a constant level. The other constituents, sodium, potassium, bilirubin, etc., are completely removed. They are then quantitatively weighed back into the serum to bring it to a known value. It is then freeze-dried to stablise these values.

The A.C.P. serum, on the other hand, is pooled human serum in which the contents have been estimated by multiple independent estimations. This is also freeze-dried.

When pooled serum is used, the contents are evaluated and the serum is kept frozen at —20°C.

Some workers believe that simple solutions of a known concentration are an adequate control.

The requirements of a good control are:—

1. Reliability of the control values of the constituents.
2. Stability on storage.
3. Physical similarity of the control material with the unknowns usually encountered. A serum control should simulate serum.
4. Chemical similarity with the unknown samples.

The commercially prepared controls fulfills all of these requirements but the simple solutions fail in the latter two. It is important that there is a physical similarity between the test and the control because other constituents of serum may provide a colour reaction which is incidental to the actual test. It is necessary then that the controls should act in the same way.

The chemical similarity, too, is important because in some estimations the proteins and liquid substances must be precipitated.

If the control contains these substances it must be treated in exactly the same way as the test and so each step in the estimation is controlled.

Some people believe that standards alone are a sufficient control. This has been proven a fallacy because they too may be affected by the wrong technique and reagents.

Recently investigations into the accuracy of our methods for the determination of blood urea and non-protein nitrogen showed that the standard deviation for the ureas was ± 7.5 per cent. The normal range of the blood urea is 15-35 mg/100 ml. so that our results fall within one or two mg. of the true result. In contrast the standard deviation for the N.P.Ns. was ± 13.7 per cent.

Last year an investigation into the Micro method for the estimation of serum phosphorus, showed that the standard deviation was ± 22 per cent. The normal range for phosphorus is 2.5 - 4.5 mgs/100 ml. For a normal phosphorus of 3.5 mgs results anywhere between 2.1 and 4.6 mgs could be obtained. Obviously the method was inaccurate.

Recently an investigation was made into the accuracy of a Micro method for the determination of calcium in serum. The standard deviation on a short series was ± 4 per cent. so that for a normal calcium of 10 mg/100 ml. we could expect to obtain results within 9.6 - 10.4 mg. This is a reasonable variation. The method was readily adopted as it has many advantages over the Micro method previously used. It can be done on 0.1 ml. of serum instead of 2.0 ml. It is also a direct titration using Cal Red indicator and so is an extremely quick method.

From these examples alone it is obvious that it is absolutely essential to control all tests performed in the laboratory to ensure that the clinicians receive results which are 100 per cent. valid, or, to be precise 95 per cent. ± 2.

SOME REMARKS ON COLOUR DEVELOPMENT IN THE ESTIMATION OF INORGANIC PHOSPHORUS IN SERUM

R. Clifton

The basis of the estimation of inorganic phosphorus in serum is the treating of a protein-free filtrate of the serum with an acid-molybdate reagent which reacts with the inorganic phosphate to form phosphomolybdic acid ($H_3PO_4.12MoO_3$).

The hexavalent molybdenum of the phosphomolybdic acid is then reduced to trivalent molybdenum, which gives a blue colour. The intensity of the colour is, under certain conditions directly proportional to the amount of inorganic phosphate present, and can be estimated colourimetrically.

Various reducing agents have been used by different workers in this field. Bell and Diosy in 1920, and Deniges in 1927, independently discovered that certain of them reduce the molybdenum of phosphomolybdic acid, while at the same time having negligible effect on the molybdenum of uncombined molybdic acid in the same solution.

Bell and Doisy added sodium carbonate after the colour had developed, apparently in order to prevent turbidity which occasionally resulted from traces of protein in the blood filtrate

Briggs in 1922 showed that if the colour was developed and read in acid solution there was much less rapid fading, and that no turbidity formed if the bood had been shaken thoroughly with trichloracetic acid to precipitate the proteins.

Benedict and Theis (1924) improved the method by heating the mixture during development of the colour, thereby greatly increasing its intensity.

Fiske and Subbarow in 1925 began using 1.2.4 aminonaptholsulphonic acid as the reducing agent. This however is time consuming to make up, and is not stable for any length of time.

Kuttner and Lichtenstein in 1930 introduced stannous chloride. This had the advantage of being much more stable than aminonaptholsulphonic acid, and of giving a deeper colour. However their method, a micro one using 0.2 ml. of serum, has been found in practice to give unreliable results.

A more recent development has been the use of ascorbic acid as the reducing agent, and this is the one we now employ in this laboratory.

The method is essentially that of King and Wootton:

0.5 ml. of serum is treated with 7 ml. of 10 per cent. trichloracetic acid. The mixture is shaken, and filtered after five minutes. Then 5 mls. of the clear filtrate is treated in parallel with 5 mls. of standard phosphate solution (= 0.02 mg.P) and 5 mls. of 10 per cent. trichloracetic acid (which is the blank) as follows:

To each add 0.4 ml. of 60 per cent. perchloric acid, 0.4 ml. of 5 per cent. ammonium molybdate, and 0.4 ml. of 0.2 per cent. ascorbic acid solution, mixing in between.

The tubes are left standing at room temperature for 15 minutes then read in the Spekker using filter 8.

The main difficulty here is that the colour intensity of the solutions change continuously with time so that careful control of the time factor is essential. Also, whereas the test colour develops relatively slowly, the standard develops within a few minutes of adding the reducing agent, and thereafter increases only very slowly. Therefore we must find the optimum time to leave the solutions before reading them in the Spekker in order that the test solutions should have sufficient time for correct colour development. It was towards this end that I recently carried out a series of investigations.

King and Wootton advocate using 0.2 ml. of the reducing agent solution, and taking the readings after fifteen minutes. However, I found from a Versatol control put up with each batch of tests that, with the ascorbic acid available to us, this gave results which were consistently 10-15 per cent. too low.

To correct this I first tried lengthening the period for colour development. I put up a series of tests with a control, standard, and blank, and took the Spekker readings of the whole batch at intervals up to 1 hour 45 minutes, and then again the next day.

On calculating the results I found that a result closest to the correct value was obtained after 45 minutes. Thereafter the result (in mgm per 100 ml. of phosphorus) continued to increase, but at a relatively slow rate. Even after the solutions had been left overnight I found that the result obtained was only 5 per cent. above the correct one.

It would seem then that the optimum time for colour development, using 0.2 ml. of the reducing agent, is at least 45 minutes. This would make the test unnecessarily time consuming.

Howitt ln 1952 advocated a coupling period of a few minutes after addition of molybdate, and I found that this effected an improvement, though not a substantial one.

I then tried the same procedure, but using twice as much ascorbic acid solution, i.e. 0.4 ml.

This, I found, gave the optimum results after only 15 minutes had been allowed for colour development.

These conditions (i.e. allowing 5 minutes for coupling, 4 ml. of reducing agent and 15 minutes for colour development) have been used for all routine serum phosphorus tests in the laboratory for the past 3 to 4 weeks, and have given consistently good results, on the basis of Versatol controls.

References:

1. "Quantitative Clinical Chemistry", Peters and Van Slyke.
2. "Micro-Analysis in Medical Biochemistry", King and Wootton, 3rd Edition.
3. "Practical Physiological Chemistry", Hawk, Oser and Summerson, 12th Edition.

THE PHENOMENA CAUSING FALSE AGGLUTINATION IN BLOOD GROUP SEROLOGY

Miss J. M. McElrea

In the course of Serology, one comes across the occurrence of false agglutination. If these are recorded as true results, then severe serological errors may arise. These false agglutinations can be minimized by the use of careful techniques, and an understanding of the facts that give rise to them.

Now I will try to illustrate some of the phenomena which will give rise to these false agglutinations.

Rouleaux formation or pseudoagglutination, as it is sometimes called, is a property of the serum which causes the red cells to stack like a pile of coins. With gross rouleaux formation, agglutination cannot be distinguished, and a method of ridding this phenomenon is by diluting the serum down with saline, and the rouleaux should disappear while the true agglutination remains. However in regards to cross matching blood, this method may dilute out a weak antibody and therefore will give no agglutination, and an indirect Coombs' test is the only sure way of ensuring a safe result. If care is not taken, and the cell suspensions are not examined microscopically, but macroscopically in the presence of gross rouleaux formation, the results may be interpreted as visual agglutination. This phenomenon is produced when a serum contains a high concentration of abnormal globulins, e.g. in case of myeloma. The rouleaux formation caused by dextran may interfere seriously with blood grouping tests; there is no serious difficulty in testing the red cells, because these can be washed free from dextran, but agglutination tests with sera containing dextran, may be impossible to interpret, because of heavy rouleaux formation. In such cases the indirect antiglobulin test must be used to detect antibodies. Various substances have some inhibiting effect on rouleaux formation (e.g. glycine and sodium salicylate), but none of these are of much practical value.

OTHER FACTORS CAUSING NON SPECIFIC CLUMPING OF RED BLOOD CELLS:

These include traces of colloidal silica, cleansing agents, and contamination with Whartons Jelly, Polyagglutination and Pan agglutination. These I mention briefly.

When solutions are auto-claved, or stored in glass bottles, they may become contaminated by colloidal silica. When traces of colloidal silica come into contact with red cells, non specific clumping occurs although this does not occur if serum is present. This

NEW ZEALAND INSTITUTE MEDICAL LABORATORY TECHNOLOGY (INC.)

MINUTES OF THE COUNCIL MEETING HELD AT WELLINGTON HOSPITAL, MAY 19th, 1962.

The meeting opened at 10.25 a.m.

Present.

Mr Olive (in chair), H. E. Hutchings, H. Bloore, Miss J. Mattingly, Miss J. O'Grady, G. Cameron, M. McL. Donnell, G. Rose, D. Phillip.

Apologies were received from J. Walker.

Minutes of previous meeting.

Moved: That the minutes of previous meeting be confirmed.

Applications as listed were received.

New Members.

Senior: Mr F. Smith, Napier; Mr D. S. Ford, Medical School, Dunedin; Mr G. McMahon, Medical School, Dunedin.

Junior: Miss J. L. Hadfield, Blenheim; Mr L. Nelson, Blenheim; Miss M. J. Sommerville, c/- Drs. Cairns and Doyle, Auckland; Miss J. M. Brooke, c/-. Drs. Cairns and Doyle, Auckland; Miss L. Hayes, c/-. Drs. Cairns and Doyle, Auckland; Miss J. M. Edgar, Medical School, Dunedin; Miss G. F. Bremner, Medical School, Dunedin; Mr L. M. Cantwell, Medical School, Dunedin; Miss L. I. Heath, Gisborne; Miss D. E. Dodd, Ashburton; Miss J. Maslen, Christchurch; Mr B. R. Rae, Christchurch; Mr D. S. CcConnell, Christchurch; Miss E. M. Burrows, Christchurch; Mr W. J. Bumstead, Christchurch; Mr J. D. Drummond, Hastings.

Resignations.

The resignation of Mr Carruthers on his retirement from Rotorua Hospital, and of Mrs Wadsworth were received.

Moved: That the Secretary write to Mr Carruthers wishing him well on his retirement from Queen Elizabeth Hospital.

Moved: That the applications be accepted and the resignations received. Donnell/O'Grady.

On receiving the report of the tragic death of Mr and Mrs Carroll, the Council stood in silence.

Moved: That the telegram and floral tribute already sent be followed by a letter of sympathy to Mr Carroll and Mr and Mrs Young.

Bloore/Mattingly.

Treasurer's Report.

That the Treasurers report be received. Philip/Donnell.

Moved: That the question of the difference in receipts for advertising in the Journal over the past two years be clarified and brought before the next Council Meeting. Donnell/Rose.

Journal Report.

The Editor reported the persistent general lack of material. The formation of branches had not brought forward the hoped for material.

Rex Aitken Prize.

It was decided that the judges remain as for 1961.

The Editor submitted the resignation of the Journal Committee to take effect at the end of 1962.

Moved: That the Journal Report be received. Mattingly/Donnell.

Correspondence.

Letter from Auckland branch pointing out that no opportunity was being given New Zealand trained technical staff to apply for advertised Medical School vacancies.

Moved: That a letter be sent to the Registrar, Otago University, expressing concern that in advertising for technical staff no allowance was made for the possible application by New Zealand trained personnel.

Donnell/Cameron.

Letter from Auckland branch concerning inaccuracies of Press Reports.

It was reported by Mr Olive that accurate information was handed to the Press Association by Miss Van de Zande, and that inaccuracies arose from there.

Letter from Miss Lattimore concerning overtime payable on a public holiday.

The Secretary was asked to reply.

REMITS.

to Conference from Christchurch, Dunedin, Auckland, Hawera, and Palmerston North.

The remits were discussed.

Moved: That the remits be received. Cameron/Mattingly.

Request for consideration of legal position of Medical Laboratory Technologists and trainees under Section 155, 156 and 157 of Crimes Act 1961 by Dunedin Branch.

Mr Olive undertook to seek further information.

A letter was received from the Treasurer giving the unfinancial members (listed hereunder). The treasurer recommended that, in accordance with Rule 10c, they be considered to have resigned. All have been notified several times.

Mr K. Ash, Clinical Lab. P.N.; Miss P. Begg, Balclutha; Mr W. Beggs, Auckland; Miss P. Blair, Auckland; Mr K. H. Boddy, Med. School, Dunedin; Miss P. D. A. Carson, Wellington; Mrs K. C. Cavaye, Tauranga; Mr M. Churchhouse, Auckland; Mr C. K. Clapson, Waikato; Mr J. S. Cole, Auckland; Miss N. R. C. Davies, Waikato; Mr N. Davy, Auckland; Miss A. Duxfield, Auckland; Mr A. Fischmann, Auckland; Mr A. D. Fisher, Auckland; Miss F. Gordon, Invercargill; Miss P. V. Harper, Auckland; Mr M. L. Harris, c/-. Dr. Perry, Dunedin; Miss M. Healy, Mater. Hosp. Auckland; Miss D. E. Hitchcock, Wellington; Mr W. Hodgson, Gisborne; Mr A. H. Howell, Waikato; Miss R. Johnson, Auckland; Mr M. V. Keenan, Waikato; Miss M. A. Kennedy, National Health Centre, Wellington; Miss J. Kirk, Masterton; Miss G. McCormack, National Women's Lab.; Miss J. McElrea, Med. School, Dunedin; Mr J. McLachlan, Auckland; Miss G. S. Mair, Christchurch; Mr G. Moyle, Wallaceville; Miss R. Oldham, Waikato; Miss R. Paine, Gisborne; Mrs S. D. Paviour, Auckland; Mr G. Pearmain, Whakatane; Miss B. Rawle, Auckland; Mr F. Robinson, Auckland; Mr P. Saville, Christchurch; Mr D. C. Smith, Tauranga; Miss B. Soljak, Auckland;

Mr C. Stenbeck, Auckland; Mr G. W. Tisch, Dr. Stewart's Lab., Lower Hutt; Miss A. Turner, Waikato; Mr J. Webb, Auckland; Miss L. Wills, Wellington; Mr R. Wilson, 102 Helensburgh Road, Dunedin.

Moved: That inward correspondence be received and that outward correspondence be approved. Bloore/Philip.

General Business.

Mr Olive reported that the information received regarding submissions to Salaries Advisory Committee was nil.

Moved: That the Secretary write to the Minister of Health, indicating that according to Hospital Employment Regulations, Clause 6, para. 2(d) two other persons not being Laboratory workers employed by Hospital Boards, are required to comprise the full Salaries Advisory Committee. The Secretary was to indicate that it had come to the attention of the Council that Dr. Mercer is on Sabbatical leave overseas. If it would assist the Honourable Minister in preserving stability of the Committee, the Secretary was to offer on behalf of the Institute, a replacement in his stead.

Philip/Cameron.

It was reported to the Council that the Hospital Laboratory Advisory Committee was to meet within the next week or two. They were expected to discuss the reports, from examiners, on the recent C.O.P. and Intermediate Examinations and on the recommendations of these reports, report to the Director General of Health.

The Joint Committee of the Society of Pathologists and Institute of Medical Technology was expected to meet early in June.

Moved: That the expenses to the current meeting be paid.

Olive/Mattingly.

The meeting closed at 4.00 p.m.

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

HELD IN AUCKLAND, JULY 11th, 1962.

The meeting opened at 2.30 p.m.

Present:

Mr Olive (in the chair), Messrs Phillip, Bloore, Donnell, Cameron, Hutchings and Miss O'Grady. Mr Bilkey attended for a short while by invitation.

Apologies were received from Mr Walker, Mr Rose and Miss Mattingly.

Minutes of the previous meeting.

The question of the difference in receipts for advertising in the Journal. A report from the Editorial committee states that the receipts have been investigated and the money is forthcoming.

The legal position of a Medical Technologist in the instance of error. The matter has been referred to the Hospital Boards Association and their solicitors for their Ruling.

Unfinancial members.

Moved: That those members who have paid arrears and current subscription be re-elected. Bloore/Philip.

Moved: That the minutes be confirmed. Cameron/Donnell.

Applications and resignations.

The following applications for membership were received.

Senior members: Mr H. M. Bilkey, Auckland; Miss V. M. Toms, Wellington; Mr W. Hodgson, Dunedin; Mr D. Cathcart, Invercargill; Mr L. R. Taylor, Oamaru; Mr R. J. Patterson, Auckland; Miss J. M. McKenzie, Auckland.

Junior members: Miss B. E. Markin, Auckland; Miss L. M. Robbie, Balclutha; Miss M. G. Carman, Wellington; Miss A. Southern, Wellington; Miss P. Maddocks, Wellington; Miss G. Shooter, Wellington; Mr J. D. Nealie, Auckland; Miss B. J. Burroughs, Auckland; Mr R. J. MacDonald, Auckland; Mr C. J. Sorenson, Auckland; Miss H. Smyth, Auckland; Mr R. D. Boyle, Waipukurau; Miss E. H. Tripp, Wellington; Miss B. N. Gamblin, Hawera; Miss M. Gooch, Tauranga; Mr D. C. Quinnell, Tauranga; Mr C. E. Glover, Tauranga; Miss M. J. Hall, Hamilton; Miss D. Lawton, Hamilton; Miss G. E. Evison, Hamilton; Miss K. D. Long, Hamilton; Mr E. B. Alexander, Hamilton; Miss L. Eccersall, Hamilton; Mr G. S. Gilbert, New Plymouth; Mr V. Parrish, Auckland; Miss Y. M. Cleverley, Oamaru; Miss J. Monteath, Oamaru; Mr P. L. Carthew, Plm. North; Mr J. McKay, Plm. North.

Resignations were received from.

Mrs J. Pettit (nee McElrea), Dunedin; J. M. Taylor, New Plymouth; L. Wright, Hawera; H. F. Pilkington, Hikurangi; P. Begg, Dunedin.

Moved: That the applications be accepted and the resignations be received. Cameron/Philip.

The Treasurer's Report was tabled.

Further to the report £330 had been received since April for subscriptions.

Further expenses as—

£63 6 0 for Journal advertising.
£ 2 16 0 as a donation.
£57 19 9 for Council meeting.
£ 4 12 6 as postage.
£72 13 1 Journal expenses.
£10 0 0 General expenses.
£24 13 8 Stationery.

The present Bank Balance stood at £439.

Moved: That the Treasurers report be received. Philip/Bloore.

Editor's Report.

Reported no material other than the Council minutes for the next Journal. The report for the Conference was tabled.

Moved: That the Editors report be received. Philip/Cameron.

Correspondence.

Moved: That the inward correspondence be received and outward correspondence be approved. Donnell/Bloore

The Chairman indicated that he had received complaints of the voting paper. Information from a City Scrutineer had shown that by a polling Act, nominees should be in alphabetical order.

The instructions, the Chairman had been told, were misleading. The Council decided to recommend to the Conference that another ballot be held.

Moved: That expense to this Council meeting be paid.

Donnell/Cameron.

The meeting closed at 5.00 p.m.

DEPARTMENT OF HEALTH
INTERMEDIATE EXAMINATION FOR HOSPITAL LABORATORY TRAINEES

Wednesday, 11th April, 1962.

9.30 a.m. — 11.30 a.m.

HAEMATOLOGY, BLOOD BANK, TECHNIQUE AND BACTERIOLOGY

Written Paper I

Time allowed: 2 hours. Answer all questions.

1. List the methods used in sterilisation, giving a short commentary on the basic principles involved, and a *brief* description of the appropriate equipment used in each method.
2. Describe how you would isolate, and make the exact identification of an Enterococcus from a urine.
3. Construct a table showing the interaction of cells and serum in the ABO groups.
   How are the appropriate reagents prepared and stored?
   What do you understand by the term Rh.
4. Write note on:—
   (a) The haematocrit.
   (b) The calculation of the platelet count.
   (c) Leishman stain.
   (d) Monocytes.
   (e) The spreading of blood films for differential counts.

Wednesday, 11th April, 1962

2.30 — 4.30 p.m.

BIOCHEMISTRY AND GENERAL

Written Paper II

Time allowed: 2 hours Answer all questions.

1. Discuss the blood anticoagulants you know. What are their specific uses, advantages, disadvantages and mode of action.

2. Describe a method for the estimation of C.S.F. chloride, giving an outline of the associated theory. Give an example of an imaginary titration and show how this would be worked out to give a final answer.
3. Using diagrams to illustrate your answer, explain either:—
   (a) How a constant temperature waterbath maintains its temperature.
   OR (b) How a constant temperature incubator maintains its temperature.
4. Describe in detail a method for the estimation of urea in urine, giving the theory upon which the method is based, and the preparation of the reagents.

Friday, 27th April, 1962

9 a.m. — 12 noon

PRACTICAL EXAMINATION

Do all questions. Wherever possible illustrate your answers by rough diagrams. Wherever working is required, show this in your answer.

Ten minutes are allowed for each question.

GROUP A.

1. Identify as far as possible this gram negative, motile organism which has been isolated from faeces, from the cultures, etc. supplied. (Salmonella; showing typical biochemical reactions.)
   Draw out your scheme for the isolation of intestinal pathogenic organisms.
2. Give the probable indentification of the organisms in slides A, B and C.
   (A) Corynebacteria, (B) Neisseria, (C) Streptococci.
3. Identify the given organism. Do you know any further method for the separation of apparently identical organisms in this group?
   (Staphylococcus aureus).
4. What is this piece of apparatus. Draw a diagram to illustrate its mode of action and note any further equipment which would be required to carry out an investigation with it.
   (Dark ground condenser).
5. What is this? How and why is it used? What precautions must be taken to avoid contamination of the product?
   (Seitz filter).
6. What are these and how are they prepared, used and stored?
   (Antibiotic patches).

GROUP B.

7. Identify the ten labelled parts of the microscope provided, giving a brief note as to the purpose of each.
8. Draw a diagram illustrating the use of the ruled areas of a counting chamber in counting red and white cells in a routine blood count. Show the important dimensions.
9. Comment on the abnormality, if any, which you find in the three slides, D, E and F provided. Make brief notes on your findings.
   (D) Normal film, (E) Polychromasia, (F) Chronic myeloid leukaemia.

10. The haematocrit tube provided has been properly centrifuged to pack the red cells. It was prepared from blood with .... grams of haemoglobin per 100 ml. What is the MCHC? Show your working.
11. Prepare three Pasteur pipettes from the glass supplied. What further preparation of the pipettes is required before use?
12. Discuss the packing of the sample provided. Illustrate your answer by quoting the Postal Regulations.

GROUP C.

13. Estimate the normality of the alkali supplied. The burette contains normal hydrochloric acid. Show your workings.
14. Test the urine supplied for specific gravity, acetone and qualitative albumin.
15. What is the meaning of the lettering on the pipette supplied? How would you check the accuracy of this pipette? (Grade "B" Delivery).
16. Perform an examination for occult blood on this faeces.
17. In a colorimeter, if a TNPN standard of 30 mg/100 ml. matches an unknown TNPN when the standard is set at 32 mm and the unknown is set at 20 mm, what is the concentration of TNPN in the unknown in mg/100 ml.
18. What are the components of the following solutions and what purpose does each serve in the solution?
    (a) Benedict's quantitative solution.
    (b) Reticulocyte fluid.
    (c) McConkey medium.

The following candidates were successful in passing the above examination which was held on 11th and 27th April, 1962:

Miss F. Atkinson, Auckland.
Miss E. M. Barry, Auckland.
Miss A. M. Duxfield, Auckland.
Miss J. B. Gane, Auckland.
Miss B. M. Johnson, Auckland.
Miss R. P. Johnson, Auckland.
Miss M. P. Keith, Auckland.
Mr J. H. McLachlan, Auckland.
Miss C. D. Macedo, Auckland.
Miss J. Sentance, Auckland.
Mr P. O. McLaughlin, Rotorua.
Mr L. J. Bardsley, Wellington.
Miss J. G. Garner, Lower Hutt.
Miss L. R. Martin, Lower Hutt.
Miss B. H. O'Reilly, Lower Hutt.
Miss A. M. Buchanan, New Plymouth.
Mr R. E. Olsen, New Plymouth.
Mr J. D. Drummond, Napier.
Miss J. M. P. Wood, Napier.
Miss L. A. Monks, Wanganui.

Miss L. Wright, Hawera.
Miss J. G. Allum, Dunedin.
Miss K. Fissenden, Dunedin.
Mr J. B. Kitton, Dunedin.
Miss R. L. Rusbatch, Dunedin.
Miss E. A. Mackay, Christchurch.
Mr C. W. Cameron, Christchurch.
Mr A. R. Coates, Christchurch.
Mr I. A. Campbell, Invercargill.
Mr W. D. Ogle, Invercargill.

NORTHLAND HOSPITAL BOARD

BACTERIOLOGISTS

Applications are invited from qualified Bacteriologists for the following positions:—

CHARGE BACTERIOLOGIST — DARGAVILLE HOSPITAL:

This is a sole charge position in a modern laboratory. A new flat is available at a reasonable rental.

STAFF BACTERIOLOGISTS (2) — WHANGAREI BASE HOSPITAL:

Two positions are available for qualified Bacteriologists, one to be primarily in charge of Haematology Department and one for the Biochemistry Department. A new laboratory has been opened in the new Main Block. The laboratory has a technical staff of nine.

Salaries are in accordance with Hospital Employment (Laboratory Workers) Regulations 1957. Further details can be obtained from the Pathologist, Whangarei Base Hospital.

Apply in writing to:—

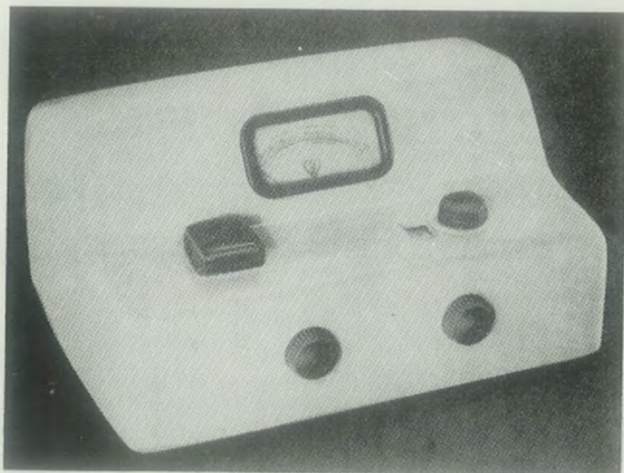
A. G. WILSON,
Secretary,
Northland Hospital Board,
P.O. Box 742,
WHANGAREI.

THE ALL-NEW BAUSCH & LOMB

SPECTRONIC 20

The World's first transistor regulated

COLORIMETER



* A lamp-monitor photo tube and feedback system cancels out even the most severe voltage fluctuations.
* Extended range 340-950 Mu. with Infra Red photo tube and filter.
* Fast warm-up time — only 2 minutes.
* Built-in blower cools sample compartment — assures rapid stability.

WATSON VICTOR
LIMITED

Auckland	Wellington	Christchurch	Dunedin
Phone 31-710	Phone 42-095	Phone 42-573	Phone 76-010

Geo. W. Wilton & Co. Ltd.

156 Willis Street
WELLINGTON

63 Shortland Street
AUCKLAND

Established 1905

Representing the leading suppliers of Scientific apparatus, glassware, and laboratory chemicals, including:—

COOKE, TROUGHTON & SIMMS Microscopes

DIFCO Culture Media

EDWARDS High Vacuum Equipment

ELECTROTHERMAL Heating Appliances

ELGASTAT Water Deionisers

GALLENKAMP Ovens, Incubators, Etc.

INTERNATIONAL Centrifuges

JOHNSON MATTHEY Platinum Apparatus

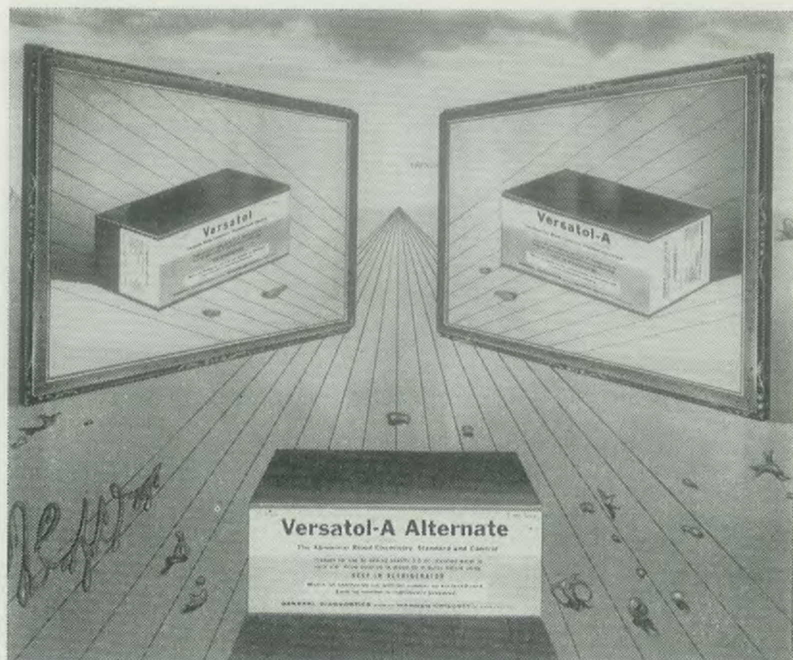
L. LIGHT & CO. Organic Chemicals

PYREX Glassware

UNICAM Absorptiometers, Spectrophotometers

WHATMAN Filter Papers

Large Stocks available — Prompt and economical Indent Service



Reflections of a Blood Chemistry Standard

To reflect without distortion chemical changes in the patient, a new standard-in-serum is now available to extend the range of the Versatol series.

VERSATOL-A ALTERNATE, the new product for the quality clinical laboratory, has each of 16 constituents standardised in the abnormal range.

VERSATOL-A ALTERNATE, is essentially a mirror image of Versatol-A. VERSATOL-A ALTERNATE provides blood chemistry values constructed for clinically significant pathological areas different from those in VERSATOL-A.

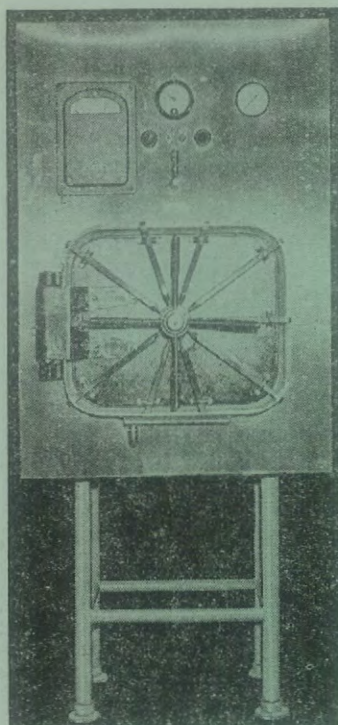
For example, the PBI in Versatol-A is abnormally low, the area which so often proves troublesome. In VERSATOL-A ALTERNATE the PBI is abnormally high — because so many have asked for an abnormally high reference point to use in calibration — and, of course, as a control for elevated PBI specimens.

Of course, Versatol is the ideal *normal* serum standard and control. All three standards derive from a human serum base — with specific constituents selectively dialyzed out — or reduced to a constant level. Their known absolute values are actual weigh-in values, as is true of any primary standard. Remember: In the Versatol series you have the *quality* standard and control serum products at *routine* control prices.

The three products in the Versatol series are currently available, as are other Warner-Chilcott diagnostic reagents. Full details and prices of the complete range will be sent to you, on request to the N.Z. Agents:

William R. WARNER & Co. Ltd.,

P.O. Box 430, Auckland.



MERCER
Bacteriological Autoclave

(Rectangular Type)

These rectangular single jacketted units are ideal for Bacteriological work in that all Chamber space is working space. Type illustrated is fitted with Flush Panel mounting adjustable thermometer and adjustable timer . . . both being integrated to permit presetting by means of keys of both temperature and time, taking guesswork out of all types of media sterilising.
Any temperature may be selected up to the equivalent of 30lbs. pressure for any length of time required up to 60 minutes. Push button control, two light stage indicator.

CRAFTSMEN
Mercer
IN METALS

J. Mercer & Sons Ltd., Christchurch, Head Office: Moorhouse Avenue. Phone 69-679. Auckland, 36 Carr Road, Mt. Roskill. Phone 558-054 (3 Lines). Wellington, 10 Vivian Street. Phone 50-400 or 53-047. Otago and Southland, Home Heating Supplies Co. Ltd., 17 St. Andrew Street. Dunedin. Phone 70-052.

K.P. SILICONE BARRIER CREAM 555

Silicones have wide applications to pharmaceutical products, and on account of their extreme water repellent properties they can be usefully employed in Barrier Creams.

Silicones are non-sensitizing and non-irritating. They have been shown not to have immediate or delayed reactions on skin contact. They possess no therapeutic value. They remain stable under varying degrees of heat. Some are soluble in alcohol; all are repellent to water and solutions of water containing sensitizing or irritant substances.

K. P. Silicone Barrier Cream 555 is recommended for use by those whose occupation brings them into contact with Detergent Solution, Electroplating Solutions, Aqueous Solutions of Acids and Alkalis, and other skin irritants.

It should not be used to enclose areas of skin which are already inflamed.

K. P. Silicone Barrier Cream 555 should be applied after the skin is thoroughly washed and dried. The cream is then carefully worked into the skin, taking care to see that the surface is completely covered, particularly between the fingers and under the fingernails.

As it is not necessary to remove the cream, subsequent applications provide a protective film.

If removal is desired, it can be accomplished by the application of surgical spirit or frequent washings with hot water and soap.

K. P. Silicone Barrier Cream is available in 4oz. and 16oz. Jars.

Kempthorne, Prosser & Co.'s
N.Z. Drug Co. Ltd.

PHARMACEUTICAL LABORATORIES

22-26 STAFFORD STREET, DUNEDIN

Warehouses at
AUCKLAND, WELLINGTON, CHRISTCHURCH and DUNEDIN

Branches at
HASTINGS, NEW PLYMOUTH, WANGANUI, PALMERSTON NORTH, INVERCARGILL and HAMILTON

Printed by Simpson & Williams Ltd., 169 St. Asaph Street, Christchurch.

40374