THE NEW ZEALAND JOURNAL OF MEDICAL LABORATORY TECHNOLOGY

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

VOLUME 17. No. 2 JULY, 1963

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In the interests of uniformity, the following directions should be followed by all contributors to the Journal.

Manuscripts should be typewritten on one side only, of good quality quarto sized paper, be double spaced and with a 1½in margin. They should bear the author's name (male authors give initials, female authors one given name), address, and (if this is different), the address of the laboratory where the work was carried out. The manuscript should take the following form: Introduction; materials and methods; results; discussion and conclusion; summary; acknowledgments; references. Carbon copies are not acceptable. Nothing should be underlined unless it is necessary that it be printed in italics.

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VOLUME 17. No. 2. JULY, 1963.

The Journal is published thrice yearly (in April, July and October) and is distributed without charge to all financial members of the N.Z.I.M.L.T. (Inc.). Subscription to the Journal for non-members is ten shillings per year or four shillings per single issue postage paid.

Communications primarily concerning the Institute should be addressed to the Secretary.

Intending contributors to the Journal should address their communications to the Editor at the Department of Pathology, Medical School, Dunedin. Copy must be in the hands of the Journal Committee by not later than the first of the month preceding the month of publication.

Enquiries regarding advertising rates should be addressed to the Advertising Manager at the Microbiology Department, Medical School, Dunedin.

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

On Improvements In Status

It seems that, in the not-too-distant future, a Registration Board may be established to look after the interests of medical laboratory technologists in New Zealand. The multiple functions of this Board will include the arrangement and conduct of the examinations, the conferment of diplomas, the maintenance of a register of qualified technologists and so on. It will replace the present Examination Board and will also take over the functions of other advisory committees. The chief benefit will be an enhancement of the standing of our profession, and on that ground we should welcome the proposal. However, before taking any irrevocable steps, it would be well to consider whether the same benefit could not be achieved by means which would be less likely to prove too inflexible and to rob us of any hopes of attaining autonomy.

A careful examination of the memorandum reproduced in this issue of the Journal, will acquaint members with the alternatives and their various advantages and disadvantages.

It is clear that an application for a Royal Charter would be a waste of time; it would not be granted. We must consider the relative merits of the two forms which an Act of Parliament may take if we are to make any real progress.

The proposal from the Director-General of Health is along the lines of the first form. It has been suggested that the Registration Board should consist of: The Director-General, four representatives of the N.Z.I.M.L.T. and three representatives of the N.Z. Society of Pathologists. Such a Board would be satisfactory for controlling the affairs of the profession, would give it recognisable status; provide a system of registration, of qualification, of training and of discipline. It would provide for our representation, but would *not* create the Institute as the sole director of the affairs of the profession. With three representatives, the Society of Pathologists would be generously represented compared with those associated with other medical ancillary professions. One such representative is more usual, yet the Society of Pathologists is dissatisfied with three. No one would wish to deny the Society the right to an adequate voice in the affairs of our profession, but we must ask ourselves if it would not be more equitable all round, and certainly of greater benefit to our prestige, if we attempted to secure an Act of Parliament such as that governing the activities of the pharmacists.

This is a matter which can only be decided after a careful consideration of the facts. At Council's direction, the memorandum on the opposite page, is reproduced for study and discussion.

Memorandum

The courses open to the Institute are as follows:—

We may seek a Royal Charter incorporating the Institute and embodying it with the constitution and powers included in the application for the grant of a Charter.

Such an application would involve much time and would be most unlikely to succeed.

The alternative is to promote an Act of Parliament by which either:—

(a) *A Registration Board is set up, at which the Institute is represented, to govern the affairs of medical laboratory technologists.*

(b) *The Institute is incorporated to govern on its own account, the affairs of medical laboratory technologists in New Zealand.*

Numerous bodies have taken one of these two courses.

Examples of those in the first group are seen in the Acts governing the following professions: The Medical Practitioners Act (1950), Physiotherapy Act (1949), Nurses and Midwives Act (1945), Dieticians Act (1950) and the Opticians Act (1928).

In the case of each of these professions, a Board or Council has been set up, consisting of: The Director General of Health (who often acts as Registrar of members of the profession); a representative from the University Faculty connected with the profession; certain nominees of the incorporated organisation (in this case, the N.Z.I.M.L.T.); other members of the profession; and someone from the Medical profession associated with the profession which is the subject of the Act. Some are members of the Board *ex officio*, some elected, others nominated by the Governor-General on the recommendation of the Minister.

The functions of the Board include:—

(a) To determine courses of training and instruction to be undertaken by candidates for examination.

(b) To approve hospitals and other places at which the whole or part of the training may be carried out.

(c) To conduct examinations and issue certificates or diplomas.

(d) To receive applications for registration from members and to authorise registration.

(e) Generally to administer the affairs of the profession.

The question of registration is regarded with much importance in these Acts. It is effected with the Registrar and is made only upon the direction of the Council or Board. Such direction will be given upon certain terms and conditions: namely, where the applicant has certain qualifications and training in New Zealand, or such overseas qualifications and training as are acceptable to the Council or Board. Training and examination requirements receive considerable attention, either in the Act, or in regulations made pursuant to the Act. In this regard, courses are arranged either by the Board on its own account, or by the Board in conjunction with a University body. Upon registration, Certificates of Registration are issued, and there may be provision for advertising or making public the Register. In some Acts, provision is made that hospitals and institutions may fill positions only from among duly registered members of the profession. The Register will allow for the entering of additional diplomas, and may be amended in various ways for various reasons (for example, changes of address). Penalties are prescribed for fraudulent procurement of registration.

In most cases, disciplinary powers in respect of the conduct of registered members is also vested in the Board, which may by way of penalty, suspend

an individual's registration for a period, or remove his name from the Register permanently. Where there are such disciplinary powers, there is also machinery for appeal against decisions of the Board relating to disciplinary matters.

Further provisions also cover questions of annual practising certificates, fees, offences by unregistered persons, the making of regulations, etc.

Regarding the second group, namely those in which the body is empowered to govern, on its own account the affairs of the profession, reference is made to the following Acts:— The New Zealand Institute of Architects (1913), The Pharmacy Act (1939) and The Accountants Act (1958).

In the cases of these professions, the Body is incorporated by Act of Parliament and constituted a body corporate with perpetual succession, having a common seal, with power to sue and be sued, to hold real and personal property, and to do and suffer all that bodies corporate may do and suffer. Such organisations consist of the registered members and are governed by a Council or Board set up from the registered members. The Council or Board will be elected normally on the basis of district representation, and some members may be nominated, or may require to be nominated, by the Governor-General.

The type of constitution, the functions, scope and powers of the institute will be very much in the hands of the body proposing itself for incorporation under Act of Parliament. The most recent Act covering such a body is the Accountants Act (1958), which sets out the constitution of the New Zealand Society of Accountants, establishes a Council of the Society, outlines the procedure to be followed by Council in governing the affairs of the Society, defines the powers of the Society including its power to make rules on certain matters. The Act also outlines the qualifications required for membership of the Society and provides a system of provisional membership for those qualified but lacking the requisite period of practical training; it gives wide scope for the conduct of examinations and the power to conduct them through a University; also provides for registration of members, establishes a Disciplinary Committee, lays down a procedure for appeals against decisions of this committee, applies restrictions on the employment of certain persons, and provides for the issuing of practising certificates.

Under the Act there is a set of rules which, to be effective, require the approval of the Governor-General in Council. These rules fill out the detail in matters of procedure and committees, the classes of members, disciplinary procedure, the establishment of an Education Committee (with details of examination requirements and the arrangement of courses, conduct of examinations and other practical matters). The Society also issues, through its Education Committee, a syllabus defining the scope of study and examination for qualification.

Such an Act would make the New Zealand Institute of Medical Laboratory Technology the directing body, with sole charge and control of the affairs of its members.

Once the Institute has decided which of the three courses it wishes to adopt, the procedure would require the approach of a Member of Parliament to introduce a Bill, or to attend to the application for a Charter.

Since it seems likely that the matter will almost certainly be dealt with by Act of Parliament, then the mode of approach should be through the Department of Health, the Institute lodging a draft or memorandum of its desires with the Department. After discussion and agreement on

the terms, a definitive Bill would be prepared by the Law Drafting Office, then the Department would attend to its presentation.

In the event of approaching and proceeding through the Department of Health costs would be minimal, being confined to any preliminary legal costs in preparing a suitable draft for submission.

Report on the Presentation of Fourth Year Trainees' Theses in Auckland

An integral part of the training programme for medical laboratory technologists in Auckland, is the execution during their fourth year of training, of some original work. The subjects selected are of the trainees' own choice.

During the year ended April 1963, ten trainees completed their theses, and these were presented in the Medical Centre, Auckland Hospital, on Thursday evening, May 16, before an assembly of some fifty to sixty people. Those present included the Director of Laboratory Services, Dr S. Williams, Pathologists, Graded Officers and Staff Medical Technologists.

Following an introduction by Dr Williams, trainees each gave a five minute summary of their thesis, followed by a five minute question period.

The following is a list of theses presented:—

1. *The Domain Ponds — A Bacteriological Survey.* Miss J. Harding.

2. *Lithium Sequestrene as a Routine Anticoagulant in Routine Biochemistry.* Miss J. Sentance.

3. *A Study of the Blood Glucose Estimation when Standardised Errors are Introduced.* Miss J. McLachlan.

4. *The Assay of Anti-haemophilic Globulin (Factor VIII).* Miss M. Keith.

5. *An Investigation of a Method of Thromboplastin Generation Screen Test and Prothrombin Time Using Capillary Blood.* Mr J. McLachlan.

6. *Biochemical Estimations of Fibrinogen.* Miss F. Kearney.

7. *An Investigation of the Urea Method.* Miss C. Macedo.

8. *A Rapid Identification of Candida albicans by Filamentation in Serum.* Miss P. Joy.

9. *A Study of the Cooke Count and the White Cell Count, both Total and Differential, in Pregnancy.* Miss A. Duxfield.

10. *A Study of the Serum Albumin Determination using the Anionic Dye Methyl Orange.* Miss R. Johnston.

The participants are to be congratulated on the completion of some interesting and informative work, and on the excellent manner in which they presented their theses.

The Director of Laboratory Services' Prize for the best thesis, was awarded to Mr J. McLachlan of the Princess Mary Laboratory, and was presented by the Director at the conclusion.

The highly successful evening closed with a supper which was very generously provided by Dr Williams.

R.T.K.

The Use of an Electroprecipitin Test for Thyroid Antibodies in Serum

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Central Laboratory, Auckland Hospital.
(Received for publication February 1963)

Introduction

Present tests for the detection of thyroid antibodies in serum include Complement Fixation, Tanned Red Cell Agglutination, Latex Particle Agglutination, Agar Gel Precipitation, Bentonite Particle Flocculation and Fluorescent Microscopy.

Routine testing of sera has been done in this laboratory for several years using agar gel precipitation and complement fixation tests. (Fischman, unpublished data).

Recently a new technique was described by Watson (1960)[10], using electroprecipitation on filter paper with normal electrophoretic equipment. This has been successfully adopted by this laboratory, and the method and results are described.

An antigen is caused to overtake the gamma- and beta-globulin fractions of the patient's serum. A precipitation line which is formed at the place where the antigen and antibody fractions meet, can be observed when the protein patterns are stained.

Method

Materials

(i) Patient's serum free from haemolysis.

(ii) Stock thyroid extract.

Wash off excess blood from human thyroid gland freshly removed and store at —20°C. Cut fine shavings and homogenise in a blender with saline in the proportion of 4 volumes of saline to 1 volume of shavings. Centrifuge homogenate for 10 minutes at 3,000 r.p.m. Store supernatant in small quantities at —20°C.

(iii) Dilute thyroid extract.

Dilute stock 1:20 in saline (v/v).

There should be insufficient haematins and albumins to be detected by electrophoresis. Keep this extract at 4°C and discard as soon as a slight precipitate appears. (In my experience this has been at least four months).

Apparatus

Spinco Model R Paper Electrophoresis Cell with a Spinco Duostat Regulated D.C. Power Supply.

Paper strips: 3cm. chromatography paper.

Sample: 0.006ml.-0.008ml. of serum.

Power Supply: 3.5 ma. per cell.

(Note: The cell is equipped with the full number of paper strips even though only one or two may be used).

Oven: Preheated to 120°-130°C.

Stain: Bromophenol Blue.

Rinsing Solutions: Rinse I 5% glacial acetic acid in distilled water.
Rinse II 5% glacial acetic acid in distilled water.
Rinse III 0.5% glacial acetic acid in distilled water.

Procedure

In general this is as given for each type of cell used. Immediately after application of the serum sample, apply an equal amount of diluted thyroid antigen approximately 5cm. on the negative electrode side of the serum sample*, then turn on the current.

After 16 hours (overnight) turn off the current and remove the paper strips for drying and staining.

(i) Dry strips in preheated oven for 30 minutes.
(ii) Transfer to staining vessel and immerse in stain for 30 minutes.
(iii) Rinse I—5 minutes.
Rinse II—5 minutes.
Rinse III—5 minutes.
(iv) Allow to dry by suspending at room temperature.

Results:

Recently a series of 28 sera has been tested for thyroid antibodies by three tests simultaneously: Complement fixation, Latex slide agglutination and Electroprecipitin techniques. Of these, 8 sera gave positive results in one or more of the tests. The remaining 20 agreed, with negative results in all tests. The results of the 8 positives can be seen in Table I.

Sera G1 and G2 are the same person, specimen 2 having been taken off two months after the removal of the thyroid gland. Serum H was the positive control supplied with the Hyland Laboratories kitset for Latex slide agglutination. This proved to be an unreliable control for the electroprecipitin test as its positivity could not always be reproduced.

Figure 1 shows the type of results which can be expected

**The exact spacing of these fluids and length of time for the run depends somewhat on the make of equipment used. The antigen contains thyroglobulin which runs with the speed of an alpha$_1$ globulin and it is necessary for this solution to have traversed the gamma globulin and then the beta globulin fractions of the serum, by the time when the serum albumin and individual globulins have become separated.*

TABLE I.

Patient	Clinical Diagnosis	Complement Fixation	Latex Agglutination	Electroprecipitin
C	Hashimoto's Disease	Positive 1:320	Positive	Positive
D	Hashimoto's Disease	Positive 1:320	Positive	Positive
F	Hashimoto's Disease	Positive 1:60	Negative	Negative
T	Hashimoto's Disease	Positive	Negative	Negative
G1	Hashimoto's Disease	Positive 1:40	Positive only in 1:20	Positive
G2	Hashimoto's Disease	Positive 1:10	Negative	Positive
Mc	Primary Myxoedema	Negative	Positive	Positive
H	See text	Anti Complementary	Positive	See text

in this electroprecipitin technique. It has been found necessary to run a positive control and a paper strip containing test serum only, at the same time as the test serum-antigen strip, in order to compare the globulin fraction for precipitation.

In Figure 1, strip A is the serum of patient "D" (see Table I). Strip B is the same serum with the addition of thyroid antigen. The arrows indicate the starting points for the specimens in each case, but that for the thyroid antigen on Strip B is not shown. Above X is a precipitation band formed in the gamma-globulin fraction — a positive test. Strip C is a stock thyroid antigen only, showing the running speed of the thyroglobulin.

Discussion:

A careful and exacting electrophoretic technique is necessary to obtain ideal and uniform results. Discrepancies which can often be discounted in routine serum protein examination, will show up to give consistently erratic and confusing patterns in electroprecipitation. This is important, as the detection of some precipitation bands on the paper strips are quite difficult to differentiate and experience is necessary before one is able to discern some reactions. However, on the whole, most of the positive tests done in this laboratory have been quite distinctive, and direct comparison with the controls has confirmed the positivity.

Sera F and T (Table I) which had been stored at –20°C. and did not give positive latex or electroprecipitin

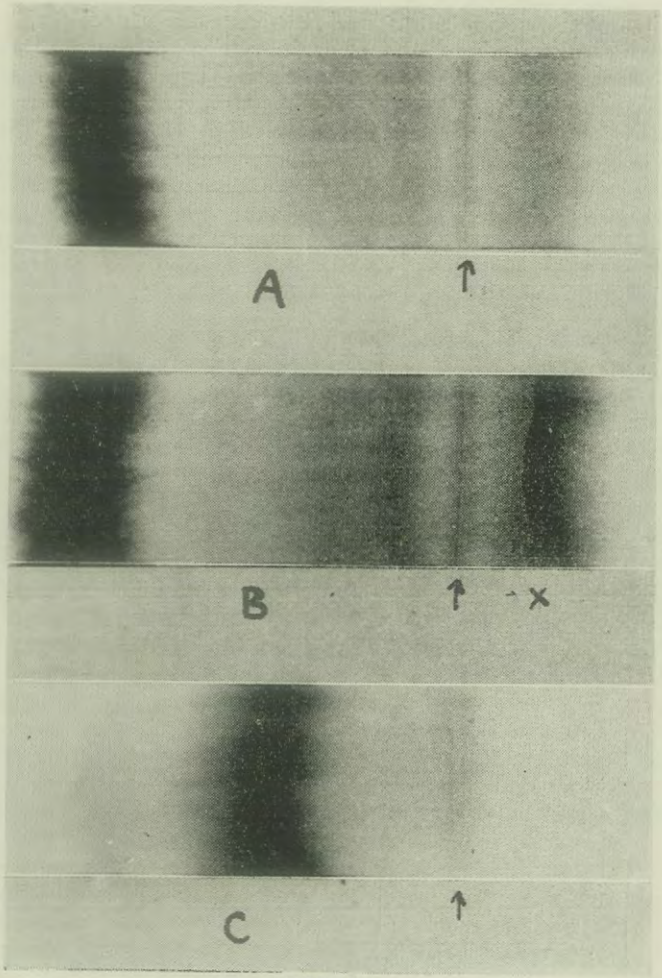

FIG. I.

results, although they were positive by complement fixation, show the value in having more than one type of test for thyroid antibody detection.

Rawstron and Farthing (1962)[6] compared the methods of agar gel diffusion, bentonite flocculation, tanned red cell agglutination, electroprecipitation and latex slide agglutination on sera from cases with Hashimoto's disease and other thyroid disorders. The recommended tests were latex slide agglutination in conjunction with the electroprecipitin method, these being considered as the most useful to the clinician.

Tanned red cell agglutination is extremely sensitive, giving positive results in about 80% of ordinary non-goitrous myxoedema and in some cases of women with no known disease of the thyroid (Owen and Smart, 1958)[4]. But on the other hand, negative or low titres can be obtained in Hashimoto's disease. The bentonite flocculation has almost similar sensitivity to the tanned red cell agglutination in the detection of antibody in Hashimoto's disease, (about 80%) and also in other thyroid disorders, with an occasional exception (Rawstron and Farthing, 1962)[6]. This sensitivity makes the diagnosis of Hashimoto's disease difficult, especially with weak titres.

Latex particle precipitation in capillary tubes is described by Philip *et al.* (1962)[5] and is said to have a sensitivity greater than that of agar gel diffusion, and less than that of tanned red cell agglutination. Rawstron and Farthing (1962)[6] confirm this degree of sensitivity when using the latex slide technique,* and suggest that the latter is more useful to the clinician than the agglutination tests for the diagnosis of Hashimoto's disease. When comparing agar gel diffusion with the latex slide test, Anderson *et al.* (1962)[1] found the latter to be a little unreliable, but probably of value in detecting clinically important degrees of chronic thyroiditis in some patients with thyrotoxicosis.

Trotter, Belyavin and Waddams (1957)[9] demonstrated that Hashimoto sera which were positive by precipitin methods and negative by complement fixation using normal thyroid gland as antigen, could be shown as positive by complement fixation when using thyrotoxic thyroid gland antigen. These authors also demonstrated that complement fixation using this toxic gland antigen, could be shown to give positive results with Hashimoto sera, when no precipitation could be detected. They then suggested that there could be a correlation between lymphadenoid change and the presence of complement fixing antibodies.

Roitt and Doniach (1958)[8] considered that two distinct thyroid antigen-antibody systems were involved, as absorption of precipitins from a Hashimoto serum had no effect on the complement fixation titre. The majority of patients with advanced thyroiditis had both thyroglobulin and complement fixing antibodies, though these could be present independently. They found in their series, that 96 out of 106 sera from patients with Hashimoto's disease gave positive complement fixation results.

There does not appear to be any correlation between precipitin and complement fixation reactions.

The agar gel diffusion technique is less sensitive than the

*Ta-Test, Hyland Laboratories, Los Angeles, U.S.A.

tanned red cell agglutination, giving negative results when the titre by the latter drops from what has been called the "Hashimoto disease level," to the "primary myxoedema level." Although it gives no false positive results with sera from normal persons, it has given positive results in thyrotoxicosis and primary myxoedema, as well as false negatives in Hashimoto's disease., varying from 25-50% (Goudie *et al.*, 1957)[3]. Anderson *et al.*, (1962)[1] considered the agar gel method to be the best single procedure available when small numbers of sera were to be tested and the main objects were the diagnosis of primary hypothyroidism and the differentiation of Hashimoto's disease from other causes of thyroid enlargement. Rawstron and Farthing (1962)[6], comparing 127 patients with various thyroid disorders, found that agar gel diffusion and electroprecipitation gave identical results in all but one serum, where the electro-precipitin only was positive (a case of non-toxic goitre).

In Watson's series of comparison for thyroid disease, in which he used the agar gel diffusion and electroprecipitation methods, he claimed a 96% positivity for detection of antibodies in Hashimoto's disease by precipitation methods[10]. Other workers have claimed between 50% and 75% (Trotter *et al.* 50%[9]; Goudie *et al.* 60%[3]; Roitt, Campbell and Doniach 75%[7]; Roitt and Doniach 66%[8]). Watson[10] also considered the electroprecipitin method to be slightly more sensitive than agar gel diffusion, though this appears to be based on two cases only.

Conclusion:

As yet, there still remains some uncertainty concerning the merits and demerits of the thyroid antibody tests available. The exception appears to be fluorescent microscopy, but as the possibility of performing this type of test is fairly remote in less central laboratories and as the amount of informative literature about its value is not yet great, no discussion or conclusions concerning this technique will be entered upon. Amongst the other tests, four types appear with varying sensitivities. They are tanned red cell agglutination,* complement fixation, latex agglutination and precipitin methods, with sensitivity in that order. The ideal solution obviously, is to include one test from each of these types. This is exactly what this laboratory has done. Our battery of tests includes complement fixation with toxic thyroid gland as antigen; tanned red cell agglutination; latex slide agglutination and the electroprecipitin test.

The policy of doing only one test instead of a number of tests for thyroid disease appears to be inadequate on the evidence put

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forward. There is no single, completely satisfactory screening technique available and therefore, thyroid antibody investigations should involve two or more different tests. This will avoid giving what could be a misleading result to the clinician.

Electroprecipitation takes an important place in the available tests for thyroid disease and is recommended for use in conjunction with other thyroid antibody tests. It can be run at the same time as the routine analysis of serum proteins by electrophoresis, the only deviation being the addition of antigen to the paper strip. This is no real disadvantage as the aliquot can be put on in a few seconds and need not disrupt the routine procedure unduly. There is also an advantage in having a strip containing serum only, which can be observed for routine serum protein analysis.

Acknowledgments

I wish to express my thanks to Dr Sims for suggestions concerning this paper and for permission to use the electrophoretic equipment; also to Mr A. Fischman for an extensive perusal of the contents.

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The Rex Aitken Memorial Prize

It is regretted that in the announcement concerning this prize in our April issue, we inadvertently stated its value to be £5 5s 0d. It has been brought to our attention that the award is in fact worth £25.

In consultation with Biological Laboratories Ltd., the donors of the award, it has been decided to extend the closing date this year, to August 2.

Competition for the Prize is open to all members of the Institute who have published an article of a technical or practical nature, in any periodical, during the year 1962. Intending entrants should submit three copies or reprints of their work to the Editor of this Journal, before the extended closing date.

A Comparative Study of Anti-globulin (Coombs') Reagents Commercially Available in New Zealand

VALERIE M. TOMS,
Pathology Department, Wellington Hospital.
(Received for publication March 1963)

Introduction

Late in 1962 I was invited to examine and comment upon an anti-human globulin (Coombs') reagent new to the New Zealand market. My examinations showed that, although this reagent gave completely satisfactory results with cells sensitised by weak rhesus antibodies, it often failed to give positive reactions when tested against cells sensitised in sera containing weak antibodies of other specificities. Since it is important for a Coombs' reagent used in compatibility tests to be capable of detecting all immune antibodies likely to be encountered, I considered that these findings justified a small-scale investigation of other Coombs' reagents commercially available in New Zealand.

Materials and Methods

Anti-globulin Reagents:

In this investigation, three different commercial products were compared with two non-commercial reagents. An improved preparation from the source of the previously unsatisfactory reagent has been included.

Reagent I is a commercial reagent recommended for use at 1/8. In Wellington, we have used this reagent routinely and find it advisable to titrate each batch against cells sensitised with a weak rhesus antibody, to decide our own optimum dilution. In practice this is usually 1/4 or occasionally 1/2. In this study a dilution of 1/4 was used.

Reagent II appears to be neat rabbit serum. The manufacturers recommend a dilution of 1/160 to 1/320, but claim that the reagent is specific at a dilution of 1/5. In this study three dilutions were used: 1/5, 1/40 and 1/160. The opal tile method[2] is recommended by the manufacturers.

Reagent III is a commercial product issued for use without further dilution. The manufacturers give directions for both the tile and tube methods, but recommend that a tube method[6] is best for non-gamma globulins.

Reagent IV is a non-commercial rabbit serum used at a dilution of 1/40.

Reagent V is a non-commercial goat serum used at 1/20.

Reagents IV and V were included for purposes of comparison.

Cells:

Cells known to be weak reactors or heterozygous for the

appropriate antigen were used, except in the case of the cde/cde papainised cells, which were incubated with the weak Anti-c.

Papainised cells: A 1/10 dilution of Low's (cystein activated papain in M/15 phosphate buffer at pH 6.8 was added to thrice washed, packed red cells in the proportion 4:1. These were incubated at 37° C. for 6 minutes and washed once in saline.

Trypsinised cells: Bacto Trypsin (1% for haemagglutination) was made up according to the Difco specifications and again diluted 1/10 in buffered saline. Four parts of this solution were added to one part of packed, thrice washed cells, incubated for thirty minutes, then washed twice in saline.

Sera:

Each serum used contained an incomplete antibody only, except for the Anti-Le^b and Anti-Lu^a, which also contained a weak saline agglutinin. All sera were used neat, except the Anti-D (titre in albumin 16) which was used at three dilutions.

The Anti-c was very weak, not detectable with untreated homozygous cells by Indirect Coombs' and barely detectable using papainised cells without Indirect Coombs'.

The Tests:

One part of a 50% saline suspension of cells was incubated with two parts of the appropriate serum in tubes. The cells not treated with enzyme were incubated for two hours; those treated with enzyme for 30 minutes.

The cell samples were then washed in four changes of saline. One drop of a 20% suspension from each sample was tested on a tile against one drop of each reagent under examination. The method of Dunsford and Bowley[2] was used with slight differences: the tiles were clear glass, and the results were checked microscopically. After seven minutes, a system of scoring was applied to the degrees of agglutination: 5 is the strongest degree of agglutination; (+) is the weakest, barely perceptible microscopically.

Results of Tests:

With the exception of the results obtained with the 1/5 dilution of Reagent II, these appear in table I. The 1/5 dilution of this reagent was included in the study mainly to confirm the manufacturers' statement that it is specific at this dilution. At this dilution it gives its strongest reaction (2) with Anti-Lu^a and Anti-Le^a (*c.f.* results in table).

Controls:

1. Each cell sample used was incubated also with inert AB serum and treated in the same way as the tests, in order to exclude the possibility of a false positive or non-specific positive result.

2. In the case of the enzyme treated cells, samples of cells lacking the appropriate antigen for the antiserum used, were incubated with the serum and also with AB serum.

3. Ten samples of cells from clotted specimens of donors' blood, which had been stored at 4°C. for 48 hours in their own serum, were tested as follows:— Cells were removed from the clot, washed twice in saline and incubated for two hours at 37°C. with AB serum as in the above tests. The cells were washed in four changes of saline and tested with each Coombs' reagent on a tile.

When donors' cells for crossmatching are stored in their own serum at 4°C. instead of in a sterile acid-citrate dextrose pilot bottle, the possibility of encountering a positive Direct Coombs' reaction in the donors' cells, due to sensitisation with weak, cold, incomplete Anti-H, is increased. A Coombs' reagent which will not cause unnecessary anxiety by detecting such sensitised cells, yet which will detect cells sensitised by any immune antibody, is a necessity. The purpose of this last set of controls was to give a rough indication of whether gross trouble could be expected. A much larger number than this would have to be tested more thoroughly, if it were desired to exclude any proneness to this source of false positive reaction.

Results of Controls:

None of the controls have been included in the table. All were negative with the following exceptions:—

1. *Papainised cells*:

The two cde/cde cells incubated in AB serum, tested with Reagent II at 1/5 were positive (2).

Two CDe/CDe samples of cells incubated in AB serum, tested with Reagent II at 1/5 were positive (2). One of them only, incubated with Anti-c, tested with Reagent II at 1/5 was positive (2) and was also positive (+) with AB serum and with Anti-c when tested with Reagent II at 1/40.

2. *Donors' samples kept at 4°C.*:

Two of the ten only, gave (+) results when tested with Reagent II at 1/5.

TABLE I

CELLS			SERUM	COOMBS' REAGENT I 1/4	II 1/40	II 1/160	III 1/1	IV 1/40	V 1/20
untreated cells	Weak reactor for appropriate antibody	1	Anti-D neat	5	5	5	5	5	5
		2	Anti-D 1/4	5	5	5	5	5	5
		3	Anti-D 1/16	4	4	4	3	4	3
		4	Anti-Kell	4	4	4	2½	4	3
		5	Anti-Kell (010)	2	3	1	(+)	2	(+)
		6	Anti-Wr a	5	5	4	4	4	3
		7	Anti-Fy a (003)	2	3	1½	(+)	2	—
		8	Anti-Fy a (030)	2	3	1	1	2	(+)
		9	Anti-Jk a	2	3	(+)	2	3	1
		10	Anti-Le b	(+)	1	—	—	1	1
		11	Anti-E	5	5	5	5	5	5
		12	Anti-Lu a	1	(+)	(+)	(+)	1	1
papainised	Jk a pos. weak	13	Anti-Jk a	2	3	1	2	2	3
	strong	14	Anti-Jk a	3	3	1	3	3	3
trypsinised	cde/cde	15	Anti-c	1½	2	2	(+)	2	1
	cde/cde	16	Anti-c	1½	2	2	1½	2	1

Analysis of Results of Tests.

In order to facilitate an analysis, I have adopted an arbitrary system of penalties where a particular reagent is inferior to another.

Taking each sensitised cell sample in turn, I find the highest agglutination score, then where any reagent falls below this, I subtract the difference. (+) counts as 0 since it is difficult to read this degree of agglutination. I have not included the enzyme treated cells in this system.

Examples:

Cells 1 and 2 show a score of 5 with all reagents. There are no penalties.

With Cell 3, the highest score is 4. Reagents III and V score 3 and are therefore awarded a penalty of 1 each.

The penalties are tabulated in Table II.

TABLE II
(Penalty Scores)

CELLS	REAGENT					
	I	II 1/40	II 1/160	III	IV	V
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	1	0	1
4	0	0	0	1½	0	1
5	1	0	2	3	1	3
6	0	0	1	1	1	2
7	1	0	1½	3	1	3
8	1	0	2	2	1	3
9	1	0	3	1	0	2
10	1	0	1	1	0	0
11	0	0	0	0	0	0
12	0	1	1	1	0	0
Total Penalties	5	1	11½	14½	4	15

Discussion

From the results it appears that Reagent II should be diluted not 1/160, but 1/40 to be the best (and an excellent) reagent for routine use. At 1/160 it fails to detect antibodies such as Anti-Jk^a and Anti-Le^b, which are often non-gamma globulins, or a mixture of gamma- and non-gamma-globulins, but which may cause haemolytic transfusion reactions[7]. An advantage of Reagent II is its availability in concentrated form. It is always an advantage to have available at least a small quantity of undiluted Coombs' reagent; especially for titrations in cases of auto-immune haemolytic anaemia and for investigating suspected transfusion reactions, where no antibody can be detected by the reagent routinely used in compatibility tests.

Reagent III may fail to pick up weak immune antibodies which could cause haemolytic transfusion reactions. There is no option on the dilution of this reagent, as it cannot be diluted further in the laboratory. To be fair it must be remembered that the manufacturers of this reagent recommend the tube method[6] for non-gamma globulins. There is, however, no way of predicting

the type of antibody to expect in a compatibility test. This would mean that all Indirect Coombs's with this reagent should be carried out in a tube. For most purposes, the tile method is the choice of many serologists [1 3 4 5]. As this study is strictly a comparison of reagents, I have used the tile method for each reagent.

Reagent I is satisfactory at a dilution (for this batch) of 1/4.

All the reagents appear, from the few tests I have done, to be suitable in enzyme Coombs' techniques. Care must be taken to use adequate negative controls and not to use the reagents at low dilutions.

Summary.

It can be seen that there are variations in the quality of Coombs' reagents available in New Zealand and in their ability to detect cells sensitised by different antibodies. None of them is poor enough in quality to cause alarm. The suitability of any one of these reagents must be assessed by taking into account the purposes for which it is used in any particular laboratory.

As we have used Reagent I routinely in Wellington, I have made a few observations on it.

1. Each batch should be titrated with cells sensitised by a weak incomplete Rh antibody and the optimum dilution determined. The manufacturers' recommended dilution is not always the optimum.
2. One batch we obtained contained a strong non-specific antibody, suggesting insufficient absorption.
3. Occasional vials in any batch will give a series of "sticky" Coombs's with every cell tested in compatibility tests. The only defence, if a vial is suspect, is to resort to the unscientific practice of throwing it away and trying another. A clear negative must, naturally, always be controlled by adding a drop of washed, sensitised cells to the test after 7 minutes, and observing agglutination.
4. We have never experienced a vial of this reagent which has been responsible in itself, for a false negative result.

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An Evaluation of the Copper Sulphate Specific Gravity Method for Screening Blood Donors

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(Received for publication April 1963)

Methods for screening large numbers of blood donors, as on mobile bleeding sessions, should be convenient and accurate enough to exclude those with a haemoglobin level lower than an agreed minimum, usually 12-12.5 g. % for females and 13-13.5 g. % for males. For some time the copper sulphate method of Phillips, Van Slyke *et al* (1950)[2] has been used by the Christchurch Mobile Transfusion Unit when operating away from headquarters. It seemed desirable to check the accuracy of this method against a standard method of haemoglobinometry, the main purpose being to determine how many donors with low haemoglobin levels would be wrongly passed as fit by the copper sulphate method (false negatives); the erroneous exclusion of donors with normal haemoglobin levels (false positives) would by comparison, be of less importance. In the investigation to be reported, two series of donors totalling 563 and 74 respectively, were tested by means of both the copper sulphate and an oxyhaemoglobin method.

Methods

The donor's ear lobe was wiped with alcohol and then with dry cotton wool and a puncture made with a B-D disposable lancet. The first drop of blood was wiped away; a little blood was then drawn up in a very fine Pasteur pipette, and a drop expelled into a copper sulphate bottle, in the manner required by the authors of the method.[2] From the same puncture a standard Sahli 20 cmm. pipette was filled and washed into a bottle containing 4ml of 0.04 % ammonia solution. The optical density of this solution was read on a Unicam S.P. 300 colorimeter calibrated by a standard method.

In the first series of 563 donors, copper sulphate of specific gravity 1.051 equal to 12 grams % haemoglobin was used for female donors and 1.053 equal to 13 grams % haemoglobin for male donors. The test bottles contained 50 ml. of solution and were emptied and refilled when 40 tests had been done.

Batches of donors varying from about 10 to 30 were done at a time and the order of doing the test was reversed with each new batch: on one occasion the blood for the copper sulphate test and on the next occasion the blood for the oxyhaemoglobin test, was taken first from the ear puncture. Five different technologists, some rather inexperienced, performed the tests. One technologist carried out all the tests on one batch of donors.

Results

Out of 563 donors 13 (2.3 %) were rejected by both the copper sulphate and the oxyhaemoglobin method: that is they were below 12 grams % if females and below 13 grams % if males. Two male donors were rejected by the copper sulphate and found to be 14.5 and 17 grams % by the oxyhaemoglobin method, obviously indicating errors in technique. One female donor was rejected by the copper sulphate and found to be 12.0 grams % by the oxyhaemoglobin method. (Total false positives 0.53 %).

Four males were passed by the copper sulphate and found to be 12, 12.5, 12.5, and 12.5 grams % by the oxyhaemoglobin method. Eight females were passed by the copper sulphate and found to be 11.5, 11, 10, 11.5, 11.5, 11.5 and 11.5 grams % by the oxyhaemoglobin method. (Total false negatives 2.1 %).

As the copper sulphate method appeared to be passing donors whose haemoglobin level was borderline, it was decided to do another series with copper sulphate of a higher specific gravity. Accordingly a further series of 74 donors was done by the same methods as previously but with copper sulphate of 1.052 equal to 12.35 grams % for females and 1.054 equal to 13.35 grams % for males.

Out of this series of 74, one donor was rejected by both methods. Two male donors were rejected by the copper sulphate and found to be 13.5 and 13.5 by the oxyhaemoglobin method. Three female donors were rejected by the copper sulphate and found to be 12.5, 12.5 and 12.5 by the oxyhaemoglobin method. No donors were passed in this series by the copper sulphate but rejected by the oxyhaemoglobin method, *i.e.* there were no false negatives.

Discussion

Our experience, like that of Perkins and Torg, 1962,[1] suggests that the copper sulphate method, if specific gravities of not less than 1.052 for females are used, is a satisfactory method for screening large numbers of donors provided the technique advised by the authors of the method is carefully followed. In our first series some findings were obviously due to technical errors, and while such results probably can never be entirely eliminated, they can be minimised by careful supervision. Ideally of course, all low haemoglobins or results which do not agree with the appearance and condition of the donor, should be checked by other haemoglobin methods, or by a more extensive blood examination.

Acknowledgment

This survey was suggested by Dr F. W. Gunz and my thanks are due to him for his help in preparing this paper.

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TECHNICAL NOTES

A Rapid Romanowsky Stain

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(Received for publication January 1963)

When dealing with urgent specimens, especially those submitted for examination outside normal working hours, a simple and rapid method of staining films for differential leucocyte counts is of definite value. A technique which has proved satisfactory in this laboratory is described.

Stain

Leishman powdered stain (B.D.H.)	1.5 g.
Giemsa powdered stain (Gurr)	1.0 g.
Sodium bicarbonate AR	0.02g.

Weigh out and transfer to a 2-litre Erlenmeyer conical flask. Add 1 litre of Methyl Alcohol (pure), mix by swirling and place in a water bath at 60°C. for 15-20 minutes, shaking at intervals. Cool, filter into a clean bottle and the stain is ready for use.

Buffer (pH 6.8)

Disodium hydrogen phosphate (anhydrous)	4.539g.
Potassium dihydrogen phosphate	5.940g.

Mix very thoroughly in a mortar and store as a dry powder. The working buffer solution is prepared by dissolving 1g. of the dry ingredients in 2 litres of distilled water.

Rapid Staining Technique

The air-dried blood film is flooded with undiluted stain for one minute. Add two volumes of working buffer solution, mix and leave for one minute, then rinse off with distilled water or buffer and blot gently dry.

Routine Staining Method

Flood the air-dried film with undiluted stain, which is allowed to act for two minutes. Add two volumes of the working buffer solution, mix and allow to stain for 3-5 minutes. Differentiate and wash off with distilled water or buffer and allow to drain dry.

Results

The intensity of staining produced with the rapid technique is not sufficiently detailed for routine use, although it is quite adequate for an accurate differential count.

The quality of staining achieved by the routine technique is comparable with that obtained by the more conventional Romanowsky staining methods.

Abstracts From Other Journals

Contributors to this issue: W. Aldridge, R. D. Allan, J. Case, E. K. Fletcher, J. Rees, H. C. W. Shott and D. Tingle.

BLOOD BANKING

The Significance of Leuco-Agglutinins for Development of Transfusion Reactions. Jensen, K. G. (1962), *Dan. med Bull.*, **9**, 198-202.

On the examination of sera from patients suffering febrile reactions associated with blood transfusion, complete antibodies against the transfused leucocytes were found in 58% of cases. No further reaction occurred when these patients were subsquently tranfused with leucocyte-poor blood.

Haemolytic Transfusion Reaction Due to Interdonor Incompatibility. Zettner, A. and Bove, J. R. (1963), *Transfusion*, **3**, 48.

A case is described in which a haemolytic transfusion reaction developed in a patient who received first a unit of Kell-Positive blood, then a unit whose plasma contained a high titre Anti-Kell. The authors recommend that (1) all blood donors should be screened for the presence of atypical antibodies and (2) the blood from donors whose serum contains atypical antibodies, should not be used for administration to patients likely to receive multiple transfusions.

Antibody Elution from Red Blood Cells. Rubins, H. (1963), *J. clin. Path.*, **16**, 70.

A modification of the method of Vos and Kelsall is described in which elution can be completed in only 15 minutes. The eluates are as potent as previously described methods. J.R.

Duration of Viraemia following an Attack of Infective Hepatitis. Huisman, J., Douglas, H. M. J., Burema, L. and Hermans, E. H. (1960), *Ned. T. Geneesk*, **104**, 1828, cited in an annotation: *Brit. med. J.* (1963), **i**, 5.

A man known to have had mild hepatitis, for which he was in hospital for only four days, was found seventeen years later to be dying of primary carcinoma of the liver. He had been a regular blood donor for the ten years preceding his death and had given donations of blood to 95 patients. Of the 53 patients who could be traced, 8 had definitely developed jaundice following transfusion. As these patients had covered a span of ten years, it had been established that viraemia can be persistent, or at least intermittent, over that period. W.A.

A Second Example of Anti-Xg^a. Cook, I. A., Polley, Margaret J. and Mollison, P. L. (1963), *Lancet*, **i**, 857.

The serum of an elderly man suffering from carcinoma of the stomach was found to contain, in company with Anti-C, the antibody which defines the sex-linked blood group antigen Xg^a. Evidently resulting from an immune response to transfusion, the antibody is detectable with some difficulty, by the Indirect Anti-globulin technique; and is reported to be subject to a rapid decline in titre.

(This article has been abstracted because of its value in support of the argument, that an attempt should be made to establish the identity of all antibodies detected in a blood grouping laboratory. While the provision of compatible blood requires only the rejection of donors appearing to be incompatible, the failure to identify the antibody responsible for the incompatability may occasionally result in the loss of an important discovery. The first example of Anti-Xg^a was reported in 1962 and was very reasonably predicted then that it would be many years before a further example of it would be revealed. The new discovery may be pure coincidence, but on the other hand it seems more probable, that knowledge of the existence of Xg^a antigen resulted in the positive identification of an antibody which might

otherwise have been simply labelled "unidentified." Anti-Xg^a is of immeasurable value in genetic studies and no serum containing it should ever be allowed to pass by.)

A Bromelin Rh Slide Test for Rapidly Typing Patients Prior to Transfusion. Ellis, B.C. (1963), *Amer. J. clin. Path.*, **39**, 129.

A slide technique for rapid rhesus typing is described, in which a solution in physiological saline of 0.5% bromelin and 0.5% disodium E.D.T.A., is used with incomplete Anti-D, against either washed or unwashed cells to an approximately 40% suspension. A control using inert AB serum instead of Anti-Rh, has to be included with each cell tested.

CHEMICAL PATHOLOGY

Critique of the Determination of Proteins in Cerebrospinal Fluid. Evaluation of the Biuret Method of Goa and the T.C.A. Turbidometric Method of Meulemans. Rice, W. E. and Loftes, J. W. (1962), *Clin Chem.*, **8**, 57.

Cerebrospinal fluid protein values obtained by Biuret procedures can give results up to 40 mg. too high because of colour producing non-protein substances. Two methods giving results comparable with a micro-Kjeldahl technique are recommended:

1. The Biuret method of Goa involving protein precipitation and subsequent dissolution, with density reading at 330mμ. This is a little inconvenient.

2. A trichloracetic acid precipitation method of Meulemans. It is very simple. Add 4 ml. of 3% trichloracetic acid to 1 ml. of C.S.F. Leave for ten minutes exactly. Read at 450 mμ against a trichloracetic acid blank. [We have been using this latter method for about a year now. The standard deviation is 3% in our hands and our controls (diluted from standard serum), stay within confidence limits. It is necessary to prepare the 3% trichloracetic acid accurately.] R.D.A.

An Ultramicro Method for the Estimation of Plasma Cholesterol. Duboff, G. S. and Stevenson, W. W. (1962), *Clin. Chem.*, **8**, 105.

This is a Liebermann-Burchard technique applied to 40μl of plasma. Good correlation with macro methods is claimed. Special pipettes, a test tube vibrator and a microhaematocrit centrifuge are required. Rather a large number of steps are involved but this method was designed for field work involving repeated sampling of individuals. R.D.A

A New Assay for Cholesterol Esters in Serum Which is not Affected by Bilirubin. Babson, A. L., Shapiro, P. O. and Phillips, G. E. (1962), *Clin chim. Acta*, **7**, 800.

Ethyl acetate and absolute alcohol is the extraction reagent, while the colour reagent consists of ferric chloride-ethyl acetate, to which is added concentrated sulphuric acid. Digitonin is used for extraction to determine cholesterol esters. The colour is stable for several hours and obeys Beer's Law up to at least 500 mg. cholesterol per 100 ml. Absorption of bilirubin was accomplished by the addition of aluminium hydroxide to the extraction reagent. Studies are carried out on the absorption of bilirubin, the precipitation of free cholesterol and the recovery of added cholesterol. The method is stated as being 'fast and simple.' E.K.F.

Quantitative Separation and Determination of Bilirubin and Conjugated Bilirubin in Human Serum. Weber, A. H. and Schalm, L. (1962), *Clin chim. Acta*, **7**, 805.

Two layers form when a concentrated diazo reagent is added to serum in ethylacetate, lactic acid and chloroform, and the mixture centrifuged. Resultant colours may be estimated qualitatively, or alternatively the upper layer is kept in darkness for one hour then read in a spectrophotometer at 555mμ for quantitative determination of conjugated bilirubin. Even a brief exposure of the serum to light interferes with the procedure, but

serum turbidity has no effect. Haemolysis showed slight increase in the bilirubin but no increase in the conjugated bilirubin. Small volumes of serum (0.04 ml.) were used and reproducibility is about 0.1 mg. of pigment per 100 ml. of serum. E.K.F.

Determination of Total and Ester Cholesterol in Whole Blood, Serum or Plasma. Webster, D. (1962), *Clin chim. Acta*, **7**, 277.

The cholesterols are extracted with petroleum ether and aliquots evaporated to dryness for total and ester determination. Residue for the latter is dissolved in ethanol, treated with a solution of digitonin for ten minutes, then again extracted with petroleum ether and an aliquot evaporated to dryness. The residues for total and ester cholesterol are dissolved in ferric chloride—glacial acetic acid reagent and after the addition of sulphuric acid, are mixed, cooled and compared in a spectrophotometer with a standard prepared in a similar way.

The free cholesterol is extracted completely by the petroleum ether in ½ to 1 minute, and digitonide precipitation is shown to be complete in 10 minutes. Colour stability is stated as lasting one hour after an initial 30 minutes development time. Extensive recovery studies of both free and ester cholesterol are carried out and reproducibility experiments are recorded. E.K.F.

The Estimation of Serum Cholesterol. Jurand, J. and Albert-Recht, F. (1962), *Clin. chim. Acta*, **7**, 522.

Extraction of cholesterol is a petroleum ether technique, and the colour development involves the reaction of a concentrated sulphuric acid—glacial acetic acid reagent on an alcoholic solution of cholesterol. Optical density is read at 500mμ. Experiments are carried out to show the stability of the colour reagent mixture for up to three days, and with a high degree of reproducibility. The addition of ferric and ferrous ions to the colour reagent indicated greater efficiency of the reagent when in the presence of trace amounts of the former. E.K.F.

Observations on the Zak Cholesterol Reaction. Bowman, R. E. and Wolf, R. C. (1962), *Clin. chem.*, **8**, 297.

Two peaks at 560mμ and 490mμ were found in the absorbtion spectrum using reagent grade acetic. Redistilled aldehyde free acetic gave only the usual peak at 560mμ. However, by altering the ratio of colour reagent to glacial acetic from 0.8 to 1.2 (v/v) and mixing the reagents in 50 ml. flasks to keep cool, it was found that a peak at 480mμ afforded twice the optical density of the 560mμ peak. Interference due to colour enhancement by bromide or iodide would seem to be eliminated by adding sufficient NaBr to the acetic acid prior to the reaction, to produce full enhancement. R.D.A.

A Rapid and Specific Ultramicro Method for Total Cholesterol. Bowman, R. E. and Wolf, R. C. (1962), *Clin. Chem.*, **8**, 302.

A serum volume down to 0.01 ml. is extracted with 2.5 ml. of ethanol and an aliquot of the supernatant reacted with Zak reagent. Read after cooling 30 minutes at 550mμ. This modification is advocated in view of the difficulty of preparing aldehyde free acetic acid. (Aldehyde gives a colour reaction with tryptophane). No significant error is said to be produced by haemolysis or bilirubin and this of course would be a great advantage. The results give a reasonable correlation with the Sperry Webb method. R.D.A.

Use of Micromethod for Phenylalanine in Management of Phenylketonuric Patients. Berry, Helen K. (1962), *Clin. Chem.*, **8**, 173.

Ethanol 95% is used to precipitate the protein from capillary blood samples. The alcoholic supernatant is spotted onto Whatman No. 4 and an ascending chromatogram in butanol-ethanol water mixture performed. Standard phenylalanine spots are run in parallel and visually compared with the unknown spots after ninhydrin development. It is suggested for following the progress of ketonuric children on a dietary regime. R.D.A.

CYTOLOGY

A Comparative Study of the Papanicolaou Technique and the Acridine-Orange Fluorescence Method. Wied, G. L. and Manglano, J. I. (1962), *Acta Cytol.*, **6**, 554-568.

A parallel study was carried out on 2,500 specimens from the genital tracts of female patients, using both techniques. The authors conclude that the Acridine-Orange method is superior for cytochemical studies and excellent for the demonstration of microbiology, but that it is no substitute for the original Papanicolaou method for cytological evaluation.

Differentiation of Haemopoietic Elements from Tumour Cells in Blood. McGrew, Elizabeth A., Romsdahl, M. M. and Valaitas, J. (1962), *Acta Cytol.*, **6**, 551-553.

There is useful guidance here for those concerned with the examination of cellular concentrates from blood for malignant cells. The authors studied concentrated nuclear cell elements prepared by Dextran sedimentation, collected on Millipore filters and then stained by the Papanicolaou technique. In all but a few cases, they claim to have been able to differentiate circulating tumour cells from immature blood cells.

A Millipore Filter Technique for Cytological Examination of Body Fluids. Nedelkoff, B. and Christopherson, W. M. (1962), *Amer. J. clin. Path.*, **37**, 97.

25 ml. of heparinised body fluids are mixed with an equal quantity of a special Tween 80 solution. Saponin is used to haemolyse the erythrocytes and the cellular suspension is fixed in buffered alcoholic formalin, then passed through a Millipore filter. The filter is then fixed in a modified Carnoy fixative and finally stained by Papanicolaou or Shorr's stain. D.T.

An Evaluation of Fluorescence Microscopy in Gynaecological Exfoliative Cytology. Taft, P. D. and Losananond, P. (1962), *Amer. J. clin. Path.*, **37**, 334.

Duplicate sets of vaginal and cervical smears were stained with acridine orange and examined by ultra-violet light; and stained by Papanicolaou and examined in the usual manner. The fluorescent method was less sensitive than Papanicolaou, giving larger numbers of doubtful smears. Also the preparations are not permanent and it is difficult to mark slides to locate suspicious cells. D.T.

HAEMATOLOGY

The Use of a New Test for the Control of Intrinsic Coagulation. Potter, E. de and Offner-van den Berghe, C. (1962), *Acta Haemat.*, **28**, 370-377.

The cephalin-bentonite test (C.B.T.) is offered as a reliable technique for the measurement of intrinsic coagulation during the anticoagulant therapy.

While it would seem impractical to measure the intrinsic and extrinsic systems separately on the plasmas of patients undergoing treatment with oral anticoagulants, the C.B.T. may be of some value in the diagnosis of coagulation disorders. It gives reliable and reproducible results, and being independent of platelet numbers and of glass-activation, would appear to be an ideal substitute for the plasma recalcification time.

An Evaluation of the Sanborn Cell Counter. Letts, H. W. (1963), *Amer. J. clin. Path.*, **39**, 104-111.

The author has extensively tested a prototype model of the Sanborn-Frommer model 75 electronic cell counter and compared the results obtained in counting both leucocytes and erythrocytes, with those of a standard haemocytometer. The reproducibility of the instrument was better than $+ - 2\%$, and one of its advantages is said to be the simplicity of the procedures for checking calibration.

The Reticulocyte Count as an Indicator of the Rate of Erythropoiesis. Cline, M. J. and Berlin, N. I. (1963), *Amer. J. clin. Path.*, **39**, 121.

By calculating haemoglobin renewal rates in 68 patients (using red cell survival studies or red cell radioiron turnover, or both), it was shown that a reticulocyte count is not always the accurate guide it is often considered to be. Reasons for discrepancies are discussed.

Nature of a Platelet Agglutinating Factor in Serum of Patients with Idiopathic Thrombocytopenic Purpura. Jackson, D. P., Schmid, H. J., Philip, D. Z., Levin, J. and Conley, C. L. (1963), *J. clin. Invest.*, **42**, 383.

Normal platelets were agglutinated by serum of patients with idiopathic thrombocytopenic purpura (I.T.P.). Serum absorbed with barium sulphate to remove the residual prothrombin failed to agglutinate the platelets. Alpha-tocopherol, a thrombin inhibitor, also inhibited platelet agglutination. Trypsinised platelets failed to agglutinate with thrombin and fresh serum from patients with I.T.P. Observations revealed that the platelet agglutinin in the serum of patients with I.T.P., is thrombin derived from prothrombin remaining after coagulation of thrombocytopenic blood. J.R.

Acrylic Picture Varnish for Thin Stained Films. Thomas, Mair (1963), *J. clin. Path.*, **16**, 91.

An easy method of glazing stained microscope slides with acrylic picture varnish is described. Immersion oil can be wiped off the slides with paper tissues. They can be examined repeatedly and keep indefinitely. Leishman-stained blood films appear a little clearer when varnished. J.R.

Cetrimide as a Lytic Agent in the Enumeration of White Blood Cells with the Coulter Counter. Peterson, R. S. and Karlen, Dorothy (1963), *Amer. J. med. Technol.*, **29**, 97-104.

This paper investigates the superiority of cetrimide as the lytic agent for counting leucocytes with the Coulter counter. 3% acid cetrimide is a more rapid lytic agent than saponin and as it produces a less dense red cell stroma, permits lower threshold settings. There is also less frequent obstruction of the aperture tube.

HISTOPATHOLOGY

A Rapid Method for Preparing Paraffin Sections. Lampros, S. J. (1962), *Amer. J. clin. Path.*, **37**, 77.

Fresh tissue, 3 - 5 mm. thick, is placed in a mixture of equal parts Carnoy's fixative and Dioxane. Place in a vacuum oven at 56°C. and 15 mm. negative pressure until bubbles cease to rise (30 - 40 minutes). Transfer the tissue to fresh Dioxane under the same conditions for 30 - 60 minutes, transfer to molten paraffin wax at 56 - 58°C for 35 - 40 minutes. If bubbles still rise, place in fresh wax for a further 30 minutes. The tissue is now ready for embedding. (Total time, 1½ to 3 hours.) D.T.

A Methylene Blue-Basic Fuchsin Stain for Mast Cells in Paraffin Sections. Menzies, D. W. (1962), *Stain Tech.*, **37**, *43*.

Formalin-fixed paraffin sections are taken to water and stained for five minutes in the following mixture (freshly made up):— 1% aqueous methylene blue—9 ml.; 0.1% aqueous basic fuchsin—9 ml.; glacial acetic acid—2 ml. Sections are washed in water, rinsed in two changes of acetone, cleared in xylol and mounted. Most cell granules stain blue, nuclei red, cytoplasm R.N.A. pale blue, and collagen is colourless. D.T.

MICROBIOLOGY

A Simple Method for Recognition of A Typical Non-Pigmented Pseudomonas Strains Using a Reduction Indicator. Sorensen, Royal H. (1963), *Amer. J. med. Technol.* **29**, 93.

A simple method has been suggested for the rapid identification of members of the genus Pseudomonas, regardless of whether they produce pigment or not, based on their inability to reduce resazurin in 2 hours. J.R.

Bacteriological Aspects of the Use of Ethionamide and Cycloserine in the Treatment of Chronic Pulmonary Tuberculosis. Stewart, Sheila M.; Hall, Eileen; Riddell, R. W. and Somner, A. R. (1962), *Tubercle, Lond.*, **43**, 417.

Methods for determining the sensitivity of tubercle bacilli to ethionamide, pyrazinamide and cycloserine, were assessed by correlating the incidence of drug resistance with bacteriological, clinical and radiographic deterioration, in patients treated with ethionamide and pyrazinamide, or ethionamide and cycloserine. The bacterial resistance was shown to be of clinical significance.

Laboratories engaged in sensitivity testing of strains recovered from patients with pulmonary tuberculosis, may wish to take advantage of the experience gained by the authors, in their evaluation of the methods used.

H.C.W.S.

Anonymous Mycobacteria in England and Wales. Public Health Laboratory Service (1962), *Tubercle, Lond.*, **43**, 432.

Increasing interest has been aroused in recent years, by infections which resemble tubercle clinically, but which are due to mycobacteria other than tubercle bacilli. This paper does a great deal towards a rational approach to the classification of so-called anonymous mycobacteria.

H.C.W.S.

Healthy Carriage of *Staphylococcus aureus*, its Prevalence and Importance. Williams, R. E. O. (1963), *Bact. Rev.*, **27**, 56.

The epidemiological importance of the carrier of *Staphylococcus aureus*, has largely been the concern of cross-infection committees; particularly since the emergence of penicillin resistant staphylococci. This article gives a timely review of the present situation.

H.C.W.S.

MYCOLOGY

Practical Application of Acridine Orange Stain in the Demonstration of Fungi. Clark, R. F. and Hench, M. E. (1962), *Amer. J. clin. Path.*, **37**, 237.

Sputum and tissue smears are air dried and heat fixed, hairs and skin scrapings are wrapped in lens tissue. Slides and tissues are treated with 10% Ferric chloride for two minutes, washed and mounted in saline or 50% glycerol. On examination by blue light fluorescent microscopy, fungi appear brilliant orange-yellow. Ferric chloride is used to prevent most of the tissue staining. Skin scrapings may be mounted in 40% KOH or treated with this prior to staining.

D.T.

SEROLOGY

A Modified Slide Latex Screening Test for Hydatid Disease. Szyfres, B. and Kagan, I. G. (1963), *J. Parasit.*, **49**, 69-72.

A modification of Fischman's technique is described, for the serological diagnosis of hydatid disease. The test takes two minutes to perform and is claimed to be both sensitive and reasonably specific. Full details are given, of the technique, and of the method of preparing the latex antigen.

UNCLASSIFIED

Effect of Tourniquet-Induced Stasis on Blood Determinations. Mull, J. D. and Murphy, W. R. (1963), *Amer. J. clin. Path.*, **39**, 134.

After testing blood samples taken with and without stasis, and with exercise of the forearm at timed intervals, the authors conclude that there is no significant difference in any of the determinations studied. (These included both haematological and biochemical estimations.)

Book Reviews

Clinical Chemical Pathology. Third Edition. C. N. Gray. Edward Arnold Ltd., London. 1963. 196 pages. Price in U.K. 16s.

Progress in the field of chemical pathology has necessitated the production of a third edition of this book, first published in 1953.

This is a small book and, of necessity, cannot be discursive; one is occasionally aware of its condensed nature. For instance; the chapter on renal function, which dwells on clearance tests, glomerular filtration, renal plasma flow and impairment does not refer to the simple initial tests: such tests as colour and appearance of the urine, and the microscopical examination of the deposit, are only dealt with in the appendix.

The chapters on acid-base balance, fluid balance and salt deficiency, brief the reader admirably on the current outlook; and include details of the modern terminology applied to acid-base balance.

I felt that, in the absence of photographic reproductions, density graphs of the protein electrophoresis strips would have been preferable to the poor diagrams with cross-hatching. Macroglobulinaemia and the simple water denaturation test of Sia, might have been mentioned in relation to abnormal protein. Calcium, phosphate and fat metabolism, are thoroughly discussed and adequately illustrated.

The chapter on endocrine disease is well written, and even includes a succinct explanation of the synthesis block of hydrocortisone production through congenital enzyme deficiency, in relation to adrenal hyperplasia; there is also a pituitary feed-back diagram.

A novel approach, is the addition of two special chapters. That on biochemical genetics discusses such things as: galactosaemia; congenital amino-acidurias; favism and porphyrias. Clinical enzymology contains much pertinent information; and sounds a note of caution in regard to the factors influencing enzyme levels, and their significance. There is a sensible appendix, devoted to routine urine tests and a few special tests; also a table of normal and abnormal values.

Here, in brief, is a pocket book in which the author has successfully striven to present an up-to-date account of clinical chemistry — primarily for the clinical student — but which I am sure, will prove a boon to even more august medical personages, and to many workers in the field of chemical pathology.

R.D.A.

Essentials of Chemical Pathology. D. N. Baron. The English Universities Press, London. 247 pages. New paper-back edition — price in N.Z. 15s 6d.

It is an unusual experience, to review a book which has graced the laboratory shelf — or perhaps it would be more correct to say, adorned the laboratory bench — for a number of years. These facts are significant when considering this book, because it is well used, if not exactly new. It is, in fact, the corrected impression of the first edition, published in 1957. The author defines its use, primarily for supplementing the teaching of medical students; and it serves this purpose admirably. The technologist preparing for a specialist examination will find here, the necessary background for methodological studies.

The first part of the book is devoted to general chemical pathology, and in the later chapters, various systems and organs are fully discussed. The book is well illustrated, and the diagrams of body fluid compartments and carbonic acid-bicarbonate ratios, are particularly enlightening.

Throughout, the laboratory tests are sufficiently separated from the general context as to make them intelligible, while avoiding distracting

technicalities. The chapter on lipids breaks into a riot of structural formulae, most of which illuminate some point in the text. The endocrine systems are dealt with in a thorough manner, although the suppression tests for adrenal cortical function do not appear.

Text books, in the main, summarise current knowledge; and one can no longer agree, that transaminase determinations are technically difficult. The ease with which the enzymes concerned with intermediate metabolism can now be measured; and their relationship to cardiac infarction and infective hepatitis; must now be considered worthy of mention. One cannot disguise the fact, that a number of trends and technical advances have occurred—particularly in relation to acid-base balance and to gastric function—which would now merit inclusion. There is an appendix on side room tests from urine and faeces; and a table of normal ranges. The table relating to normal values in children, is particularly useful. R.D.A.

Introduction to Medical Laboratory Technology. Third Edition. F. J. Baker, R. E. Silverton and Eveline D. Luckock. Butterworth & Co. Ltd., London, 1962. 478 pages. Price in N.Z. 46s 6d.

When this book first appeared in 1954, it satisfied a long felt want of the trainee medical laboratory technologist, in that it furnished him with a mine of information on all the aspects of his work. Intended as a guide to those studying for the Intermediate Examination of the Institute of Medical Laboratory Technology in Great Britain, its text was based on the syllabus for the examination, and has been revised to keep abreast of changes in the syllabus, not to mention considerable advances in the fields covered, in a second, and now a third edition.

In separate sections covering (1) General (2) Chemistry (3) Histology (4) Bacteriology (5) Haematology (6) Blood Transfusion Technique and (7) Physiology, the book offers in one volume, much of what the trainee technologist will need to know during the early years of his training. Most of the chapters in the present edition have been extended and that dealing with General Chemistry has been completely rewritten. With production within the financial means of the trainee the prime consideration, it is inevitable that the chief shortcoming of the book should be that each section suffers a little from condensation. The section on Blood Transfusion Technique is not at all adequate for the New Zealand trainee, since it omits any mention of compatability tests, or of screening ante-natal sera. Furthermore, the authors are obviously not *au fait* with some of the later developments, because when describing the technique of rhesus typing with albumin antisera, they still consider it necessary to remove the serum/saline before adding albumin; while enzyme techniques might as well not exist at all.

For the most part, however, the coverage is reasonably complete. There are many appealing features, not least of which are an appendix giving notes on many general topics and a most comprehensive glossary of terms. Most of the illustrations (of which there are 126) are very informative, and the reader will find much material here which is printed nowhere else.

This is a book which no trainee technologist should be without. What it lacks in explanatory detail, it compensates for in wide coverage. Supplemented by references to other text books, it will be as much value to the New Zealand Intermediate candidate, as to his British counterpart; and will serve as a work of reference on certain aspects long after he has passed the Final.

J.C.

The Health Department Examinations

INTERMEDIATE (13th and 27th March, 1963)

Written Paper I.

Time allowed 2 hours

Questions 1 to 40 require no writing and can be answered in less than half an hour. In each question, mark your chosen answer by placing a ring round the letter (a), (b), (c), etc. Hand in the completed cyclostyled sheets attached to your written answers to questions 41, 42, and 43. The total marks for questions 1 - 40 are equivalent to the marks allotted to each of the final questions.

1. The pH range of Topfer's Reagent is (a) 1.9 - 5.4, (b) 2.6 - 5.4, (c) 2.9 - 4.2, (d) 5.6 - 8.3.

2. pH is (a) $\log_{10}H$ (b) $\log 10^{1}$ (c) $\log_2 H$ (d) $-\log_2 H$

3. Which of the following is incorrectly listed as a constituent of Lowenstein-Jensen medium? (a) potassium dihydrogen phosphate (b) magnesium citrate (c) magnesium sulphate (d) agar (e) glycerol (f) potato starch (g) asparagin (h) malachite green (i) salt (j) eggs.

4. Which of the following should not be in Benedict's qualitative solution? (a) sodium citrate (b) sodium carbonate (c) potassium thiocyanate (d) potassium persulphate (e) copper sulphate (f) distilled water (g) potassium ferrocyanide.

5. The citrate used for the collection of blood for the blood bank is (a) disodium (b) dipotassium (c) calcium (d) lithium.

6. Streptomycin is obtained from (a) *Streptomyces griseus* (b) *S. fradiae* (c) *S. chrysogenum* (d) *S. venezuelae*.

7. The result of an Esbach's quantitative test is reported in (a) g./100ml. (b) g./litre (c) mg./100ml. (d) mg./litre.

8. In a Seitz filter the pad is placed (a) rough side uppermost (b) smooth side uppermost (c) either side uppermost.

9. *N. catarrhalis* ferments (a) glucose and maltose (b) glucose only (c) maltose only (d) neither carbohydrate.

10. In Gregerson's test for occult blood (a) benzidene is oxidised by hydrogen peroxide (b) hydrogen peroxide is oxidised by benzidene (c) haemoglobin is oxidised by hydrogen peroxide (d) haemoglobin acts as an inhibitor.

11. Moist heat kills bacteria by (a) denaturing their essential enzymes (b) by the destructive oxidation of essential cell constituents (c) by bursting the cell membrane (d) by destroying ribonucleic acid.

12. Steam under pressure kills bacteria by (a) the pressure exerted on the bacteria (b) the temperature to which the bacteria are exposed (c) the combination of the temperature and the pressure to which they are exposed (d) by removing the air from the top of the autoclave.

13. The temperature of steam at its critical point and a pressure of 15lbs per sq. in. is (a) 108°C. (b) 115°C. (c) 121°C. (d) 126°C.

14. The resolving power of a lens varies (a) inversely as to the N.A. (b) directly as to the N.A. (c) as to the square of the N.A. (d) as to the reciprocal of the square the N.A.

15. The pressure exerted on a particle in a centrifuge bucket is recorded in (a) mu (b) mg. (c) G. (d) gm.

16. The conductivity of distilled water is compared to that of sodium chloride in parts (a) per 10 million (b) per million (c) per 100,000 (d) per 10,000.

17. Refrigerators are defrosted (a) because otherwise they become too cold (b) because is it customary (c) because otherwise it is too difficult to remove the ice trays (d) because otherwise the cooling becomes too inefficient.

18. Which of the following filters is made of asbestos fibres (a) Seitz (b) Chamberland (c) Berkefeld (d) Schott.

19. There are (a) 100 (b) 1,000 (c) 10,000 (d) 100,000 milligrams in a gram.

20. In handling weights for an analytical balance one should use (a) tongs (b) forceps (c) fingers (d) bone-tipped forceps.

21. Digest broth is digested at (a) 56°C. (b) 45°C. (c) 31°C. (d) 22°C.

22. Agar is (a) a polysaccharide (b) a collagen (c) an alcohol (d) a glucoside.

23. The total ruled area of an Improved Neubauer counting chamber is (a) 3 sq. mm. (b) 9 sq. mm. (c) 9 sq. cm. (d) 6 sq. cm.

24. A chemically normal solution contains (a) one gram equivalent per litre (b) one gram molecule per litre (c) one gram molecule per 100 ml. (d) one gram equivalent per 100 ml.

25. When we talk of a $\frac{2}{3}$in objective we are talking of (a) the numerical aperture (b) the focal length (c) the refractive index (d) the diameter of the lens.

26. The smegma bacillus is (a) acid fast (b) alcohol fast (c) acid and alcohol fast.

27. The indicator in thioglycollate is (a) neutral red (b) bromcresol purple (c) resazurin (d) phenolphthalein (e) methylene blue.

28. Bacteriological filters are sometimes tested with (a) *S. aureus* (b) *S. faecalis* (c) *B. coli* (d) *B. prodigiosus.*

29. The substance added to culture media to counteract the effect of sulphonamides is (a) para-amino benzoic acid (b) para-benzoic acid (c) amino-benzoic acid (d) liquoid.

30. Andrade's indicator is made from (a) basic fuchsin (b) acid fuchsin (c) neutral red (d) carbol fuchsin.

31. The life span of a normal red cell is (a) 50 days (b) 60 days (c) 120 days (d) 220 days.

32. The phrase "High temperature-short time" refers to (a) the sterilisation of culture media (b) the pasteurisation of milk (c) enzyme analysis (d) the inactivation of complement.

33. The oxidase reaction is used particularly to identify members of the (a) Coliform (b) Streptococcus (c) Corynebacterium (d) Neisseria groups.

34. "Chloride shift" in blood follows (a) loss of CO_2 from the blood to the air (b) the passage of CO_2 from the air to the blood (c) passage of potassium from the plasma to the cells (d) the haemolysis of the red cells.

35. "Pyrex" glassware is useful in the laboratory because (a) it has a high coefficient of expansion (b) it has a low coefficient of expansion (c) is it easily repaired in the Bunsen burner (d) it is more easily obtained.

36. Which of the following cells give rise to platelets (a) endothelial (b) proerythrocyte (c) megakaryocyte (d) Dorothy-Reed.

37. A bacteriostatic agent is one which (a) kills the bacterium (b) lyses the cell (c) inhibits the multiplication of the cell (d) enables the cell to form spores.

38. At which temperature are Grade A pipettes graduated (a) 21°F. (b) 20°C. (c) 21°C. (d) 25°C.

39. What does the letter D stand for on the stem of a pipette (a) D grade pipette (b) calibrated to deliver (c) unsuitable for accurate work (d) to be dichromated before use.

40. *Shigella sonnei* ferments (a) lactose only (b) lactose and glucose only (c) lactose and mannite only (d) lactose, glucose and mannite.

41. Describe the method for the estimation of urea in urine. Give full details of the preparation of reagents and the calculation of final results using an assumed reading.

42. (a) What blood specimens should be collected and what tests performed on a newly enrolled blood donor? (b) Explain briefly the difference between a Direct and an Indirect Coombs' test. (c) What are some of the technical errors which may occur in the performance of the Coombs' test and what can be done to avoid these errors?

43. Describe the methods for (a) the quantitative detection of an excess of protein and (b) the quantitative estimation of protein, in cerebro-spinal fluid. Give details of all solutions used and outline the principles involved in each method.

Written Paper II *Time allowed 2 hours*

1. Describe fully how you would proceed to carry out a bacteriological examination on a sample of unpasteurised milk. What are thermophilic organisms?

2. What are M.C.V., M.C.H., M.C.H.C. and C.I. and how are they measured? Assuming values for an imaginary blood sample, show how they are worked out.

What errors may be encountered in these estimations and what steps may be taken to counteract them?

3. Describe the preparation of a litre of MacConkey agar from basic material, paying particular attention to the method for the use of a visual hydrogen ion concentration apparatus in this preparation.

4. Write short notes on:—

(a) Pyrogens. (b) The cleaning of glassware for chemical procedures. (c) The growth requirements of *H. influenzae*. (d) The estimation of specific gravity. (e) The first-aid treatment of burns in the laboratory.

Practical Papers

Do all questions. Wherever possible illustrate your answers by rough diagrams. Wherever working is required, show this in your answer. Twelve minutes are allowed for each question.

Group A.

1. Estimate the pH of solution A using the colorimeter provided.

2. Weigh the shilling (B) provided as the test object.

What do you understand by the term "tare" as applied to a balance?

3. Give the probable identification of the organisms in slides (C, D and E).

4. Identify as far as possible the Gram-negative organism (F) provided.

5. Give the composition of the following stains:—

(a) Carbol fuchsin (b) Gram.

Discuss details of their preparation and the reasons for the inclusion of the substances mentioned.

Group B.

6. Carry out a stain for Vincent's organisms on the slide (G) provided and report on your findings.

7. Report on the stained blood films (H, I and J) provided.

8. Count the percentage of reticulocytes in film (K).

9. Complete the estimation of chloride in tube (L) and calculate your answer. Define a normal solution.
(1 ml. of unknown has been added to 3 ml. of acid silver nitrate, the whole digested, cooled and is now ready for titration.)

10. List the steps taken in the estimation of blood sugar, giving several words of explanation for the use of each step. Finally give the formula for the calculation.

Group C.

11. Write note on the five "spots" (M, N, O, P and Q).

12. (R, S and T) are respectively: a corked bottle, a jug and a bottle of agar which are to be autoclaved together. How would you go about this? What precautions would you take?

13. Tube (U) contains urine which has been centrifuged. Carry out a routine test for albumin and report on the deposit.
A stained film is not required.

14. Using the serum (V) set up a Widal test for *Br. abortus*. (Six tubes only.) List briefly the steps you have taken.

15. (W, X and Y) are three blood diluting pipettes. Draw diagrams illustrating their volumes and state how they are used.

Successful Candidates

Bathgate, P. D. ..... Auckland
Beggs, W. A. ..... Auckland
Bott, Miss G. R. ..... Auckland
Bradley, Miss P. D. ..... Blenheim
Clark, K. R. ..... Auckland
Davey, N. C. ..... Auckland
Deacon, A. G. ..... Nelson
Dodd, Miss D. E. ..... Christchurch
Drew, Miss M. G. ..... Wanganui
Ford, M. R. ..... Auckland
Gamlin, Miss B. N. ..... Hawera
Gordon, Miss F. ..... Invercargill
Haigh, W. D. ..... Auckland
Holland, Miss S. ..... Auckland
Horton, Miss J. F. ..... Dunedin
James, A. H. ..... Auckland
James, Miss A. M. ..... Auckland
Johnston, E. M. ..... Auckland
Kelman, Miss J. C. Christchurch
Lee, Miss A. J. ..... Invercargill
Lockwood, B. McK.
Palmerston North
Lun, Miss M. ... Palmerston North
McBride, Miss R. H. ..... Auckland
McDowell, Miss H. M. ... Rotorua
Marsh, Miss R. ..... Wellington
Martin, Miss E. A. ..... Auckland
Palmer, Miss S. ..... Auckland
Paykel, Miss A. D. ..... Auckland
Pitches, D. J. ..... Auckland
Reeves, Miss H. F. ..... Wellington
Rhodes, Miss H. M. ..... Hamilton
Scott, Miss E. L. ..... Dunedin
Sorenson, Mrs M. ..... Invercargill
Stewart A. McD. ..... Dunedin
Tucker, R. H. ..... Nelson
Webb, J. N. ..... Auckland
Weston, O. G. ..... Auckland
Whitefield, Miss J. G. ..... Kaitaia
Wilding, K. C. ..... Auckland
Wong Too, R. ..... Auckland
Wood, R. L. ..... Wanganui

Forty-seven candidates sat the examination, one withdrew and four failed to gain the pass mark.

FINAL-CERTIFICATE OF PROFICIENCY

(3rd, 4th, 17th and 18th April, 1963)

Written Paper.

(Bacteriology.)

Answer all questions. *Time allowed 3 hours.*

1. Describe how you would proceed to examine a swab from a deep wound in a case of suspected gas gangrene. *(30 marks)*

2. (a) Describe the life history of a parasitic Nematode and also that of a Cestode of the human alimentary tract. Describe the morphology of each. *(15 marks)*

(b) Outline the laboratory methods used to confirm infestation. *(5 marks)*

3. Write brief notes on the preparation and use of the following:—

(a) Small-pox vaccine. (b) Tetanus toxoid. (c) B.C.G. (d) Salk vaccine *(5 marks each)*

4. Your hospital, which is a small one, wishes to establish a syringe bank and your advice is sought. Write an outline of the advice you would give under the following headings, giving reasons:—

(a) Preparation of syringes and needles. (b) Packaging. (c) Method of sterilisation. *(8 marks each)*

You are also asked which would be the more economical and efficient (a) The establishment of the suggested syringe bank or (b) the purchase of packed, sterile plastic disposable syringes. *(6 marks)*

Written Paper.

(Biochemistry.)

Answer all questions. *Time allowed 3 hours.*

1. You receive a syringe containing 10 ml. of heparinised blood collected anaerobically from a patient who is cyanosed. Write brief notes on the examinations (within the scope of the syllabus), which you could carry out to assist the physician in his diagnosis. *(20 marks)*

2. Discuss briefly:

(a) The estimation of inorganic phosphorus in serum. (b) The precautions necessary to arrive at an accurate result. *(20 marks)*

3. What do you understand by the term "electrolyte." Write brief notes on the estimation of blood electrolytes. *(20 marks)*

4. Write short notes on any EIGHT of the following:

(a) The detection of Bence-Jones protein. (b) The estimation of cerebro-spinal fluid protein. (c) The estimation of faecal fat. (d) Molar solutions. (e) Van Slyke volumetric burette. (f) Optical Density. (g) Preservatives for shed blood for the estimation of blood glucose. (h) Reducing substances in urine. (i) Nessler's solution. (j) Sorenson's oily lye. (k) Spectral Emission Line. (l) The Liebermann-Burchard Reaction. *(40 marks)*

Written Paper.

(Haematology and Blood Bank Technique.)

Answer all questions. *Time allowed 3 hours.*

1. Discuss the general principles involved in the selection and use of controls in blood grouping procedures. Using these principles indicate and justify the purpose of the controls you set up for:—

(a) Full ABO grouping. (b) Anti-c grouping serum. (c) Identification of pure Anti-D. (d) Screening for ante-natal antibodies using an enzyme technique.

2. It is noticed that in the routine haematology results, the M.C.H.C. is consistently erroneously low. How would you investigate the likely technical errors which could bring this about?

3. A haematological investigation on a young woman aged 25 years admitted to hospital for investigation of pallor and possible mild jaundice, shows the following results:—

Haemoglobin	11g. per 100 ml. (76%)
Haematocrit	36%
W.B.C.	9,000 per cmm.
Differential Count:	
Neutrophils	65%
Eosinophils	1%
Basophils	0%
Lymphocytes	31%
Monocytes	3%

The red cells show marked anisocytosis and polychromasia.

Indicate what further haematological tests should be carried out to elucidate the diagnosis and clearly indicate what the results of each of the tests would contribute to the final answer.

4. Describe the principles underlying the antiglobulin technique (Coombs' Test). Indicate the uses of this test and the possible sources of error.

5. Write notes on:—

(a) Eosinophil counting technique. (b) Thromboplastin Generation Test. (c) Ovalocytosis. (d) Rouleaux formation.

Practical Paper.
(Bacteriology.)
Time three hours.

1. Broth culture "A" is that of an organism recovered from the blood of a patient suffering from acute bacterial endocarditis. Identify the organism and determine its sensitivity to penicillin by the tube method. It is known that the inhibitory concentration lies within the range 5-0.015 μgm penicillin per ml.

You are supplied with the following material:—

(a) Penicillin solution containing 50,000 μgm. per ml.

(b) Sterile graduated 0.1, 1.0 and 10ml. pipettes. Sterile 100 ml. volumetric flask.

(c) Sterile distilled water and nutrient broth.

(d) Sterile 'Universal' containers.

(e) Sterile Pasteur pipettes delivering 50 drops per ml.

(f) Control organism "B" (broth culture).

Proceed as follows:

(a) Dilute the penicillin solution supplied to a strength of 50 μgm. per ml. using a graduated pipette and the volumetric flask provided.

Make further doubling dilutions using distilled water and using the same pipette for each dilution (use 5 ml. volumes).

(c) Add the appropriate volume of each of the aqueous dilutions to broth so that the range 5-0.015 μgm. penicillin per ml. is completed (use 10 ml. final volumes).

(d) Inoculate and incubate overnight and read the results next morning.

(e) Give full details of the procedure which you have followed.

(f) When recording results state whether the inhibition is bactericidal or bacteriostatic.

(35 marks) (The organism was a coagulase positive staphylococcus which showed bacteriostatic inhibition by penicillin in the range 0.15-0.075μgm./ml.

2. Using standard tests, identify the organisms growing on MacConkey plates "C" and "D".
(20 marks) ("C" *E. coli;* "D" *Aerobacter aerogenes)*

3. Stain paraffin section "E" by the Ziehl Neelson method. Give a detailed account of your technique and report your findings.
(20 marks)

4. You are provided with a bacterial suspension of *Brucella abortus* and two inactivated sera "F" and "G". Determine the standard antibody titre in each of these sera.
State in 40 words the use and limitations of the alternative rapid screening test.
(25 marks) (Serum "F" positive to 1/640; serum "G" negative)

Practical Paper.
(Biochemistry)
Time: Three hours.

1. (a) Estimate the serum bilirubin content of specimen (W).
(b) Write brief notes on the 5 spot tests provided.
2. (a) Estimate the alkaline phosphatase content of specimen (X).
(b) Write brief notes on the 5 spot tests provided.
3. (a) Estimate the chloride content of specimen (Y). (b) Check the urine specimen (Z) for the presence of protein and ketones.

Practical Paper.
(Haematology and Blood Bank Technique)
Time: Three hours.

1. Perform ABO grouping tests on the four sets of cells and sera provided. Describe your technique and record the details of your findings. If your findings appear irregular indicate what are the likely causes of the irregularities and what further tests you would carry out to establish the correct grouping. Carry out your tests in tubes and ensure that your technique tests both cells and sera.
(1. AB with Anti-A_1; 2. B with rouleaux; 3. 0 with no iso-agglutinins; 4. A with agglutination of standard 0 cells.)

2. Perform full crossmatching tests between the patient's serum and the three donor cell samples supplied. Use saline, albumin and Indirect Coombs' techniques. Describe the method you have used and record the full details of your results.
(Only donor 2 was compatible. Donor 1 was strongly incompatible by albumin and Indirect Coombs' techniques; donor 3 was incompatible by Indirect Coombs' technique only).

3. Examine the six stained blood films supplied. Report your findings in detail, describing the morphological characteristics you have observed.
(1. Infectious mononucleosis; 2. Pernicious anaemia; 3. Chronic granulocytic leukaemia; 4. Spherocytosis; 5. Iron deficiency after 7 days iron therapy; 6. Chronic lymphocytic leukaemia.)

Successful Candidates

Bailey, Miss V. A. ..... Auckland
Beagley, Miss E. A. ..... Auckland
Clist, M. S. G. ..... Auckland
Coleman, R. J. ..... Wanganui
Fisher, D. A. I. ..... Auckland
Fletcher, E. K. ..... Dunedin
Foley, Miss A. M. ... Christchurch
Henwood, D. G. ..... Auckland
Hodgetts, Mrs J. A. ... Wellington
Hudson, Mrs M. B. Christchurch
McHardy, R. C. ..... Wellington
Martin, T. B. ..... Auckland
Montgomerie, Miss J. E. Palmerston North
Moss, Mrs L. ..... Christchurch
O'Meara, F. B. ..... Rotorua
Peters, M. R. ..... Auckland
Phillips, O. R. ..... Auckland
de Silva, G. D. ..... Auckland
Slee, Miss E. A. ..... Christchurch
Smith, Miss J. B. ..... Wellington
Stunzer, H. F. ..... Auckland
Tucker, Miss V. M. Christchurch
Twentyman, Miss J. ..... Thames
Wiggle, W. J. ..... Auckland

Twenty-nine candidates sat the examination, two failed, three obtained partial passes, and twenty-four were successful.

Branch Reports

DUNEDIN

(Secretary: E. K. Fletcher, Pathology Dept., Medical School, Dunedin)

Recent meetings have been characterised by a short business session, an entertaining hour provided by a guest speaker from the staff, and an informal supper.

Business has centred on the discussion of proposed remits for the forthcoming Annual Conference, while travel has essentially been the focus of guest speakers.

Dr E. F. D'Ath presented an enlightening and amusing talk on his recent travels overseas, which included stops in Turkey, Greece, London and Moscow.

Dr MacNamara spoke and showed films of an expedition to Fiji, which was concerned with the collection of evidence on the vectors of arthropod-borne viruses.

Dr J. B. Howie presented colour transparencies taken during his visit to Mexico.

Future meetings include a programme of films of technical interest on June 12, and a further demonstration and conversazione evening in July, to which it is hoped that the main contribution will be made by the junior members.

WAIKATO - BAY OF PLENTY GROUP

An inaugural meeting of technologists from laboratories in the Waikato-Bay of Plenty area was held towards the end of 1962 at the Waikato Hospital, Hamilton. It was decided not to form an official Branch of the Institute, but to meet informally every four months with a view to participating in an exchange and discussion of purely technical matters. The meetings would take place in rotation at Hamilton, Rotorua and Tauranga.

The first meeting was well attended by staff from seven laboratories in Whakatane, Tauranga, Rotorua and Hamilton. Several papers were read and a question and answer session was conducted, in which each laboratory presented its own particular answer to questions and problems raised. The meeting commenced at 11 a.m., with lunch being provided, and closed at 4 p.m. with a tour of the laboratory.

A second meeting was held at Rotorua Hospital in March this year and was attended by 50 members. Five papers were presented and a film shown during the first half, followed by an informal discussion in the course of a laboratory tour with demonstrations of techniques.

Papers read were:

"*Quantitative Urine Culture.*" Mr B. O'Meara (Rotorua).

"*Urea Estimation (Modified With-Peterson Method).*" Mr C. Blackshaw (Whakatane).

"*Westergren E.S.R. and E.D.T.A.*" Mr P. McLoughlin (Rotorua).

"*Pelger-Huet Anomaly.*" Mr D. Smith (Tauranga).

"*Cytology and Ca Cells.*" Mrs Hindess (Waikato).

The next meeting will take place at Tauranga.

G.R.G.

(Although this group has decided to refrain from seeking official recognition as a Branch of the Institute, it was considered that its meetings were of sufficient interest to merit inclusion along with the regular reports from the established Branches.)

Council Notes

A Council Meeting was held at Wellington Hospital on Saturday, June 8, 1963. Present were H. T. G. Olive (in the chair), Mrs J. Hodgetts, Miss J. Mattingley and Messrs H. Bloore, J. Case, M. McL. Donnell, G. R. George and J. D. R. Morgan. Apologies were received from Messrs H. E. Hutchings and D. J. Philip.

Examinations

A Certificate of Proficiency Examination will be held in October this year. In view of the small number of candidates, the practical and oral sections of the examination will be conducted at one centre, Wellington. Henceforth, the examination will take place only once yearly, with special examinations in single subjects in October, to meet the needs of entrants who obtain partial passes.

The facilities of the Auckland Hospital Board's training scheme have now been offered to trainees working outside the Board's area, by means of a correspondence course.

The syllabuses of the Intermediate, Certificate of Proficiency and Fellowship examinations are to be further considered at a meeting of the Examination Board due to be held on July 11; it is hoped that the final drafts will be approved at that meeting and published before the end of the current year.

Registration of Technologists

It has been suggested by the Director-General of Health, that a Registration Board might be established to govern the affairs of medical laboratory technologists in New Zealand. The proposed constitution of the Board would include the Director-General, four representatives from the N.Z.I.M.L.T. and three representatives of the N.Z. Society of Pathologists. After some discussion of the implications of the proposal, it was agreed that the substance of a memorandum which resulted from a request for legal advice on the subject a few years ago, might be published in the Journal for the benefit of the general membership.

Salary Submissions

The amendments to the Hospital Employment Regulations printed in the April issue of the Journal, represented the full extent of the concessions. The appeals for facilities for the granting of sabbatical leave to senior technologists, for the payment of penal overtime rates, for financial reward to technologists other than tutor technologists required to give lectures to trainees, and for a review of the salary structure, were all rejected.

The Journal

Permission was granted to the Journal Committee, to increase the subscription rate for non-members to ten shilling per annum. This move was necessary to cover the cost of the Journal's increased size and of the steadily mounting printing costs. In addition, it was agreed that the Journal should be withheld from members falling behind with their Institute subscriptions. It was further agreed that, in common with many similar publications, reprints should be offered to contributors at their own expense. It was not considered advisable at present, to resume quarterly publication.

Finance

The credit balance stands at £229 11s 11d.

New Members

One hundred and four applications were approved:

Senior

Duggan, Miss L. ..... Auckland
Fisher, D. A. I. ..... Auckland
Glynn-Jones, B. ..... Dunedin
Hitchcock, Miss D. E. Wellington
McKenzie, Miss J. M. ... Auckland
Mitchison, B. ..... Hastings
Norris, Miss D. ..... Wellington
Pearmain, G. E. ..... Hastings
Tingle, D. ..... Dunedin

Junior

Aldworth, Miss J. M.
New Plymouth
Anderson, M. ..... Auckland
Anderson, Miss R. E. ..... Balclutha
Archdall, Miss J. R. ..... Auckland
Bain, Miss K. W. ..... Auckland
Balgarnie, Miss J. A. ..... Auckland
Bend, Miss D. ..... Auckland
Cameron, Miss C. L. ... Wellington
Cattermole, M. J. ..... Ashburton
Christie, Miss J. D. ..... Hamilton
Clifton, R. E. ..... Dunedin
Colgate, Miss P. A. ..... Wellington
Conder, Miss M. L. ..... Auckland
Cornere, B. M. ..... Auckland
Crutch, E. R. ..... Hawera
Curtis, Miss A. A. ..... Auckland
Dawson, Miss R. ..... Auckland
Dickey, W. G. ..... Auckland
Dingle, Miss C. M.
New Plymouth
Dold, G. E. ..... Hamilton
Doy, Miss L. J. ..... Dargaville
Duncan, Miss K. Y. ..... Napier
Elliott, B. J. P. ..... Auckland
Elliott, J. E. ..... Wellington
Erceg, Miss F. T. ..... Auckland
Fagg, Miss F. E. ..... Dunedin
Fisher, M. P. ..... Wellington
Frieberg, Miss E. M. ..... Auckland
Gainsford, Miss S. A. ..... Blenheim
Gardner, Miss G. K. ... Masterton
Gilmour-Wilson, Miss S. Masterton
Glover, G. C. ..... Auckland
Goodall, Miss S. M. ..... Hastings
Goode, Miss A. ..... Auckland
Gray, Miss M. J. ..... Dunedin
Hamilton, Miss J. M. ..... Nelson
Hamilton, T. ..... Auckland
Hay, Miss E. O. ..... Auckland
Higgott, Miss M. C. ..... Auckland
Holloway, R. J. ..... Invercargill
Hooley, Miss P. K. ..... Auckland
Hrstich, Miss S. M. ..... Auckland
Hume, Miss C. A. ..... Auckland
Irvine, Miss S. P. H. ..... Auckland
Kean, Miss M. ..... Auckland
Keedwell, Miss D. ..... Masterton
Kettle, Miss K. ..... Auckland
King, Miss M. J. ..... Hamilton
Kirkham, B. M. ..... Auckland
Kyle, Miss I. R. ..... Waipukurau
Lawton, Miss J. D. ..... Hamilton
McCombie, Miss R. M. Auckland
MacDonald, Miss C. C.
Christchurch
McIntosh, J. T. ..... Hamilton
McLaren, G. ..... Oamaru
McLauchlan, Miss M. R.
Christchurch
McLauchlan, J. H. ..... Auckland
Manttan, B. McK. ..... Auckland
Marshall, J. B. ..... Auckland
Masters, P. R. ..... Greymouth
Matheson, Miss L. M. ..... Dunedin
Mayes, R. G. ..... Rotorua
Montgomery, J. ..... Auckland
Nicholls, Miss J. M. ..... Hamilton
Nicholson, C. ..... Auckland
Oxnam, Miss N. C. ..... Nelson
Paice, Miss A. ..... Auckland
Paine, N. C. ..... Gisborne
Paterson, Miss Y. C. ..... Auckland
Paykel, Miss A. D. ..... Auckland
Postles, Miss M. P. ..... Auckland
Reed, Miss M. F. ..... Auckland
Ricketts, J. ..... Auckland
Robinson, Miss J. A. ... Wellington
Rutherford, Miss R. ..... Auckland
Scott, Miss E. L. ..... Dunedin
Skidmore, P. H. ..... Christchurch
Snook, D. B. ..... Hamilton
Steven, Miss S. ..... Auckland
Subritzky, N. G. ..... Auckland
Thorne, G. ..... Auckland
Titheridge, A. C. ..... Christchurch
Tunua, Miss C. ..... Auckland
Ushakoff, Miss M. ..... Auckland
Van den Bemd, E.
Palmerston North
Wallace, Miss P. J. ..... Timaru
Watkins, Miss J. L. ..... Hamilton
Watt, G. W. ..... Auckland
Wheelhouse, Miss J. ..... Auckland
Whitehead, Miss J. ..... Auckland
Willis, Miss J. ..... Hastings
Wilson, W. J. ..... Auckland
Wrightson, Miss M. L. ... Auckland
Yeates, N. J. ..... Auckland
Yeoman, D. ..... Auckland

Four other applications were held over, pending consideration of qualifications for senior membership.

Resignations

Cater, Miss J., Rotorua. Laws, Miss J., Auckland. Tannock, G. W., Dunedin.

List of Members

Council agreed that a list of members might be published at two-yearly intervals, but felt that this could be circulated in cyclostyled form rather than printed in the Journal.

Examination Papers

It was considered unnecessary to print all past examination papers, since these are already available in back numbers of the Journal.

Remits for Conference

Remits from Auckland and Wellington were briefly discussed, and passed to go forward for Conference.

Annual Conference

An advance of £40 was voted to the Conference Secretary to cover preliminary expenses.

The Secretary was instructed to arrange for the tape recording of the business at this year's Annual Conference.

New Rules

Discussion centred on the amendments necessary to provide for the admission of members as Fellows, Associates or Members of the Institute; and also on the matter of Council representation on a Regional basis. A draft of the proposed new clauses will be circulated to members in time for final consideration at the Conference.

The Library

The following periodicals are received by the Journal Committee in exchange for copies of our own Journal:—

American Journal of Medical Technology.
Annales Medicinae Experimentalis et Biologiae Fenniae.
Archives de l'Institute Pasteur Hellenique.
Australian Journal of Biological Sciences.
Canadian Journal of Medical Technology.
Journal of Medical Laboratory Technology.
Lab World.
Medical Technology in Australia.
New Zealand Hospital.
South African Journal of Medical Laboratory Technology.

Members may borrow any issues of these periodicals which may be available, and enquiries should be addressed to the Librarian:

Mr J. Rees.
Pathology Department,
Medical School, Dunedin.

The Huckster

Ever recurring events in the lives of many of us, are the periodical calls of the emissaries of various firms of laboratory suppliers. Besides constituting a grave threat to the day's well-ordered routine in your laboratory, these visitations are a dangerous menace to your Hospital Board's economy. The accompanying

notes are intended for the guidance of technologists in senior positions, who are especially prone to this malign affliction.

Commercial Representatives are trained at a special school situated at a secret location just off the main highway between Cape Reinga and Bluff. Their security protected by armed guards and tall barbed wire entanglements, aspirants are imbued with the many crafts of their profession. The school's curriculum includes such items as: the technique of the silent and invisible approach; the evasion of man traps and warning devices; a detailed topographical study of every hospital in New Zealand; dialectics and development of the powers of persuasion; the undetected administration of narcotics and, not least, hypnosis.

So you imagine you are a match for the graduate from this select academy? Brother and sister technologist, you were never more mistaken! By the time the Qualified Representative is issued with his voluminous brief case and turned loose on the highways of our country, he is capable of outwitting the canniest, of out-talking the most garrulous of us. With the hide of a pachyderm, he is no longer susceptible to insults; his line of patter subject to constant reinforcement by the material contained in Circulars from Head Office, he is completely irrepressible. No use to prime your staff to declare your absence on leave, for his X-ray vision will outwit you; don't bother to try and sneak off to afternoon tea by the back way, for his knowledge of the labyrinth of tunnels in the basement of your hospital is superior to your own; he can even track you down in the secret sanctuary where you thought yourself safe from the importunities of all, from the office girl to the Medical Superintendent himself.

When you have resigned yourself to the fact that concealment behind the fume cupboard would be futile, that escape through the window undignified and that all other avenues of escape are impossible; when you have finally capitulated; he will strip you of your sales resistance with the ease of peeling a banana. Disarmingly generous, he will produce his cigarettes and offer you one. For the rest of the afternoon he will unashamedly smoke yours, but this initial gesture is important for three reasons. Firstly it helps to establish goodwill by clouding the memory of your inglorious defeat; secondly it creates an atmosphere of *bonhomie* which is essential for your indoctrination; lastly and by no means least, the tobacco will have been impregnated with a drug, whose effect is to promote forgetfulness of the mountain of work accumulating around you, and to make you especially vulnerable to post-hypnotic suggestion. Occasionally, with the benign magnanimity of a philanthropic Maharajah, your visitor may flourish a gift of sufficient matches to light twenty cigarettes a day for twelve months, then smilingly introduce some

such harmless topic as the weather. Meanwhile the vapours from the drug which you are inhaling along with the smoke from smouldering cheap tobacco, are taking their toll of your sensibility. When you show every appearance of having reached the peak of your confidence in your ability to resist his blandishments, your visitor will snap open his brief case . . .

Out will flow the gaily coloured brochures describing and depicting all the answers to your prayers; the machine which is capable of performing, without attention, two hundred blood sugars every hour; the ingenious gadget which would enable you to store your clean pipettes in an orderly array; the attractive gimmick which would ensure the uniform labelling of your reagent bottles — and many more. No matter that you are never called upon to perform more than four blood sugar estimations a week (the advantages of being able to dispose of a whole year's blood sugars in a single hour are obvious to the meanest intelligence); disregard the fact that the hospital carpenter could knock together a replica of the pipette gadget in half an hour; forget that you saw an identical gimmick to the labeller in a chain store priced at three and six; for the moment your imagination is running riot. "Take that centrifuge now . . ." (Surreptitiously examining your pupils for evidence that the effects of the drug are receding, your guest hopes you have forgotten that your gullibility barely four years since, resulted in the purchase of that very machine) ". . . it is completely out of date. Now here is a new line . . ." (In actual fact, you only unpacked that centrifuge last week. This impious scoundrel's assertion that it has been superseded is correct of course, it was obsolescent when it was ordered. It is not his fault, or yours, that it took a year to persuade the Hospital Board to include its cost on the Capital Estimates; that it took a further year to initiate the order, yet another year for it to be packed and shipped to New Zealand, and that for a further year the Railways Department shunted it from siding to siding throughout its network until someone discovered that it had been landed on the wrong Island. Never mind that history will repeat itself in regard to anything you may be persuaded to order on the present occasion; it is the function of the Representative to attract the taxpayers' money from your Hospital Board through your guileless intercession, not to concern himself with trifles.)

Throughout the afternoon, the interview continues; at length, his notebook crammed with details of other lines concerning which he has undertaken to send you the literature; confident that his influence will persist until you have communicated your urgent needs to the Hospital Board's Secretary; your benefactor prepares to take his leave. He has been eyeing the clock anxiously

for some time. It is now a quarter to six — they will be closed in fifteen minutes. As he directs his footsteps towards the nearest place of refreshment, you will emerge from your stupor to face the neglected blood counts and urine analyses. "Pity he came when we were so busy. Nice chap really. Good thing he told me about that plastic disposable colorimeter . . ."

On the whole perhaps it is wiser than it appears (in the interests of National Prosperity) that your Hospital Board seems to want to veto your requisitions.

The Passionate Bacteriologist to His Love

Come live with me and be my love
Up in the lab., first floor above;
Where shrouded in hygienic white,
We'll potter through the febrile night.

Up here amid the test-tube racks,
The centifruge, the power packs,
I'll show you botulinous meat,
Mutations of a spirochaete,

Entamoeba's selfish mission
(Delighting in asexual fission)
And, just to elevate your hair,
Some droppings from the Old Grey Mare.

Bacilli with a sunset hue
Will form a little chain for you,
And cocci on a culture plate
Will make your giddy heart gyrate.

You'll see some eggs infected by
A virus from a bloodshot eye;
For your delight, my lover doll,
I'll flourish spleens in alcohol.

With dawn the roosters start to crow;
We'll make a little fungus grow.
If you dig culture, little dove,
Why, come upstairs and be my love.

D.J.L.

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Letters to the Editor

EXAMINATION QUESTIONS

Dear Sir,—I have been carrying out the instructions of the Examination Board in experimenting with multiple selection questions in the Intermediate Examination, and therefore take full responsibility for their content. I also marked the papers and leaned heavily on the side of the examinees in so doing. I can therefore assure Mentor (April 1963), that his trainees' marks would be an accurate indication of their knowledge.

My personal opinion is, that this type of paper is of limited value, although it enables a wide field to be covered. Lest I be accused of asking absurd or fatuous questions in the last examination paper, may I remark that a surprising number of students chose them as their answers.

DOUGLAS WHILLANS,
22nd May 1963.

THE EMPLOYMENT REGULATIONS

Dear Sir,—By the time that this letter appears we hope that a great deal more thought, by many more people, will have been given to the implications of the wording of the additions to our employment regulations, regarding the employment of Hospital Scientific Officers.

We feel it is time for each one of us to work out very carefully, very thoughtfully, the long and short-term implications for the standard of hospital laboratory work in general and for those who are not graduates; and above all the implications regarding our Institute, its aims and its viability.

We should all be aware by now, that the Graduate Trainee no longer exists, in spite of the fact that, apart from specialised graduates, every hospital laboratory worker needs to be trained in hospital laboratory techniques. The new regulations make no provision for any graduate to have to sit the Certificate of Proficiency, although an integral part of training is the stimulus provided by an examination. A graduate with any type of degree — "appropriate" being so loosely defined — commences in the laboratory on a salary £60 p.a. higher than the fifth year trainee who is the backbone of many a laboratory; is capable of doing call and night duty; and will, when trained, be available for staffing small laboratories.

One of the first questions we must ask ourselves is — *Why are these regulations so loosely worded, leaving them so open to abuse?* We should all take steps to discover the nature of the original submissions to the Salaries Advisory Committee. It is no use searching through Council 'Minutes' in our Journals for details, for we will not find them there in any form; only vague references. Our Institute has a subcommittee which met a subcommittee from the Society of Pathologists to decide on submissions to the Salaries Advisory Committee. We have every reason to suppose that these submissions were worded in a far more sensible form than the regulations that emerged.

These are important facts; but far more important, are the implications arising out of them.

How is it possible that such important decisions are made, which hold every possibility of splitting our Institute, when our Institute itself has a hand in the making of them? In what respect must we, as members of the Institute, hold ourselves responsible?

Should we have insisted far more energetically in the past on knowing more about decisions affecting all of us? How is it that we were deterred in

our insistence on the few occasions when the subject of the lack of such information was brought up?

We feel we should all come to life before it is too late. It is the responsibility of every one of us to become fully informed about the Institute that represents us; the Committees, such as the Salaries Advisory Committee, which are the organs through which submissions pass to the Government to be made into regulations; the avenues that are open to us, if any, to have decisions altered; any proposals that are in the air for new Committees on which our Institute would have representatives, and so on.

We anxiously await some sign that there are others as concerned as we are, and hope that our concern is not too late.

JOAN ALEXANDER, M.Sc.
I. BARDSLEY
HELEN BOND
PAULINE CULY
PHILLIPPA DENTON
ATHOLIE DUNNACHIE
NGAERE ELLERM
VIVIENNE GODKIN, B.Sc.
DOROTHY HITCHCOCK
JUDY HODGETTS, B.Sc.
R. McHARDY
JANET MACKINTOSH
RANI PARKER, B.Sc., A.N.Z.I.C.
JANET PERRY, B.Sc.
HELEN RANFORD
A. L. SCHWASS
GILLIAN SHOOTER
ANN SOUTHERN
D. TAYLOR
VALERIE TOMS

1st June 1963.

Annual Conference — Dunedin

AUGUST 22 and 23, 1963.

Have you returned the questionnaire? Papers, demonstrations and points for discussion are still required. Even if you are unable to attend in person you can have your queries discussed by simply filling in the form and dispatching to the Conference Secretary, Chemical Pathology Laboratory, Pathology Department, Medical School, Dunedin.

All financial transactions will be carried out at the conference. Please do not send any money with the form.

Vacancies

HOSPITAL LABORATORY TECHNOLOGIST
HAEMATOLOGY AND BLOOD TRANSFUSION

Applications are invited from holders of the Certificate of Proficiency in Hospital Laboratory Practice, for the post of Staff Medical Laboratory Technologist in the Haematology and Blood Group Serology Section of the Pathology Department at Otago University Medical School, Dunedin.

Facilities exist for the successful applicant to study for the proposed Fellowship Examination in Haematology and Blood Transfusion Technique.

Salary according to the Hospital Employment Regulations.

Applications, which should include the names of two referees, should be in the hands of the Registrar, University of Otago, P.O. Box 56, Dunedin, by 22nd July, 1963.

MEDICAL LABORATORY TECHNOLOGIST

A private medical laboratory at Takapuna, Auckland, has a vacancy for a qualified Medical Laboratory Technologist.

Apply
17 Anzac Street,
Takapuna,
Auckland, N.2.

CLASSIFIED ADVERTISEMENTS

under such heading as:
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Enquiries to:
The Advertising Manager,
Microbiology Department,
Medical School,
Dunedin.

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PRINTED BY THE EVENING STAR CO. LTD.