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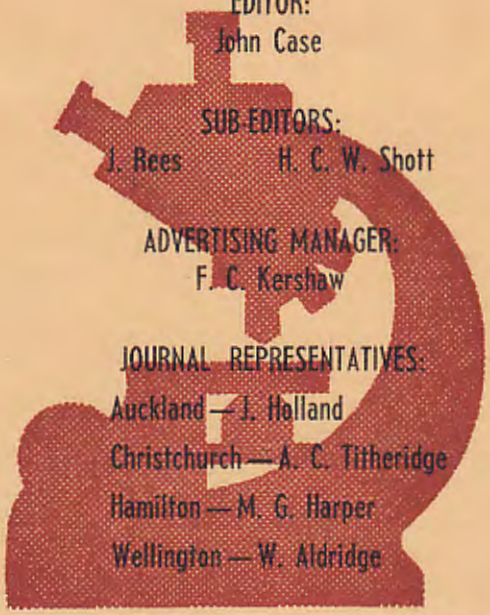

VOLUME 19. No. 1. MARCH, 1965

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THE NEW ZEALAND JOURNAL OF MEDICAL LABORATORY TECHNOLOGY

VOLUME 19. No. 1. MARCH, 1965.

The Journal is published thrice yearly (in March, July and November) 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.

Inquiries 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.

Directions for Contributors

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.

ILLUSTRATIONS. Graphs and diagrams are termed 'figures' and should be numbered in the order of their appearance in the text. Figures should be drawn in Indian ink on stout white paper larger than required for the text. Legends to the figures should be typed separately and attached. Illustrations, particularly half tone blocks, should be sparingly used. Half tone blocks are referred to as 'plates' and these again are numbered in sequence and the captions are typed and attached. Elaborate tables should be kept to a minimum but any necessary tables should be typed on separate sheets of paper and numbered in roman numerals.

NOMENCLATURE. Scientific names of micro-organisms should conform with the system adopted in the latest edition of *Bergey's Manual of Determinative Bacteriology* and underlined to indicate that they are to be printed in italics. Collective names for groups of bacteria such as staphylococci, salmonellae, etc., should not be underlined. Abbreviations such as C.S.F. for cerebro-spinal fluid, are only permissible if their meaning is clearly indicated when first introduced. Conventional abbreviations such as ml. for millilitre and cmm. for cubic millimetre are acceptable without explanation. Names of chemical substances should conform to current chemical practice and care should be taken to see that chemical formulae are correct.

REFERENCES: Only papers closely related to the author's work should be quoted. Contributors should study this issue of the Journal for examples of the preferred method of making reference. All references are brought together at the end in alphabetical order and numbered. In the list, references should include (1) Surname followed by the initials of the author(s), (2) Year of publication in brackets (3) Abbreviated title of the periodical according to *World List of Scientific Periodicals* or to *World Medical Periodicals* (underlined), (4) Volume, (5) Page numbers. If there are three or more authors the words *et al* may be added to the name of the first author in the text, but the names of all co-authors must be given in the list. References to books should include (1) Author(s) or Editor(s), (2) Year of publication in brackets, (3) Title (underlined), (4) Edition, (5) Page number referred to, (6) Name of Publisher and Place of Publication.

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PROOFS. Whenever time permits, authors will have the opportunity to correct galley proofs before publication. No major alterations will be permitted unless the author is prepared to stand the cost, and proofs must be returned within three days of receipt.

Taking Stock

Since the New Zealand Association of Bacteriologists was founded in 1945 there has been, besides a change of name, a ten-fold increase in the membership. The expanding complexity of the routine work in the medical laboratory is seen in the tremendously changed pattern of the examination questions; and the elevated salary scales reflect not only the progressive devaluation of our currency, but also the progressive re-evaluation of the value of our profession (as we have developed the rather pretentious habit of calling it) to the community.

It would be fair to say that we have come a good distance in the past twenty years, and it may be to our advantage to examine our achievements and to decide what we are going to expect between now and 1985.

Many important and far-reaching decisions have been taken at our annual conferences in the past, but these gatherings have not always been characterised by the high standard of debate and the sense of responsibility of which we should like to think ourselves capable. The quality of the technical presentations is generally a credit to us, but we show an increasing tendency to discuss unrealistic motions; and the formation of branches in recent years — in many ways a laudable development — has resulted in considerably more parochial bickering.

With the Twenty-first Birthday Conference advertised to take place in August, perhaps we should do well to appraise the proceedings of the last twenty conferences, with a view to giving a new adult look to our coming-of-age. J.C.

The Isolation of *Staphylococcus aureus* Using Polymixin B Sulphate Medium

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National Health Institute, Wellington.
(Received for publication June, 1964.)

Introduction

It was reported in an article by Finegold and Sweeney[2] that 75 μg./ml. of Polymixin B sulphate incorporated in nutrient medium gave the best results for the rapid isolation of *Staphylococcus aureus.*

The medium was stable, easy to prepare and relatively inexpensive, giving rapid and abundant growth of *S. aureus* in 24 hours.

The medium would be useful as a primary isolation medium in carrier surveys, in studies of hospital environment and in research studies.

The aim of the present study was to determine whether Polymixin B sulphate medium would prove satisfactory for the reliable isolation of *S. aureus,* realising that this work, in times of widespread epidemic, may be done by a relatively inexperienced technician. In isolating *S. aureus* from swabs, faeces and similar specimens, many other organisms are likely to be found. An attempt was therefore made to isolate *S. aureus* from mixed cultures using various inhibitory media.

Materials and Methods

1. *Blood Agar*[5]

A layer of peptone agar (5g. NaCl and 10g. peptone/1 litre, pH 6.8-7.0) was poured into a petri dish and allowed to set. A layer of blood agar (10 ml. of human blood added to 200 ml. of melted blood agar base Difco) was then superimposed on the peptone agar and allowed to set.

2. *Mannite Salt Agar*

This agar was prepared from the Difco product, and poured to a depth of 0.5 cm. in glass petri dishes.

3. *Phenolphthalein Phosphate Agar*

A stock solution of phenolphthalein phosphate 0.5% was added to melted nutrient agar to give a final concentration of 0.01%. The nutrient agar should be left to cool until almost set before the phenolphthalein phosphate solution is added.

4. *Versene Agar*

This medium was prepared by the method described by Richardson[7].

5. *Polymixin B Sulphate Agar*[2]

Polymixin B sulphate was dissolved in distilled water and added to melted nutrient agar to give a final concentration of

75 μg./ml. The polymixin B sulphate solution should not be added until the bottle of melted nutrient agar can be held comfortably in the hand. The agar is then poured to a depth of 0.5 cm. in glass petri dishes.

All agar plates except impression plates[4] were dried for 1 hour at 37°C. before use.

6. *Nutrient Broth* (Difco)

Staphylococcus aureus colonies were subcultured into this medium, which was distributed in bijou bottles in 3-4 ml. amounts and grown for 5 hours, before being used in the coagulase test; and for a further 1-1½ hours before being used to prepare the bacterial lawn in the phage typing of *S. aureus*.

7. *10% Salt Broth*

Nasal swabs were placed in approximately 10 ml. of this medium and incubated for two days at 37°C.

8. *Coagulase Test*

Fisk's coagulase method was used. To 0.5 ml. of a 1/10 dilution of pooled human plasma was added 5 drops of a 5 hour nutrient broth culture of *S. aureus*.

The tubes were then incubated in a 37°C. water bath. After one hour the tubes were examined for the formation of fibrinogen clots, and again at intervals up to 24 hours.

I. COMPARISON USING MIXED CULTURES OF STOCK STRAINS

As a preliminary test, a number of stock strains of *S. aureus* of the following phage types were each inoculated into a nutrient broth.

Group I—A79 (a local variant of phage 79)

Group II—3B/3C/71; 3A/3B/3C/55/71; 3A/3B/3C (RTD x 1000)

Group III—6/7/47/54/75/77; 47/53/75/77; 29/52/42E/-77/80 (RTD x 1000)

Miscellaneous—80/81

In addition two nutrient broth cultures, one of *Bacillus cereus* and the other of *Proteus* (a swarming strain), were incubated for 5 hours at 37°C. 0.5 ml. of *B. cereus* culture was added to each of four staphylococcal broths and 0.5 ml. of *Proteus* suspension to each of the remaining staphylococcal cultures.

The mixtures were then plated on Polymixin B sulphate agar and incubated for 18 hours at 37°C. A control blood agar plate was inoculated to check that the *Proteus* was still swarming.

Results:—

Bacillus cereus and *Staphylococcus aureus* mixed cultures.

B. cereus grew on the plates, heavily at the site of inoculum; but where the inoculum was streaked out, single colonies of *S. aureus* could be picked off.

Proteus and *Staphylococcus aureus* mixed cultures.

After 18 hours incubation at 37°C., *Proteus* and *S. aureus* were observed as single colonies, but on the blood agar the *Proteus* had swarmed over the plate. These Polymixin B plates were left at room temperature for five days, in which time *Proteus* had swarmed completely over each plate. All known strains of *S. aureus* were recovered from the plates.

II. COMPARISON OF ISOLATION RATES FROM SALT BROTHS

As a second step, on the basis of these results, four additional media were chosen to act as comparisons to Polymixin B sulphate agar.

1. Blood agar.
2. Mannite Salt agar.
3. Phenolphthalein phosphate agar
4. Versene Agar

Nasal swabs were taken from twenty-one members of the National Health Institute staff. The swabs, swirled three times in each nostril, were placed in 10% salt broth and incubated at 37°C. for two days. These broths were subcultured on the four additional media, and on Polymixin B sulphate agar. After 18 hours incubation, likely colonies were selected and tested for coagulase production.

Table of Positive Results

Swab No.	Blood	Mannite Salt	Phenolphthalein Phosphate	Versene	Polymixin B
2	—	+	—	late +	+
6	+	+	—	+	+
8	+	—	+	+	+
9	+	+	+	late +	+
10	+	+	+	+	+
13	+	+	+	+	+
14	+	+	+	+	+
15	+	+	+	+	+
16	+	+	+	+	+
Total	8	8	7	9	9

Phage types isolated included

Group I.—29/52; 29/52/80; 52A/79; 52/80

Group II.—3A

Group III. — 7/47/54/75/77+; 42E/6/47/53/54/75/77 (RTD x 1000); 6/7/47/75+

Miscellaneous.—52/52A/80/81; 81 (RTD x 1000)

Discussion

The proportion of positive strains among those colonies selected for testing varied greatly with the medium used.

Blood Agar.

The coagulase test was done on 28 likely colonies yielding eight positives (29%). No further positives grew after reincubation.

Mannite Salt Agar.

The coagulase test was done on twelve colonies, eight were positive (66%).

Phenolphthalein Phosphate Agar.

Twenty-two colonies which were phosphatase positive were tested for coagulase. Seven of these were positive (33%).

Versene Agar.

Nine colonies were selected for coagulase testing and all were positive. Of the nine, only seven had grown after 18 hours incubation. The other two required reincubation overnight at 37°C.

Polymixin B Sulphate Agar.

Staphylococcus aureus colonies were large, with yellow pigment after 18 hours incubation, and all tested were coagulase positive.

III. COMPARISON OF ISOLATION RATES BY DIRECT PLATING

For the third stage in the study the following media were chosen:—

Mannite Salt Agar
Versene Agar
Polymixin B Sulphate Agar

Twenty-two nasal swabs, swirled three times in each nostril, were taken from National Health Institute staff and plated directly on the three media. Plates were incubated for 18 hours at 37°C. and, again, likely colonies were selected and tested for coagulase production.

Table of Positive Results

Swab No.	Mannite Salt Agar	Versene	Polymixin B Sulphate
1	+ 2nd day	No growth	No growth
2	+	+	+
8	+ 2nd day	+	+
11	+	+	+
12	+	+	+
13	+	+	+
18	+	+ 2nd day	+
19	+ 2nd day	+	+
20	+	+	+
21	—	—	+
22	+	+	+
Total	10	9	10

Discussion

Mannite Salt Agar.

From eleven positive swabs, ten strains of *Staphylococcus aureus* were isolated on this medium, including one strain not isolated on the other two media. These plates, however, required an additional overnight incubation for the isolation of three of the strains, and this was considered a disadvantage against the routine use of this medium.

Versene agar.

Nine strains of *S. aureus* were isolated on this agar and, again, additional incubation was required for the isolation of one strain. Colonies were very small on this medium.

Polymixin B Sulphate agar.

Ten strains of *S. aureus* were isolated, one swab giving positive growth on this medium only. *Staphylococcus albus* strains, easily distinguishable from the yellow pigmented *S. aureus* strains, grew only after further incubation. No additional *S. aureus* colonies grew.

IV. USE AS IMPRESSION PLATES

This test was done using impression plates[4] with Polymixin B Sulphate incorporated in nutrient agar. These plates were not dried before use. The following were sampled:—

1. Laboratory hand towel	— no growth
2. Cardigan sleeve	— no growth
3. Above gown pocket (wearer not a known carrier, but working in Staphylococcal laboratory)	— *Staphylococcus aureus* 3B/3C/55/71
4. Laboratory floor	— moderate growth *Bacillus* species
5. Gown sleeve (carrier *Staphylococcus aureus* 52/52A/80/81)	— *Staphylococcus aureus* 52/52A/80/81
6. Wrist burn	— no growth
7. Much-used door	— no growth

V. USE IN AIR SLIT SAMPLER

A final test was undertaken using a medium prepared by adding 75μg./ml. of Polymixin B Sulphate and 4 ml. of 0.5% phenolphthalein phosphate solution to 200 ml. nutrient agar, cooled to 50°C. The melted agar was poured in 15 cm. petri dishes and dried for 1 hour at 37°C. The plates were then placed in an air sampling machine.

The machine was used in a hospital ward which had hanging curtains over the windows. The aim was to isolate, if possible, *S. aureus* strains from the curtains. This proved successful, *S. aureus* colonies showing yellow pigmentation and,

later, very bright pink colouration when exposed to ammonia fumes.

This method would not be of value if a total count was required, because the Polymixin B sulphate is an inhibitory medium.

Summary

Various media have been compared with Polymixin B sulphate agar (75μg./ml.) for the rapid isolation and easy recognition of *Staphylococcus aureus*. The medium proved to be easy to use and reliable for the selective isolation of *S. aureus* but gave no indication of the total count of organisms present in the samples.

Acknowledgments

The author is indebted to the Director-General of Health, Dr H. B. Turbott, for permission to publish this paper and to Dr J. D. Manning, Director and Mrs J. A. Harvey and Miss R. E. Allen, Senior Bacteriologists, National Health Institute, for their help and advice in its publication.

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The Rex Aitken Memorial Prize

Members are reminded that this award of £25 is made through the generosity of Biological Laboratories Ltd. of Auckland.

Competition for the Prize is open to all members of the Institute who have published an article of a technical or practical character in any periodical during the year 1964.

Intending entrants should submit *three* copies or reprints of their work to the Editor of this journal, to reach him not later than May 31, 1965.

Guesswork in the Reading of the Erythrocyte Sedimentation Rate

MARILYN M. EALES, A.N.Z.I.M.L.T.
The Princess Margaret Hospital, Christchurch

(Received for publication August, 1964)

All too often in a busy haematology laboratory, the bell that signals the end of an hour's sedimentation by a row of bloods rings unheard. Who among those who have worked in such a laboratory can claim never to have yielded to the temptation to make a rough deduction from the reading on the tube to estimate what the answer would have been had the reading been taken ten minutes — or more — earlier?

Over the past few months a small survey on overdue Erythrocyte Sedimentation Rates (ESR) was carried out at The Princess Margaret Hospital to prove or disprove the validity of this haphazard method of guessing what the ESR must have been had it been read at the proper time.

The ESR, although not specific, may give valuable information regarding the presence and intensity of pathological changes in the body. If a test is to be of any clinical value, it must be performed under standard conditions. When these conditions are not adhered to the test becomes valueless, even as a rough guide.

182 Sedimentation Rates were included in the survey. They were carried out in batches of five or ten on routine patients, over a period of several weeks. The variation in the day to day temperature was recorded. The method used was that of Westergren and the usual standard conditions were all adhered to. The ESR's were read at the end of one hour, and then again subsequently at 5, 10, 15, 20, 30, 40, 50 and 60 minutes past the hour. The results were quite revealing and were summarised as in Table I.

ESR reading at 1 hour in mm.	5min	10min	15min	20min	30min	40min	50min	60min
1-3	1-2mm	1-3mm	1-3mm	1-4mm	1-5mm	2-6mm	3-8mm	3-12mm
4-5	0-1	1-3	1-3	2-5	2-6	3-8	4-9	8-11
6	0-1	0-2	1-3	3-5	4-6	6-11	8-13	9-15
7	0-6	1-10	2-13	2-11	4-16	5-18	7-21	9-25
8-9	1-3	1-4	2-5	2-6	4-7	6-12	7-14	9-10
10-11	0-3	1-7	1-11	2-12	4-16	7-16	10-18	11-21
12-14	0-5	0-7	0-8	1-14	2-14	6-23	8-26	9-30
15-20	2-5	3-8	5-9	5-12	10-15	12-20	14-28	21-31
21-25	1-4	3-8	5-9	6-14	7-18	13-24	17-28	19-35
26-30	1-5	4-12	9-15	9-18	12-24	14-27	17-35	20-41
31-40	2-6	6-13	10-18	13-22	17-28	24-33	22-42	28-41
41-50	0-8	5-10	8-17	10-16	16-25	21-39	27-41	31-51
51-70	5-7	8-11	5-13	13-27	21-28	25-31	29-47	3-58
71-100	4-23	6-29	9-25	12-38	12-44	12-50	13-47	14-49
101-150 plus	0-8	0-12	2-15	2-18	3-24	3-29	4-30	4-32

Table I. Showing the wide variation in the rates of sedimentation over the second hour.

There appeared to be no pattern in the rate of fall of the ESR. For instance, an ESR which read 24 mm. at the end of the standard time of one hour, could have dropped another 3-8 mm. in another 10 minutes or 7-18 mm. in another 30 minutes. Similarly, an ESR of 80 mm. at the end of one hour could have dropped an extra 7 mm., or 29 mm., or somewhere between the two at 1 hour 10 minutes. The temperatures varied from day to day, reading between 19°C and 24°C., the average day temperature being 22°C. This slight variation did not appear to affect the results to any marked degree, by retarding or accelerating the rate of fall of the ESR. For instance, ESRs which read 20 mm. at the end of one hour when the temperature recorded was 24°C., showed different rates of fall, following the elapse of the timed period. (Fig. 1).

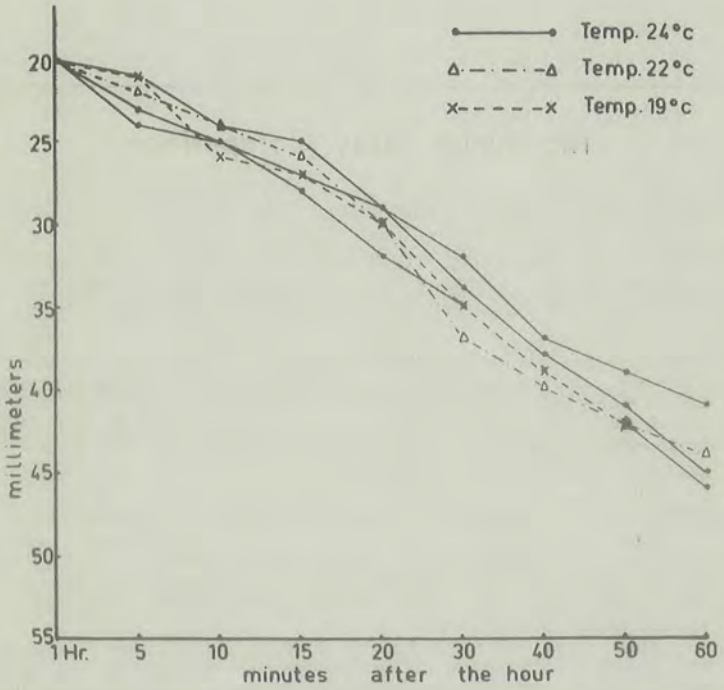

Figure 1. The above graph illustrates the rate of fall of ESRs in mm. at 5, 10, 15, 20, 30, 40, 50 and 60 minutes after the standard time of 1hr. Temperature alone does not influence the rate of fall of the ESR, as 24°C. lines indicate.

The phenomenon of erythrocyte sedimentation has been exhaustively investigated and many theories have been put forward to explain the mechanism. These theories may be obtained from the standard text books and from journal references. The above survey was not carried out with the intention of revealing anything new. The main reason for so doing was to establish some concrete figures to show the variation in the rate of fall of the ESR in the time elapsed after the standard time of one hour. In any laboratory method where standard techniques are advocated, if these are not adhered to, the test and the results become valueless. Our survey on ESRs has proved that.

Acknowledgments: The author is indebted to those trainees who conscientiously recorded these results.

The Junior Essay Competition

In accordance with Rule 27 of the N.Z.I.M.L.T. (Inc.), a prize of £5 5s 0d is awarded annually for the best entry in each of the two sections of the Junior Essay Competition.

TECHNICAL SECTION: Consisting of descriptions of methods or technical procedures, presented in the manner laid down in the "Directions for Contributors" appearing in each issue of the *Journal.*

ESSAY SECTION: Consisting of essays on historical, general or particular aspects of medical laboratory technology, presented in the style of an essay.

A cyclostyled sheet of instructions and suggestions for entrants is available on request, either from the Secretary of the Institute or from the Editor of the *Journal.*

Entrants must be members of the Institute and must be currently financial. They must not have passed the Certificate of Proficiency examination before the closing date for entries, nor must they be otherwise eligible for Associate membership.

Competitors should indicate for which section of the Competition they wish to enter, and should give their name and address on a separate sheet of paper.

Due regard will be paid in the judging to the mode of presentation, and the Council of the Institute reserves the right to withhold the awards in any year when no entry reaches a desirable standard.

Entries should be submitted to the Editor of the *Journal,* and should be posted in good time to ensure delivery in Dunedin before the closing date, June 4 1965. Entries arriving after this date will be disqualified.

A Further Note on the Concentration of Hydatid Hooklets

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(Received for publication September 1964)

In an earlier article[1] it was described how hydatid material, except for the hooklets, can be dissolved by immersion in concentrated hydrochloric acid and boiling if necessary.

A refinement of the method to remove fats was mentioned which has subsequently been found to be less satisfactory than the following method.

Method

To remove cholesterol crystals and fat globules, which are often present in old hydatid cysts and are a great hindrance to a successful microscopic search, proceed as follows:—

Having obtained the deposit of the whole concentrate in the bottom of a 10ml. centrifuge tube, add about 5ml. of tap water and re-suspend the deposit to wash out most of the acid. Centrifuge at 2,000 r.p.m. for a few minutes. Decant the supernatant, add 5ml. of ether and shake carefully for a few moments. Add 3ml. of tap water, shake, allow to settle, decant the ether and re-centrifuge as before. Decant the supernatant and make a wet film of the deposit. It will usually be found that this consists of little else but hooklets of *Echinococcus granulosus*, if these are present.

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The Estimation of 3 Methoxy — 4 Hydroxy — Mandelic Acid (MHMA) as an Aid to the Diagnosis of Phaeochromocytoma

M. R. FORD
Medical Unit Laboratory, Auckland Hospital

(Winner of the Auckland Hospital Board School of Medical Laboratory Technology Fourth-Year Thesis Prize, 1964.)

Phaeochromocytoma is a neoplasm of the chromaffin cells of the sympathetic nervous system, particularly those of the adrenal medulla.

Characteristically the tumour secretes adrenaline and noradrenaline, causing fluctuating or persistent hypertension. It is important to be able to diagnose this cause of hypertension because with removal of the tumour the hypertension is cured. The untreated tumour usually leads to death within a few years.

This condition is rare and no figures are available for the incidence of phaeochromocytoma in New Zealand. However, from October 1962 to November 1963, this hospital laboratory detected excess MHMA excretion in four out of 548 urines examined. All four positive tests were due to adrenal tumours verified by surgery or at autopsy.

Present laboratory methods of diagnosis depend on the measurement of catechol amines in urine. These methods are not specific, the substances measured are unstable and are present only in trace amounts. They are also subject to drug interference.

This paper presents the results of a study of a new method of diagnosing phaeochromocytoma by measuring 3 methoxy—4 hydroxy mandelic acid in urine.

Nomenclature

Because of a formal resemblance to vanillic acid and to mandelic acid, MHMA has also been called vanillyl mandelic acid. This name is not chemically correct and for abbreviation it is preferable to call this compound by its initials MHMA and not VMA as is the present practice in the United States.

Existing Methods

These methods have been either colorimetric, chromatographic or electrophoretic. Several of the colorimetric methods investigated proved to be non-specific because the reagent used, diazotised p-nitroaniline, reacts with a great number of compounds normally found in urine[1], so that results varied greatly according to the patient's diet.

A chromatographic method of estimating MHMA was then investigated[3]. The single extraction procedure allowed impurities to remain and the choice of solvent systems gave poor separation

of MHMA. The method also used diazotised p-nitroaniline as the developing reagent in the form of an aqueous spray. This caused a tendency for the spots to spread on the chromatogram before they could be dried off. Paper chromatography, however, seemed to offer the most promise as a specific, practicable and accurate method. It was therefore decided to investigate extracting procedures, various solvent systems and colour developing reagents.

Slight modification of an existing method for extracting phenolic acids from urine was used[1]. After experimenting with many combinations of solvents, an isopropanol-ammonia-water and a butanol-acetic acid-water mixture were found to be the most suitable for two-way chromatography. Gibb's reagent[2] (2:6 dichloro-quinone-chloro-imide) was tested for its colour development and proved to be superior to any other reagent.

Method of Extraction

1. Collect a 24-hour urine specimen and dilute a one-hundredth part to 20ml. with water in a stoppered tube (Quickfit 24/3/6). If urine volume is greater than 2 litres then only 20ml. of urine is taken.
2. Add 0.5ml. concentrated hydrochloric acid (check that pH is below 2 with indicator paper) and then shake with slight excess of sodium chloride (5-6g.). Place the tube in an ice-bath until thoroughly chilled.
3. Extract three times with 8ml. of ethyl acetate, centrifuge and combine extracts in another stoppered tube (Quickfit 24/2/6). Emulsion formation may be troublesome, especially during the first extraction. Vigorous shaking, therefore, is undesirable, though extraction should be thorough. If an emulsion does form, a few drops of ethanol with stirring and centrifuging usually breaks the emulsion.
4. Shake the combined ethyl acetate extracts twice with 1ml. portions of 10% sodium bicarbonate solution and after centrifuging remove the aqueous layers with a pasteur pipette and combine in another stoppered tube (Quickfit 24/1/6). This extraction into bicarbonate should be vigorous for three minutes.
5. Acidify the combined bicarbonate extract with concentrated hydrochloric acid (about 12 drops) to pH of less than 2. Add sufficient salt to saturate, shake, and again chill in an ice-bath. Finally extract three times with 1ml. of ethyl acetate, combine extracts in a small test tube and store at -20°C. Prepare a standard solution containing 1mg./ml. of 3 methoxy-4-hydroxy-mandelic acid in absolute alcohol. Add a few drops of concentrated

hydrochloric acid. This keeps indefinitely at -20°C. For use, dilute 0.18ml. of standard with 20ml. of water and extract as for urine.

Chromatographic Procedure

An aluminium frame holding 12 sheets of 20cm. x 20cm. Whatman No. 1 paper has been found most convenient.* This apparatus allows 12 ascending chromatograms to be run simultaneously.

Spot the extracts 1 inch from each of two edges of the paper. (A hair-dryer behind the paper speeds up this process.) Use 0.2ml. of extract measured with a micro pipette. Spots should not exceed 7mm. diameter.

The highest standard should be 6μg. of MHMA and this is obtained by spotting 0.1ml. of standard extract.

Other suitable standards are 1.5, 3.0 and 4.5μg. MHMA and these correspond to 0.025, 0.05 and 0.075ml. of standard extract respectively.

Two standards may be spotted on one paper at intervals of 2 inches along the perpendicular, but each urinary extract must be spotted on a separate piece of paper.

A two-way ascending technique is used, and the first solvent system is isopropanol-ammonia (S.G. 0.88)-water (8:1:1) overnight (12-15 hours). This over-running is essential for clean separation. Dry the papers in a current of cold air. The second solvent run is n-butanol-acetic acid-water (4:1:1). Allow the solvent front to reach about ½ an inch from the upper edge of the paper (3½-4 hours). Dry in a current of air and place in oven at 100°C. for 5-10 minutes. Mark the solvent front with a pencil; the front is easily visible as a fluorescent band when the paper is examined under ultra-violet light.

Colour Development

Spray with 0.1% solution of 2:6 dichloro-quinone-chloroimide freshly prepared in absolute alcohol. Dry papers carefully and then hold over ammonia vapour, preferably placed in an open petri dish in a fume cupboard. In a few seconds coloured spots begin to appear. Visual comparison is then made between the MHMA standard spots and the colour, size and density of the corresponding urinary extract spot having the same Rf as the standard applied from the same point on the paper.

Equally good results have been obtained with the chromatogram stapled in the form of a cylinder, run one way, restapled and run the second way. Comparison of spots greater than 6μg. can be quite erroneous and should not be attempted. Spots appearing to be greater than 6μg. in quantity should be re-run using 0.1 or 0.05ml. of extract.

**The Shandon. Available from Shandon Scientific Co., 6 Cromwell Place, London, S.W.7.*

With the above amounts a 4μg. spot is equivalent to 6mg. MHMA/day, and a 2μg. spot equivalent to 3mg. MHMA/day. Great care must be taken to ensure that the tank is airtight and is placed away from draughts or fluctuations in temperature.

Results

Urine specimens examined for MHMA content from 20 normal patients showed values ranging from 1.0 to 5.0mg./day (average 4.0mg.).

A further 30 specimens of urine were from patients with hypertension, many of whom were on drugs although none were on methyldopa *(Aldomet)*. The range in this group was from 1.5 to 6.5mg./day (average 4.0mg.).

Eight more specimens from patients with hypertension being treated with methyldopa were taken. The action of this drug is to prevent decarboxylation of dioxyphenylalanine (D.O.P.A.) to D.O.P.A.-amine thus preventing subsequent formation of noradrenaline. Values for patients on this drug were lower than normal. The range was from 0.5 to 3.0mg./day (average 2.0mg.).

A number of urines were studied from the four patients with phaeochromocytoma. The range of MHMA excretion was 30-120mg./day. A chromatogram from one of these patients is shown. (Plate 1.)

Discussion

During this study, over 500 two-way chromatograms have been examined and an adequate standard of accuracy and specificity has been achieved for measuring MHMA excretion. About a 15% loss occurs in the extraction procedure, so that a standard should be extracted with each batch. Extraction of the standard may be omitted if only a qualitative estimate of the amount present is required.

Experience of the method has shown that in nearly all cases MHMA can be detected immediately by its position on the chromatogram, being the blue spot which is nearly always to the extreme left of the others. The Rf of MHMA in *Ipram* is approximately 0.24 and in Butanol-acetic acid approximately 0.58.

The ingestion of methyldopa, which causes gross interference in the estimation of urinary catechols by fluorimetry, does not interfere with this method. Aspirin taken in sufficient quantities may cause the salicyluric acid spot (o-hydroxy hippuric acid, a major metabolite of salicylic acid in some patients) to be so large that it masks the MHMA spot, even though the Rf of the former is approximately 0.80 in butanol-acetic acid. No other drugs have been shown to interfere with this method.

The normal range of MHMA excretion by this method is 4.0$\pm$ 1.0mg./day. With a little experience a comparitive estimate against a known standard spot can be made with an accuracy of $\pm$15%.

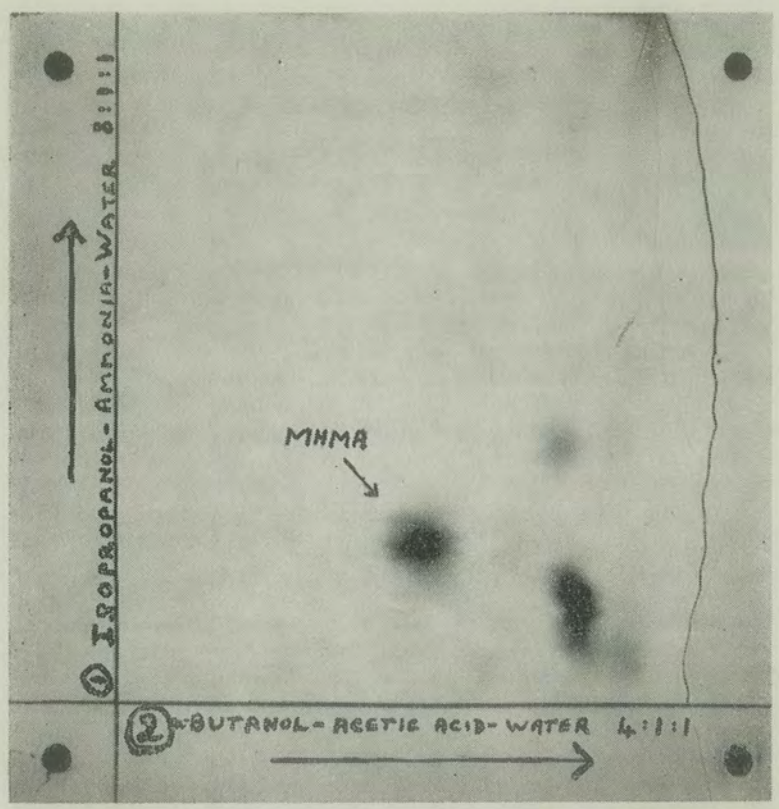

Plate 1. Illustrating the chromatographic separation of MHMA from a case of phaeochromocytoma.

Over the period when the catechol amine estimation and this MHMA method have been compared, neither has produced a false negative, although the catechol amine method has been subject to frequent interference by fluorescent products.

Summary

(i) A semi-quantitative method for 3 methoxy-4 hydroxy mandelic acid execretion in urine is described.

(ii) This method is not affected by diet or drugs.

(iii) The method is specific for 3 methoxy-4 hydroxy mandelic acid and has been very useful in the diagnosis of phaeochromocytoma.

Acknowledgment

I am indebted to Dr R. O. Farrelly for his most valuable advice and for reading this paper.

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1. Armstrong, M. D., Shaw, K. N. F. and Wall, P. E. (1956), *J. biol. Chem.*, **218**, 298.

2. Gibbs, H. D. (1927), *Ibid.*, **72**, 649.

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Selected Abstracts

Contributors to this issue: R. D. Allan, J. Case, J. E. Horner, H. C. W. Shott, D. Tingle.

BLOOD BANKING

Optimal Conditions for Detecting Blood Group Antibodies by the Antiglobulin Test. Hughes-Jones, N. C., Polley, M. J., Telford, R., Gardner, B. and Kleinschmidt, G. (1964), *Vox Sang. (Basel)*, **9**, 385.

By lowering the salt concentration of the suspending medium, the rate of antigen/antibody combination is increased, so that a considerable reduction in the incubation time of indirect antiglobulin tests is possible. An enhancement of titre was shown under these conditions against the antigens: A, c, D, e, M, K, Le^a, Fy^a, Jk^a.

The rationale of the prediction of optimum conditions for the detection of antibodies by the indirect antiglobulin technique is fully discussed.

Effect of Ionic Strength on the Serologic Behaviour of Red Cell Isoantibodies. Elliot, Margaret; Bossom, Edith; Dupuy, May Edith and Masouredis, S. P. (1964), *Vox Sang. (Basel)*, **9**, 415.

This paper, too, discusses the effect of lowering ionic strength on the serological behaviour of antibodies, both complete and incomplete. Some enhancement of activity was found with most antibodies, except for those with ABO and Lewis specificity.

The Presence of Anti-Jk^a in Association with Anti-c+E. Gohier, Micheline and Hayeur, Josee H. (1964), *Canad. J. med. Technol.*, **26**, 102.

This is an account of a case in which a patient suffers a haemolytic transfusion reaction seven days after the transfusion of three units of blood, administered during a hysterectomy operation. No serological incompatibility against the cells of the three donors was found in saline, albumin or by the indirect antiglobulin technique prior to transfusion, but when the cause of the patient's jaundice was investigated her serum was found to contain anti-Jk^a and anti-c+E.

The patient's history included two previous transfusions, one five and one seven years previously, four pregnancies and an injection of gamma globulin about six months earlier. Her husband was negative for c and E, but positive for Jk^a. Her fourth baby, born four months before the operation, developed unexplained neo-natal jaundice with a negative direct antiglobulin test.

It is suggested that the patient's serum probably contained latent antibodies which were not detectable at the time of the crossmatch, but which increased in strength after transfusion and caused a delayed reaction. The anti-c+E must have resulted from the previous transfusions, but the anti-Jk^a may have been due to incompatibility with the husband's blood.

The Effect of Storage of Whole Blood and Anticoagulants upon Certain Coagulation Factors. Goldstein, R., Bunker, J. P. and McGovern, J. J. (1964), *Ann. N.Y. Acad. Sci.*, **115**, 422.

During storage in ACD, the levels of factors V and VIII decrease gradually. Other coagulation factors are not significantly diminished during storage over a three week period. The decrease in activity of factors V and VIII is greater if EDTA is used as the anticoagulant. Plastic surfaces may have a deleterious effect on the platelets.

Alterations in Banked Blood with Special Reference to Hemostasis. Strumia, M. M. and Strumia, P. V. *Ann. N.Y. Acad. Sci.*, **115**, 443.

The significance of the duration of storage of blood used in massive transfusions is considered here, and certain recommendations are made.

A patient of good general health, whose liver and bone marrow are functioning well, should suffer no ill effects from being transfused with 10-15 units of blood. The administration of one relatively fresh unit of blood for every ten units of stored blood should meet the needs of his coagulation system.

A debilitated patient requires an evaluation of his haemostatic mechanism to ensure that his coagulation factors do not become depleted through the administration of large volumes of stored blood.

The collection of blood from donors should be carried out in such a way as to minimise platelet damage. Best platelet survival is achieved by storage in plastic bags. Most platelet damage occurs during vacuum collection.

Delayed Transfusion Reaction Caused by Anti-c and Anti-E. Jorgensen, J. R. (1964), *Dan. med. Bull.*, **11**, 165.

A patient received his first transfusion of blood in connection with an operation at the age of fifteen years. Twenty-two days later, he received another transfusion (of apparently compatible blood), which was stopped after the first 10ml. because the patient became dyspnoeic and cyanotic.

Five years afterwards, during cardiac surgery, a total of seventeen units of blood were administered. No demonstrable antibodies were present in the patient's serum, and the cells of all the donors were shown to be compatible.

After operation, increasing anaemia resulted in the need to administer further blood, and a total of three units, in plastic bags, were given on the 8-9th day after operation. On the ninth day, while attempting to match more blood, an incompatibility was detected, and the antibody was subsequently identified as anti-c+E. It was later discovered that two out of the three units administered on the 8-9th day were incompatible with the serum with which they had been originally crossmatched, but, significantly, the donor cells had now been taken from the main bag instead of from the plastic tube attached to the bag.

The author of this paper cites this as an example of an antibody developing during a series of transfusions and mentions the advisability of taking new samples for crossmatching at sufficiently frequent intervals. He also recommends that where the donor cell samples for the crossmatch are obtained from the plastic tube attached to a plastic bag, the tube should be squeezed empty and refilled from the contents of the main bag before sampling.

Retrospective Serologic Diagnosis of Haemolytic Transfusion Reaction. Yunis, E. J., Ziegler, N. and Benson, Sandra (1964), *J. Amer. med. Ass.*, **189**, 907.

The measurement of antibody titres at intervals, following a suspected incompatible blood transfusion, is offered as a useful method of demonstrating blood incompatibility in patients whose pretransfusion blood samples are not available.

This paper examines the cases of 14 patients who suffered haemolytic reactions and details the methods by which incompatibility was subsequently proven. Of the cases examined, seven were due to ABO incompatibility, one to a combination of ABO and rhesus incompatibility, one to anti-D alone and one each to anti-E, anti-Kell, anti-Kidd, anti-Duffy and anti-Cellano. In five cases there had been negligence in the proper identification of donor and recipient, in six there had been technical carelessness in failing to detect incompatibility and in one (anti-Kell) the antibody had been undetectable in the pretransfusion sample. This last indicates the need to rematch on fresh serum, at sufficiently frequent intervals, when blood is being held in reserve. These authors suggest that this should be done every twenty-four hours.

Isoimmunisation of a D^u Patient by Rh Positive Blood. Charpenning, F. W. (1964), *Milit. Med.*, **129**, 968.

This is a report of a case in which a child with the red cell reactions of a "high grade" D^u produced detectable levels of anti-D after being transfused with D-positive blood.

The Mechanism of the Effect of Iso- and Hyperosmolar Dextrose-Saline Solutions on *in Vivo* Survival of Human Erythrocytes. DeCesare, W. R., Bove, J. R. and Ebaugh, F. G. Jnr. (1964), *Transfusion (Philad.)*, **4**, 237.

This study was undertaken after several intravascular haemolytic transfusion reactions had been traced to the administration of a blood transfusion through a secondary transfusion set containing 5% glucose in quarter-strength saline. The gradual entry of glucose into the red cells causes swelling to a critical volume because water also has to enter to maintain the equality of the osmolarity inside the red cell with that in the suspending fluid. When red cells thus swollen are abruptly introduced into the iso-osmotic, low dextrose environment of human plasma in the patient's circulation, haemolysis occurs due to the entry of further water to achieve osmotic equilibrium.

Effect of Storage up to 48 Hours on Response to Transfusions of Platelet-Rich Plasma. Levin, R. H. and Freireich, E. J. (1964), *Transfusion (Philad.)*, **4**, 251.

By measuring the platelet increment in thrombocytopenic patients after the transfusion of fresh and stored platelet-rich plasma, it has been shown that platelets stored for 24 hours are only 62% as effective as fresh platelets.

A Simple Method of Preparing "Coated" Red Blood Cells for Use as a Control in Antiglobulin Testing. Fresco, R.; Busch, Shirley; Hanson, Mary Lu and Huestis, D. W. (1964), *Transfusion (Philad.)*, **4**, 262.

For the benefit of the person who thinks that "any fool can make up a Coombs control," it should be remarked that this paper is worth reading. The advantage of the method described is that it is possible to prepare a weak control by sensitising cells with strong antibodies and resuspending them, after washing, in diluted AB serum. The purpose of the trace of AB serum in the sensitised cell suspension is the partial neutralisation of the anti-globulin reagent, so that a predictably weak degree of agglutination can be achieved. The correct dilution of AB serum is determined by a simple titration.

It is also pointed out that the only way to control antiglobulin tests effectively is to add positive control cells to all observed negative anti-globulin reactions. If the procedure has been properly carried out, free antiglobulin remains in the mixtures after a negative reaction. This can be detected by the addition of positive control cells, and if agglutination does not take place it means that there has been neutralisation of the anti-globulin reagent owing to some error of technique.

A Methanol-Polymer Solution for Protection of Erythrocytes at Sub-Zero Temperatures. Kilman, A. (1964), *Transfusion (Philad.)*, **4**, 281.

By adding to one part of washed red cells four parts of 10% poly-vinylpyrrolidone in 30% methanol, storage is possible in a liquid state at —20°C. There is minimal haemolysis, and recovery is much simpler than is the case after storage in glycerol. Antigenic strength of the cells is unimpaired after one month's storage under these conditions, except in the case of the $Lewis^a$ character which is completely lost. (Kell does not seem to have been tested for.)

A Fatal Hemolytic Transfusion Reaction with Acute Autohemolysis. Polesky, H. F. and Bove, J. R. (1964), *Transfusion (Philad.)*, **4**, 285.

A woman with acute leukaemia suffered a fatal haemolytic trans-

fusion reaction due to the Kidd antibody anti-Jk^a. Radioactive chromium studies showed that a severe auto-haemolytic episode was associated with the reaction. The possible reasons why the transfusion of incompatible blood might initiate an acute auto-haemolytic crisis are discussed, and the hazard that non-specific agglutinins may mask the presence of specific iso-antibodies is again mentioned.

A Two-Stage Antiglobulin Test for the Detection of ABO Hemolytic Disease of the Newborn. Cohen, I and Nelken, D. (1964), *Transfusion (Philad.)*, **4**, 343.

A two-stage antiglobulin test using rabbit anti-human and hen anti-rabbit serum is described. The test gives positive results in ABO haemolytic disease.

Blood Groups of Human Red Cells after Two Years' Storage in Liquid Nitrogen. Huntsman, R. G., Hurn, B. A. L., Ikin, Elizabeth W., Lehmann, H. and Liddell, J. (1964), *Transfusion (Philad.)*, **4**, 354.

After storage for two years in liquid nitrogen, haemolysis is still minimal, but progressive haemolysis of the thawed cell suspensions is increased. The blood grouping properties of the recovered cells are satisfactory.

Delayed Hemolytic Transfusion Reaction Due to Appearance of Multiple Antibodies Following Transfusion of Apparently Compatible Blood. Joseph, J. I.; Awer, Erika; Laulicht, Martine and Skudder, J. (1964), *Transfusion (Philad.)*, **4**, 367.

This is another example of a delayed transfusion reaction (occurring seven days after transfusion) in which the crossmatch failed to reveal any incompatibility before transfusion. The antibodies causing the reaction, which was characterised by jaundice, haemolysis and haemoglobinuria, were anti-c, anti-E, and anti-Jk^b.

An *In Vivo* Crossmatching Procedure for Selected Problem Cases in Blood Banking. Walford, R. L. and Taylor, Pat (1964), *Transfusion (Philad.)*, **4**, 372.

In cases where the presence of auto-antibodies invalidates the conventional *in vitro* crossmatching procedure, also in cases where there is a history of haemolysis following transfusion but no detectable antibodies in the patient's serum, this procedure is suggested as a means of determining compatibility.

50 ml. of blood from a particular donor unit is administered, and the patient's serum is then examined for an increase in the bilirubin level after four hours. A rise of less than 0.5 mg. per ml. is considered to be evidence of compatibility.

The Problem Crossmatch. Stern, K. (1964), *Transfusion (Philad.)*, **4**, 375.

Professor Stern's advice on what to do when confronted with an unexpected incompatibility between the serum of a patient and the cells of a prospective donor will be useful in determining the solution to such a problem. Possible causes, sources of error and factors simulating incompatibility are detailed, and procedures are suggested that may assist the blood bank worker in finding compatible blood.

Risk of Post-Transfusion Viral Hepatitis. Grady, G. F., Chalmers, J. C. and the Boston Inter-Hospital Liver Group (1964), *New Engl. J. Med.*, **271**, 337.

Hepatitis followed transfusion in one case for every 1,775 units of blood used over an eleven month period at nine Boston teaching hospitals. (Not all patients were available for post-transfusion follow-up.)

The incubation period ranged from 21 to 180 days, with the greatest incidence in the 30-60 day period. The mortality rate was 12%.

The Preservation and Storage of Red Cells for Subsequent Use in Antibody Detection Procedures. Roy, R. B. and Wyatt, Louise (1964), *Transfusion (Philad.)*, **4**, 293.

The cells for preservation are collected into modified Alsever's solution containing the antibiotic cycloheximide. The red cell/preservative solution mixture is dispensed in small aliquots and stored undisturbed at +4°C., each sample tube of cells being used once only and then discarded. There was negligible deterioration of a few antigens after 8 weeks storage, and the preserved cells seemed to be perfectly reliable as a source of antigen for use in antibody detection procedures, although possibly not suitable for the titration of antibody.

CHEMICAL PATHOLOGY

A Review of Simple Chemical Screening Tests. Campbell, C. K. (1964), *Gaz. Inst. med. Lab. Technol.*, **8**, 234.

This short article explains the chemical principles of the well-known proprietary analytical reagents for urine testing, marketed by the Ames Company Division of Miles Laboratories Ltd.

A New Method for the Detection of Galactosemia and Its Carrier State. Beutler, E., Baluda, M., and Donnell, G. N., (1964), *J. Lab. clin. Med.* **64**, 694.

A dye linked visual screening test for the estimation of galactose-1-phosphate uridyl transferase. The end point is the reduction of methylene blue to its leucoform. R.D.A.

Occult Blood in Faeces: Assessment of Routine Tests. Ross, G., Gray, C. H., De Silva, S., and Newman, J., (1964), *Brit. med. J.* **i**, 1351.

When equivocal results are obtained from clinical, radiological and endoscopic examination, a positive result with a relatively insensitive test suggests bleeding, a negative result with a more sensitive test suggests absence of bleeding. However, false positives occur with the former and false negatives with the latter. "It is questionable whether the chemical test for occult blood should be retained."

^{51}Cr method eliminates these difficulties but is hardly suitable for routine use. R.D.A.

Specific Uric Acid Estimation by the Carbonate Method Without the Use of Uricase. Eichhorn, F. and Rutenberg, A., (1963), *New Istanbul Contr. clin. Sci.*, **6**, 87.

Non specific reducing substance such as tyrosine tryptophane cystine glucose glutathione and ergothioneine are destroyed by incubation for 90 minutes at 56°C or by 3 days' storage in the refrigerator prior to estimation. Excellent correlation with uricase technique. R.D.A.

The Usefulness of Serum Trypsin Tests. Roman, W. and Fauilla, I., (1963), *Enzymol.*, **26**, 249.

Four synthetic peptides for trypsin assay were tested; 3 were extremely sensitive. However, in human serum of normal subjects and patients with acute pancreatitis, no trypsin could be detected with these reagents due to the presence of inhibitors. R.D.A.

HAEMATOLOGY

The Partial Thromboplastin Test. Djerassi, I. (1964), *Ann. N.Y. Acad. Sci.*, **115**, 270.

This short paper calls attention to the limitations of the estimation of bleeding, clotting and one stage prothrombin times in the overall evaluation of haemostasis. The partial thromboplastin test is commended as a simple and reliable screening procedure.

Microbiological Assay of Folic Acid Activity in Human Serum. Spray, G. H. (1964), *J. clin. Path.*, **17**, 660.

A method is described for the microbiological assay of folic acid activity in serum with *Lactobacillus casei* as test organism and a modified medium in which the organism gives a greater growth response than in media previously detailed. The results of experiments carried out to validate the use of this medium are shown.

Quality Control of Determination of Prothrombin Time. Brooks, R. A. and Copeland, B. C. (1964), *Amer. J. clin. Path.*, **42**, 221.

This paper examines the control of prothrombin time determination, using fresh normal plasma and freeze-dried plasma normal controls.

Significant differences between dilution curves were found, leading to a recommendation that the expression of results as a percentage of normal is unreliable.

Both fresh and freeze-dried plasma controls yielded reproducible values over the period of study, but although there was stability up to 90 minutes, activation occurred within three hours in both.

HISTOPATHOLOGY

The Special Value of Methods that Colour both Acidic and Vicinal Hydroxyl Groups in the Histochemical Study of Mucins with Revised Directions for the Colloidal Iron Stain, the Use of Alcian Blue G8X and their Combinations with the Periodic Acid-Schiff Reaction. Mowry, R. W. (1963), *Ann. N.Y. Acad. Sci.*, **106**, 402.

The development and technical directions are given for the colloidal iron method and alcian blue stain as used for the demonstration of complex carbohydrates with free acidic groups. Examples of acidic carbohydrates are mucins of nearly all goblet cells, mucins of nearly all epithelial neoplasms and mucins of connective tissues and their tumours. Directions are given for combining the colloidal iron method with the PAS method, and combining the alcian blue method with the PAS method in order to demonstrate, in one section, acidic carbohydrates and neutral carbohydrates rich in vicinal hydroxyl groups. The article also includes a resume of the histochemical properties of epithelial and connective tissue mucins. D.T.

A Selective Stain for Renal Basement Membranes, Puchtler, M. and Sweat, F. (1964), *Stain Tech.*, **39**, 163.

Tissues are fixed in Carnoy's Fluid, No. 2. Sections are treated with periodic acid for five minutes, then placed in sodium bisulphite overnight. They are then stained in resorcin-fuchsin solution for four hours, counterstained and mounted in synthetic resin. Basement membranes are coloured black to dark grey. In formalin-fixed tissue, reticulin and collagen fibres are also stained, and in Zenker-formol fixed material all tissue components are intensely coloured. The authors found the method useful for the study of glomerular lesions for projection and colour photography. D.T.

MICROBIOLOGY

Experimental Transmission of *Salmonella typhimurium* by Houseflies to Man. Greenberg, B. (1964), *Amer. J. Hyg.*, **80**, 157.

Experimental transmission of *Salmonella typhimurium* from infected dogs to human volunteers has been described. Quantitation of the organism in the dog faeces, houseflies and food has provided useful Public Health data, with emphasis on the sporadic contamination of food to a level capable of causing widespread infection. H.C.W.S.

Survival of *Staphylococcus aureus* in the Environment. McDade, J. J. and Hall, L. B. (1964), *Amer. J. Hyg.*, **80**, 184.

Survival rates have been determined for three strains of *Staphylococcus aureus*, which have been experimentally exposed on surfaces similar to those found within institutions. The authors have made a realistic approach to the problems relating to the reduction of surface contamination. H.C.W.S.

The *In Vitro* Reduction in Viscosity of Human Tracheo-Bronchial Secretions by Acetylcysteine. Sheffner, A. L., Medler, E. M., Jacobs, L. W. and Sarett, H. P. (1964), *Amer. Rev. resp. Dis.*, **90**, 721.

Apart from any value in clinical medicine, it is of special interest to the microbiologist that acetylcysteine rapidly liquifies sputum for bacterio-

logical examination. The use of this reagent may well coincide with further attempts to enumerate the pathogenic and non-pathogenic bacteria associated with chest infections. H.C.W.S.

The Routine Antibiotic Disc-Plate Sensitivity Test. Barry, A. L. (1964), *Amer. J. med. Technol.*, **30**, 333.

The author continues a series dealing with the technical problems encountered when performing routine sensitivity tests. Observations on this occasion are confined to technological variations, and everyone should be reminded by reading this article that the reliability of results is very limited unless strict attention is paid to standard methods. H.C.W.S.

The History and Development of Antibacterial Chemotherapy. Waterworth, Pamela M. (1964), *J. med. Lab. Tech.*, **21**, 310.

Not by any means an historical document, this review article is, nevertheless, well worth reading by those who have any connection with the problems of systemic chemotherapy. Miss Waterworth covers her field with a background of sound commonsense, and does a great deal to relate the present-day position to the very limited experience to hand. H.C.W.S.

The Group D Streptococci. Deibel, R. H. (1964), *Bact. Rev.*, **28**, 330.

Reference is made to the species' distribution in humans, domestic and wild animals, also insects, plants and soil. About a third of this article is devoted to "Public Health Significance," dealing in particular with food poisoning, and the usefulness of Group D Streptococci as indicators of faecal contamination. H.C.W.S.

Evaluation of the Efficiency of Four Different Types of Swabs in the Recovery of Group A Streptococci. Hosty, T. S. Johnson, Mary B., Gaddy, R. E. and Hunter, F. R. (1964), *Health Lab. Sci.*, **1**, 163.

Dacron swabs, transported in the presence of silica gel desiccant, permitted excellent recovery of Group A streptococci from throat swabbings cultured 72 hours after collection. It is apparent that this type of swab is worth consideration when large numbers of patients have to be screened to exclude carriers. H.C.W.S.

Pulmonary Disease Due to Unclassified Mycobacteria (Battey Type). Smyth, J. T., Kovacs, K. and Harris, W. P. (1964), *Tubercle (Lond.)*, **45**, 223.

Pulmonary disease due to anonymous mycobacteria (Battey Type) occurs in Western Australia. Some details of fourteen patients are presented. The distinctive bacteriological features of the Battey-type mycobacteria are described. H.C.W.S.

Bacteriological Tests for Urinary Infections. Markham, N. P. and Shott, H. C. W. (1964), *N.Z. med. J.*, **63**, 511.

Now that the enumeration of viable bacteria in suitably-collected, mid-stream specimens of urine has become a recognised useful clinical procedure, technologists throughout the country are interested in a simple and reliable technique of urine collection and culture.

This paper discusses these problems. Three methods for the estimation of viable organisms in patient's urine are presented and compared. Two of these methods appear useful and simple, and within the scope of all laboratories. J.E.H.

***Candida Albicans* in a Maternity Hospital.** Somerville, Dorothy A. (1964), *N.Z. med. J.*, **63**, 592.

An investigation into the incidence, distribution and transmission of *Candida albicans* in a maternity hospital is described. A high incidence of vaginal carriage in pregnancy was obtained (40%), and there was a large decrease in the incidence post-natally when (9.6%) of mothers carried the organism. Infants were found to be carrying *C.albicans*, either in the mouth or stool, or in both when in hospital. The possible significance of these and other findings is discussed. H.C.W.S.

Book Reviews

Clinical Interpretation of Laboratory Tests, 5th Edition. R. H. Goodale, M.D., Blackwell, Oxford, 1964. 785 pages, 109 illustrations (6 in colour).

Here is a book that approaches laboratory techniques from a different angle. In Part I, the physiological significance of normal and abnormal values in blood and body fluids are dealt with, while in Part II, under the headings of different diseases, are listed the associated laboratory findings.

There is a chapter on collection and care of laboratory specimens (which is rather quaint for its omission of any mention of EDTA anti-coagulant) and on blood groups which scarcely scratches the surface of the subject and is illustrated with a number of drawings which are distinctly reminiscent of the books by which infant children are taught to read. These serve no useful purpose at all and could very well have been left out. Not that all the illustrations are without value; many of them are quite good, although in the one depicting red cells from pernicious anaemia, iron deficiency and normal side by side, there is a misleading mistake in the caption. The sections on haemorrhagic diseases is rather cursory and contains one or two statements that could be misleading (for instance one is led to believe that all cases of classical haemophilia will have greatly prolonged clotting times).

This is a work of reference which may be of some value to the trainee and his tutor in that it gives explanations that will not be found in most laboratory textbooks, but there is the inevitable loss of detail resulting from the attempt to cover such a wide field. One has the feeling that the book will be much more useful to the clinician than to the laboratory worker, even though its author, a pathologist, intends it to appeal to both. J.C.

Haematological Technique. Third Edition. E. M. Darmady, M.A., M.D., F.R.C.P. and S.G.T. Davenport, F.I.M.L.T. J. & A. Churchill, London, 1963. 263 pages, 4 coloured plates, 22 text figures. Price in U.K., 30s.

This edition has been enlarged to include a number of recently introduced techniques, such as Vitamin B_{12} levels, alkaline phosphate activity etc.

Unfortunately this process has not been carried far enough. Many of the older and inaccurate methods of haemoglobin estimation remain, and there is no mention of the cyanmethaemoglobin technique. The figure of 14.8g/100 ml. is given as 100% Haldane, in spite of the fact that this is no longer generally accepted.

The chapters on haemolytic anaemias, leukaemia and coagulation defects are generally complete and correct, but the techniques given are often inadequate and incorrect. In the thromboplastin screening test, the $CaCl_2$ is added to the incubation mixture at 1 minute intervals. There are also far too many proof reading errors.

It is a pity that the authors prefer the older reagents and techniques: Heller and Paul's mixture to EDTA, and Wintrobe's ESR to the Westergren method — while no mention is made of the microhaematocrit or the electronic cell counter using the 'conductivity' principle.

The section on blood group serology tends to be incomplete and misleading. The Kell group is shown as a simple Kk system, while the P groups are included under the MNS heading. It is also stated that the complete ABO genotype can be determined with the use of anti-O found in some A_1 and A_1B people. An indirect Coombs crossmatch is recommended only for patients with a history of previous transfusions or pregnancies, when today's standard procedure is to include this for all compatability tests.

The substitution of photomicrographs for the colour plates would do much to ease the recognition of the various cell precursors and abnormalities.

There is a useful glossary of terms included at the end of the book, and also a guide to further reading that one would do well to make use of.

The book may well be of use to the trainee technologist studying for the Intermediate examinations, but the Final candidate would need to rely on more detailed and standard works.

D.S.F.

Handbook of Histopathological Techniques, Second Edition, C. F. A. Culling, F.I.M.L.T., F.R.M.S. Butterworths, London, 1963. 553 pages. Local price, 84s 0d.

There are very few books on histopathological technique written by technologists, and when the first edition of this one appeared the impact was considerable. The advice and methods given can be followed, knowing that they have been used by the author, and are not a conglomeration of untried ideas gleaned from dubious sources.

The second edition, like the first, covers the use of fixatives and routine processing to paraffin wax, but, in addition, describes some quite recent innovations in embedding materials and technique. Now that many histology laboratories use mechanical processing and knife sharpening devices, it is pleasing to find these described. Histochemistry is such an expanding field that the technologist should now have an understanding of the principles involved, and a knowledge of the cryostat which has made much of the expansion possible. The author offers a reasonable introduction to the subject but does not get involved in chemical theory, which would be out of place in a book of this nature. The P.A.S. reaction and its position in the field of carbohydrate demonstration is better described than in the earlier edition, but the use of sulphite rinses is still given in the recommended technique and this would seem unnecessary.

Expanded chapters on fluorescent staining, cytology and electron microscopy acknowledge the increasing importance of these fields, without pretending to be suitable texts for the specialist.

The section on microscopy includes phase contrast, interference and dark ground principles, which are explained in a manner suitable for the trained technologist in any field.

Despite the small sections of the book which will be seldom used in the routine laboratory, this is a volume which is likely to spend more time on the laboratory bench than on the shelf.

B. G-J.

Practical Haematology, Third Edition. J. V. Dacie, M.D. (Lond.), F.R.C.P. (Lond.) and S. M. Lewis, B.Sc., M.D. (Capetown), D.C.P. (Lond.). J. & A. Churchill, London, 1963. 435 pages, 90 illustrations. Price in U.K., 40s.

The title of this excellent book will be familiar to almost everyone; and in this new edition, in which Professor Dacie is joined in co-authorship by Dr S. M. Lewis, all will find a book which is as indispensable in a haematology laboratory as counting chambers.

The text has been expanded to embrace such subjects as erythrokinetics and the use of radioactive isotopes; and it has, in many places, been extensively rewritten to bring it up to date. There is more about the principles of electronic particle counting, more about cytochemical techniques and much more about tests for the investigation of coagulation disorders. The more modern methods used in the investigation of megaloblastic anaemias are described in detail, as are those for the estimation of haptoglobins and the detection of deficiencies of red cell enzymes. Tests

for leucocyte and platelet antibodies are included, and so are the newer methods of controlling anticoagulant therapy.

The chapter on blood groups is poor by comparison with the rest of the book, and one has the feeling that the authors would have done best to have left these matters to those who have specialised more particularly in this field. Notwithstanding this one shortcoming, however, this is a book which every trainee technologist ought to own, and it is one which no haematology technologist can afford to be without. J.C.

Practical Section Cutting and Staining, Fourth Edition. E. C. Clayden, F.I.M.L.T. J. and A. Churchill, London, 1962; 198 Pages, 31 illustrations. Price in U.K., 20s.

This pocket-sized book is written for technicians with little or no experience of preparing routine histological sections. Fixation, dehydration, clearing and embedding are explained simply but thoroughly, along with advantages and disadvantages of the various reagents used. Manual and automatic tissue processing and knife-sharpening techniques are described. Section cutting with the Cambridge, rotary and sledge microtomes is described in minute detail.

At least one method is given to demonstrate the tissue components and pigments which one meets in a routine hospital laboratory. A small section of the book deals with the preparation of frozen sections for urgent diagnosis and silver techniques, and another section deals with celloidin material.

One may argue the merits or otherwise of the staining methods, and the method of preparation of the rapid frozen sections seems a bit long-winded but, as a practical introduction to basic histological techniques, this book has a lot to recommend it. D.T.

Techniques in Chemical Pathology. G. A. Cheyne, F.I.M.L.T. Blackwell, Oxford, 1964. 397 pages. Price in U.K., 42s.

The aim of this book is stated to be that of guiding medical laboratory technicians through the examinations of the British Institute of Medical Laboratory Technology and providing a practical laboratory guide to the handling and analysis of biological samples.

The plan is to provide a refresher course in basic chemical procedures (six chapters are devoted to this), and then to lead on to laboratory practice. This is a brave attempt, but I feel that if one was not already acquainted with the necessary basic chemistry the concept of valency, atomic structure and gas laws would be more easily grasped from the standard works. For revision, too, I think that this is also true. It does, however, underline the need for such a background which would logically proceed through organic chemistry to the elements of physiological chemistry. However, many practical aspects are admirably dealt with: filtration and sintered glass filters, electrophoresis and chromatography, and particularly the preparation of chromatography columns. Thin layer preparations are not alluded to and one gains the impression that familiar topics are favoured. A good deal of valuable information is given on the subject of radio-isotopes and their practical handling.

I did not really consider that instrumentation was adequately dealt with, colorimeters and spectrophotometers are fundamental tools in Chemical Pathology and call for more than the superficial treatment accorded them in little more than three pages. No allusion is made to the exponential natures of light absorption, which would have been apparent from the mathematical expression of optical density. Such expressions as specific extinction and transmittance should be mentioned and defined. Types of filters and of colorimetric apparatus are also required knowledge. In contrast the polarograph, gas analysis apparatus, potentiometric titration and pH meter receive quite extensive treatment.

One surprising omission is that of automative apparatus. In Britain there are enormous numbers of autoanalysers and this fact is reflected in the examination questions. It is no exaggeration to say that such machines completely alter the laboratory routine and the methods employed. As they may cope with two-thirds or more of the total work output they surely rate a chapter.

Quite a lot of time and energy is spent nowadays in organising of control procedures to ensure that the results of analytical techniques can be regarded in perspective. This involves statistical analysis and the establishment of confidence limits. This topic, too, is deserving of mention in a textbook of this nature.

The renal system is covered adequately in the main, the qualitative urine tests include all the old favourites. One might have hoped for some indication of relative value and importance; for example, cystine crystals compared with indican. The advantages of paper chromotography for identifying reducing substances in urines could have been alluded to here. The frequency of porphyrins seem to justify a quantitative technique — or at least an adequate screening technique, and screens for phaeochromocytoma might also have been included. The renal function tests are given in detail and include techniques for G.F.R., E.R.P.F., and filtration factor. The enzyme chapters describe transaminase, lactic dehydrogenase, serum glucose 6-phosphate dehydrogenase, and phosphoglucose isomerase. The second last one is suggested as an alternative to transaminase for myocardical infarction. It has, of course, been more commonly employed in the detection of von Gierkes's glycogen storage disease and, in the red cell haemolysate, for certain of the congential non-spherocytic haemolytic anaemias. A novel method for pepsin using the conversion of edestin to edeston, visualised by the relative degree of opalescence with sodium chloride is described. The method for tryptic activity uses x-ray film, the solubility of which varies with age. There is a simple alternative using gelatine solution which might have been mentioned. Brief chapters on liver function tests, vitamins, calcium and phosphorus, and nitrogen metabolism follow, and in general little choice of method is given. This is possibly necessary to keep the size of the book within bounds. Nevertheless, for a book which purports to be an examination textbook, this is unfortunate. The dual aims of this publication may not be quite compatible. Incidentally there are a number of typographical errors; a misplaced O in role in the introduction; we are enjoined, on P.215, to give 700 mg. of vitamin C per stone of body weight (this should of course be 70mg.); and chapter 15 is headed Calcium and Phosphor*as* in Serum. A thorough explanation of the practical details involved in metabolic balance experiments is given with the estimation of nitrogen calcium and phosphorus in urine, faeces and food. Basal Metabolic Rate by open and closed circuits methods are described, the latter in detail. P.B.I. estimation is also described in this chapter, the wet digestion method of Farrel and Richmond being favoured. Glucose metabolism, serum iron, gastric function and C.S.F. are treated fairly briefly and again, selectively. Hormones in urine receive a fuller treatment and methods are given for 17 ketosteroids Norymberski's bismuthate method for 17 ketogenic steroids, oestrogens, preganediol, and pregnanetriol. The chapter on acid base metabolism describes the macro-Astrup apparatus and techniques in some detail. Under special techniques there is a useful mixed bag of methods, namely estimation of body water, the total by deuterium or heavy water dilution technique measured by the time taken to fall through O-fluorotoluene, and electrophoretic techniques for folic acid deficiency (FIGLO), calculus analysis, determination of various toxic substances and analysis of milk and water.

R.D.A.

Virological Technique. D. W. G. Busby, A.I.S.T., W. House, F.I.M.L.T. and J. R. Macdonald, F.I.M.L.T. J. A. Churchill, London, 1964. 218 Pages, 38 illustrations. Price in U.K. 30s 0d.

Until now, virological techniques have been dealt with either by a series of authors each describing the diagnostic methods applicable to a particular disease, or in one or two introductory chapters in expensive text books. This is the first time that an attempt has been made to compile an up-to-date text book which includes all the methods used routinely in medical virology.

In general, it is an excellent little book in which the authors have achieved their object. From the number of details, which may be thought trivial but which experience teaches are important, it is obvious that the authors have had a lot of experience in the techniques they describe. Where methods are not described in detail, reference is made to standard texts.

An early chapter is devoted to the preparation, cleaning and sterilising of apparatus. Then follow chapters on laboratory apparatus and microscopy, describing the specialised equipment and techniques used in a virological laboratory.

The section on animal procedures covers all aspects from housing through inoculation, bleeding, and anaesthesia, to post mortems. A particularly valuable table lists the anaesthetics suitable for different animal species. The chapter on the use of the embryonated egg describes methods of inoculation and harvesting the fluids and tissues.

Four chapters devoted to different aspects of tissue culture deal with media, tissues used, and the various methods of culture. A chapter on serology describes in detail the complement fixation, haemagglutination, and neutralisation tests, and makes passing references to precipitation and gel diffusion. Unfortunately the standard volume used in the complement fixation test is omitted early in the description.

The chapter on systematic virology falls short of the standard set by earlier chapters. The misuse of words (*refractive* for *refractory; citicine* for *psittacine*), the mis-spelling of names in reference lists, and the casual mention of such things as receptor gradients and O-D variation in myxoviruses without explanation can do nothing but confuse the beginner in virology. This chapter could be an asset to the book if it was rewritten clearly and concisely.

Despite this criticism, this book is the only one in the field which deals with animal, egg, tissue culture and serological techniques in adequate detail. While it is not a 'teach yourself' book to be used alone, it is well worthy of consideration by those technologists engaged in medical or veterinary virology. F.J.A.

Changes of Address

Members of the Institute and subscribers to the JOURNAL are asked to ensure minimal misdirection of correspondence by notifying any changes of addresses promptly to the Editor.

In the case of members, such notification will automatically ensure the registration of their new addresses in the official records of the Institute.

The Health Department Examinations

FINAL — CERTIFICATE OF PROFICIENCY (October 1964)

Written Paper (Bacteriology)

Answer all questions. *Time allowed 3 hours.*

1. What diagnostic skin tests are performed in a microbiology department? State very briefly how each test is performed and explain the principles underlying each test. *(15 marks)*

2. Describe the Neisseria group of organisms and the method used in their identification. *(20 marks)*

3. Write an essay, based on your observations as a medical laboratory technologist, on the dangers of the indiscriminate use of antibiotics. *(15 marks)*

4. A patient is suspected of having amoebic dysentery. What instructions would you give on the collection of specimens for parasitological examination, and what methods would you adopt in that examination? What are the distinguishing characteristics of the causative organism in amoebiasis? *(18 marks)*

5. Write brief notes on:

(a) The Arizona group of organisms; (b) Sterilization by formalin vapour; (c) *Bacteroides* genus; (d) Identification of *Cryptococcus neoformans;* (e) Membrane filters; (f) Isolation of *Cl. tetani* from soil; (g) The principles involved in the titration of A.S.T.O.; (h) Preparation of slopes of Lowenstein-Jensen medium.

Written Paper (Biochemistry)

Answer all questions, which carry equal marks. *Time allowed 3 hours.*

1 (a) Describe briefly the nature and origin of bilirubin in human blood.

(b) Write short notes on the methods of estimating bilirubin in serum, including the advantages and disadvantages of the methods you describe.

(c) What is the normal range for serum bilirubin and what, briefly, are the causes of a raised value.

2. Write short notes on protein precipitants in current use in chemical pathology. What are the advantages and disadvantages of the methods you describe?

3. What do you know of the construction of the spectrophotometer? With diagrams, explain the principles of operation of one such instrument.

4. Describe briefly the methods of which you are aware for the estimation of serum or plasma proteins including A/G ratio.

5. Write brief notes on any five of the following:

(a) Molar and molal solutions; (b) Milliequivalents; (c) Spectral absorption band; (d) Reducing substances in urine; (e) Quantitative urobilinogen estimation in urine; (f) Folin and Cioacalteu Reagent; (g) Sulphaemoglobin and methaemoglobin; (h) The estimation of faecal fat; (i) Urinary coproporphyrin.

Written Paper (Haematology)

Answer all questions, each carries equal marks. *Time allowed 3 hours.*

1. What changes are found in the peripheral blood in iron deficiency anaemia? Define all the descriptive terms used.

What other laboratory procedures can assist in confirming or elucidating this diagnosis? (Techniques not required, but indicate clearly what information is sought from each test mentioned.)

2. Write notes on:

(a) Quality control for haemoglobinometry; (b) Westergren sedimentation rate; (c) Normoblast; (d) Sources of error in Quick's one stage prothrombin time.

3. Write a review of the haematological findings in any case of leukaemia you have studied personally. Clinical details not required except insofar as they account for fluctuations in the haematological picture.

4. Draft a set of instructions for laboratory staff to cover collection and labelling of specimens for blood grouping and crossmatching.

5. (a) Outline one method of preparation of Coombs' reagent (antihuman globulin); (b) Who was Coombs? (c) How would you check a batch of Coombs' reagent which might have been affected by a storage accident? (d) List possible causes of false positive Coombs' reactions.

6. Discuss the laboratory diagnosis of ABO haemolytic disease of the newborn.

Practical Paper (Bacteriology)

Attempt all questions. *Time allowed 3 hours.*

1. Broth culture A is that of a *Staphylococcus aureus* recovered from the blood of a patient suffering from septicaemia. Determine its sensitivity to penicillin by the tube method. It is known that the inhibitory concentration lies within the range 5-0.15μg. penicillin per ml. You are supplied with the following material:—

(a) penicillin containing .....μg. per ml. (b) sterile graduated 0.1, 1.0 and 10 ml. pipettes; (c) sterile 100 ml. volumetric flask; (d) sterile distilled water and nutrient broth; (e) sterile universal (1oz.) containers; (f) sterile pasteur pipettes; (g) control organism B which is inhibited by 0.15μg. penicillin per ml.

You may use the method of your choice, giving full details of the procedure you have followed, or base your method on the following procedure:—

(a) Dilute the penicillin solution supplied to a strength of 50μg. per ml., using a graduated pipette and the 100 ml. flask provided.

(b) Make further doubling dilutions, using distilled water and using the same pipette for each dilution, remembering that these dilutions are to be further diluted by adding broth to give the final concentration.

(c) Add the aqueous dilutions to broth so that in the final volumes of 10 ml., the inhibiting range from 5 to 0.15μg. per ml. is covered.

2. Examine the cultures labelled C, D, E, F and G microscopically, describing their colonial appearance; and microscopically by stained smears, describing their morphology. State the probable groups to which the organisms belong and write down briefly the next steps, if any, you would use in their identification.

3. You are provided with a series of culture media which have been inoculated with a pure culture of an organism isolated from the faeces of a patient suffering from gastroenteritis. Report on the biochemical reactions and identify the organism.

4. Identify the five spots: H, I, J, K and L.

Practical Paper (Biochemistry)

Answer all questions. *Time allowed 3 hours.*

1. Estimate the alkaline phosphatase in serum W.

2. Examine the urine specimen X for ketones, bilirubin, reducing substances and porphyrin.

3. Write brief notes on the equipment set out.

4. Estimate the urea content of the blood specimen Y. This is part of a urea clearance test. What other factors would you require in order to complete the test.

5. Using flame photometry, estimate the sodium content of serum Z. Express your answer in milliequivalents per litre.

6. Write brief notes on the reagents set out.

Practical Paper (Haematology and Blood Transfusion)
Answer all questions. *Time allowed 3 hours.*

1. Cells and serum are provided from patients A and Z. Select suitable donors for each from B, C, D, E, F, G. Give all grouping and crossmatch results on your answer paper.
2. Perform differential counts on films H, K, L, M, N, O.
3. Comment on films P, Q, R, S, T, V.

Successful Candidates

Culy, Miss P.	Wellington	McLachlan, Mrs J. B.	Auckland
Fissenden, Miss K.	Timaru	McRae, Miss K.	Rotorua
Haig, W. D.	Auckland	Olsen, R.	New Plymouth
James, Miss A.	Auckland	Sentance, Miss J.	Auckland
Joy, Miss P.	Auckland	Wong Too, R.	Auckland

Thirteen candidates were examined, four of whom had obtained partial passes in the April 1964 examination. Ten candidates passed, two obtained partial passes and one candidate failed the examination.

What's New

HOW TO DEAL WITH SPILLAGES OF HAZARDOUS CHEMICALS

In every laboratory, factory or other establishment in which chemicals are used or stored, spillages of chemicals occur. While some of these are harmless, prompt and effective action is frequently required to prevent damage to floors and benches, to minimise hazards to personnel, and to reduce the effects of lachrymatory or foul-smelling materials.

B.D.H.'s own long experience in dealing with chemical spillages of every type has prompted the production of a new wall chart for use in laboratories, which is being issued at the price of 7s 6d postage free.

Printed on stout paper in four colours, this publication is a companion to the B.D.H. Laboratory First Aid Chart, measuring approximately 30 x 38 inches.

Methods of dealing with spillages of over 300 hazardous compounds or classes of compound are described in detail. By means of a colour and letter code the chart also gives immediate information on the hazards associated with each chemical; superimposed numbers give the closed cup flash points of inflammable materials, and the maximum allowable concentration of toxic chemicals in vapour form.

The chart is available at 7s 6d postage paid from British Drug Houses Ltd.

VACUTAINERS IN NEW SIZES

B.D. "Vacutainers" are now available in new 2, 3 and 4ml. sizes, with sterile disposable needle-holder combination. The tubes are smaller than the existing tubes, being only 10.25 mm. internal diameter and 47 mm., 64 mm. and 82 mm. in length.

Inquiries from Biological Laboratories Ltd., Private Bag, Northcote.

NEW TECHNIQUES IN MICROBIOLOGY TESTING

A speedier method for identifying causative gram-negative organisms in bacterial infection has been evolved recently in the U.S.A. The new development, using test paper strips, is based on the fact that bacteria release enzymes which are characteristic of the producing organism. The test papers (trade name *PathoTec)* are banded with stable, standardised reagents, to yield a colour reaction in the presence of gram-negative organisms.

These reagents include a substrate to be acted upon by the enzyme characteristic of the organism, plus an indicator system which reacts with the product of enzyme activity, giving an easily identifiable colour change.

PathoTec test papers are used after the organism to be identified has been isolated in pure culture. The organism should then be grown overnight on triple sugar-iron agar, trypticase soy agar, brain-heart infusion agar or nutrient agar; highly pigmented media must not be used.

When the fresh (16-48 hours incubation) culture is available, it is tested with the *PathoTec* strips. Each test requires only a few minutes to run. At present there are four test paper strips:—

1. *PathoTec-CO,* for the identification of Pseudomonas, or Neisseria, based on the production of cytochrome oxidase.
2. *PathoTec-U,* for the identification of Proteus species, based on the production of urease.
3. *PathoTec-PD,* for the identification of the Providence group *(Proteus inconstans),* based on the production of phenylalanine deaminase.
4. *PathoTec-LD,* for the presumptive identification of salmonella, based on the production of lysine decarboxylase.

The advantages of the *PathoTec* technique are that there is no need to prepare reagents or special media, the reagents on the paper strips

are stable indefinitely under recommended storage conditions, and positive reactions are obtained very quickly.

PathoTec papers have been on the market in the U.S.A. for several months, but their availability in New Zealand will be subject to the granting of an import licence. The obtaining of a licence may be a lengthy procedure, but it is possible that a display of interest on the part of laboratories may help to expedite the granting of the licence by providing the intending importers with evidence of a demand for the product, which they can place before the Customs Department.

Inquiries to Wm. R. Warner & Co. Ltd., P.O. Box 430, Auckland.

DEXTROSTIX — A New One-minute Stick Test for Blood Glucose.

Dextrostix, a new rapid method of estimating blood sugar, was introduced at the meeting of the International Diabetes Federation, held at Toronto, Canada, in July, 1964, after eight years' research by workers of the Ames Company.

Dextrostix reagent strips are firm cellulose strips, impregnated with highly-purified glucose oxidase and a chromogen indicator system, under a semi-permeable membrane.

The membrane produces, in effect, a filtrate of whole blood, sequestering the formed cellular elements and permitting access of the glucose-containing filtrate to the underlying reagent system.

The glucose oxidase catalyses the oxidation of glucose to gluconic acid and hydrogen peroxide. The hydrogen peroxide then oxidises the indicator system to produce a hue and intensity of colour that is indicative, when compared with an accompanying colour chart, of the amount of glucose present.

Dextrostix is sensitive to as little as 20 mg. of glucose per 100 ml. of blood and, with the reference colour chart, values may be estimated from approximately 40 mg. up to 250 mg. per 100ml. of blood. The estimation of blood glucose can be carried out on a drop of blood obtained by fingertip, heel or earlobe puncture or from a venous sample (*not* containing fluoride); and the test is complete in one minute.

Dextrostix is expected to be available in New Zealand shortly, and the estimated cost to hospitals and laboratories is approximately 38s 6d per bottle of 25 strips.

Inquiries to Potter & Birks (N.Z.) Ltd., P.O. Box 11-125, Ellerslie, Auckland.

The Wellcome Foundation Limited

The Wellcome Foundation Limited is one of the largest private companies in the United Kingdom. Wholly-owned associated companies trade and manufacture in Australia, Belgium, Brazil, Canada, India, Italy, New Zealand, Pakistan, South Africa and the U.S.A. Additionally, the products of the company are distributed by a network of agents in most other important countries of the world. The Foundation owns the whole of the ordinary shareholding of Cooper McDougall & Robertson Ltd., a long-established company which manufactures and markets a wide range of veterinary, agricultural and other products throughout the world.

In its international operations the Wellcome Foundation has been, and is, characterised by heavy investment in medical and veterinary research. Many discoveries of lasting value in the prevention and treatment of human and animal diseases have been made in the research laboratories of the Foundation, and today the company is among the acknowledged leaders in the fields of biological production, immunology, virology, cardiology, pure chemistry and other disciplines.

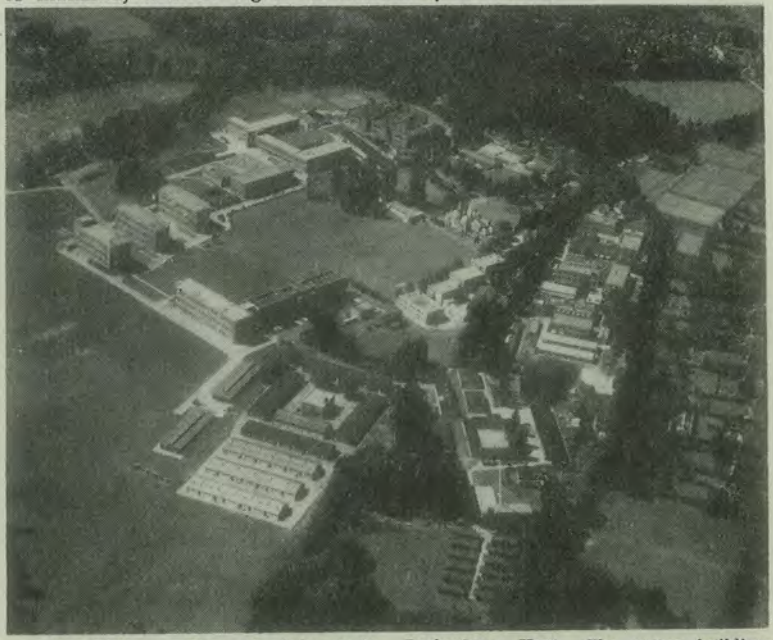
The Wellcome Foundation has been responsible for a great deal of pioneer work in quality control and pharmaceutical development, and in both fields important contributions have been made in analytical sciences

and production technology. Great importance is always attached to the achievement and maintenance of extremely high standards for every product which the company markets.

One of the most recent and significant discoveries made in the Wellcome Research Laboratories was the identification of a chemical which has proved to be of value in the control of smallpox epidemics, a discovery described in the editorial columns of the *Lancet* as perhaps ranking as the most significant advance in smallpox control since the days of Jenner.

The Foundation has grown from the simple partnership which started in 1880 between Silas M. Burroughs and Henry S. Wellcome; a partnership destined to last for only 15 years, and when Burroughs died in 1895, Wellcome became the sole owner of "B.W. & Co." under which style he continued to trade during his lifetime.

In 1924 Wellcome consolidated his world interests and established The Wellcome Foundation Ltd. He died in 1936 and left the Foundation in Trust. He willed that the Trustees should apply the profits paid to them to support research in human and animal medicine and allied sciences, and to aid the establishment or maintenance of museums, libraries, and research into the history of medicine. This placed The Wellcome Foundation in a position unique in the pharmaceutical industry. The profits distributed from its commercial operations are utilised by The Wellcome Trust; which independently applies such profits for the benefit of mankind, without regard to nationality or creed.



The Wellcome Research Laboratories, Beckenham, Kent. The newer buildings to the left of the central open space form the recently completed £2m. development scheme. They include a pharmacology unit (nearest camera and linked with the older chemical research laboratory) and (left to right) three buildings forming a virus department, an anaerobic bacteriology unit, and an immunology department. In the foreground are the stables, and to the right laboratories for bacteriological work, media production and veterinary research.

Council Notes

A Council meeting was held at Wellington Hospital on December 5, 1964.

Present were Mr H. G. Bloore (in the Chair), Miss J. Mattingley and Messrs C. W. Cameron, J. Case, M. McL. Donnell, E. K. Fletcher, H. E. Hutchings, R. T. Kennedy, J. D. R. Morgan and D. J. Philip.

Salary and Condition-Fixing Tribunal.

As a consequence of growing dissatisfaction among certain groups of hospital employees with the Salaries Advisory Committee system with regard to wage and condition fixing, a meeting was held in July 1964 between representatives of five organisations (N.Z. Dietetic Association, N.Z. Registered Occupational Therapists Association, N.Z. Physiotherapists Association, N.Z. Registered Nurses Association and the Society of Registered Male Nurses of N.Z.)

The purpose of this meeting was to explore alternative forms of negotiating machinery which might be mutually agreeable to hospital employees and their employers. It was eventually agreed that the representatives would report back to their own organisations the possible alternatives considered, and obtain the formal views of each organisation. It was also agreed, before proceeding with any alteration in the existing machinery, to request the Special Salaries Committee to settle all outstanding claims from each organisation.

These things done, a further meeting of representatives of the five organisations was called and a formal committee was set up, comprising one member from each organisation, with Mrs Margaret Pickard (of the N.Z.R.N.A.) as Secretary.

The proposals the committee had in view were:—

1. To work for the establishment of a hospital service tribunal, to function in a fashion similar to the Public Service Tribunal, but to cover exclusively hospital employees.

2. To form a loose-knit body representative of all employee organisations, which would have co-ordinating and advisory function, but would in no way interfere with the autonomy of the various individual organisations.

3. To consult with the executive of the Hospital Boards Association and, if possible, to obtain their support as representatives of the employing authorities before making representations to the Minister of Health regarding amendment of the appropriate section of the Act(s) governing wage and condition fixing for hospital employees, and the establishment of a hospital service tribunal.

At this point, the Institute was approached, in company with the other employee organisations, and an invitation was extended for us to send a representative to a meeting at which the proposals would be discussed and then presented to the executive of the Hospital Boards Association.

Mr H. G. Bloore, President of the Institute, was appointed by Council to represent the Institute at the meeting, which took place on October 15, 1964. Besides the original five organisations, eight others were represented (N.Z. Hospital Officers Association, N.Z. Medical Superintendents Association, N.Z. Public Hospital Engineers Association, N.Z. Orthopaedic Technicians Association, Society of Radiographers, N.Z. Medical Physicists Association, N.Z. Division British Medical Association and N.Z. Institute of Medical Laboratory Technology).

The present machinery for negotiation by hospital employee groups was set up in 1947 under Section 52 of the Hospitals Act. The dissatisfaction with the system has been felt by a number of employee organisations for some time, and the reasons relate principally to:—

1. Inadequate provision for negotiation and no provision for conciliation or arbitration.

2. Lack of a truly independent chairman on Salary Advisory Committees, since the Chairman is always a nominee of the Department of Health.

3. Prohibition of any authority for employees' nominees to report back to their organisations.

4. The fact that the recommendations of the individual S.A.C.'s are made only to the General Salaries Advisory Committee and that no-one is permitted to know what they are or what are the subsequent recommendations of the General S.A.C.

5. Lack of provision for regular presentation of submissions, and the extraordinary time lapse (two years is not uncommon) between the presentation of submissions and the ultimate promulgation of any new Regulations.

It was felt that a satisfactory solution would be the setting up of an independent tribunal for hospital employees, with an official mandate to receive, consider and determine all matters relating to conditions of employment and rates and scales of salaries. Such a tribunal should be composed of an impartial chairman, a member appointed on the nomination of the employers (the Hospital Boards Association) and a member appointed on the nomination of the employee organisations concerned. There should be provision for the appointment of assessors (one nominated by the occupational group whose claim is being heard, and one nominated by the employers). There should also be provision for each party to an application to be entitled to representation by an advocate, and for the calling of witnesses. Rules would have to be drawn up regarding the timing of applications and claims, conciliation procedures and other details, but the proposed tribunal could well follow the pattern of those already in existence such as those serving Public Services and Railway employees.

On October 16, a deputation, comprising the committee of representatives of the original five organisations, was received by the executive of the Hospital Boards Association. Some of the other organisations sent observers (including Mr Bloore for the N.Z.I.M.L.T.).

The outcome of the deputation was that the Hospital Boards Association expressed sympathy with the dissatisfaction at the S.A.C. system, but sought assurance of unanimity of support from among the various employee organisations.

It was then decided to acquaint the Minister of Health with the developments resulting from the meeting, and to seek the complete support of all employee organisations concerned.

Mr Bloore has pledged the support of the Institute, based on the motion carried at the 1964 Annual General Meeting, and indicated satisfaction with the purpose of the negotiations, subject to the conditions that any detailed proposals should be available for examination before final agreement is reached.

The 1965 Examinations

Faced with the acute problem presented by the growing number of candidates for the Intermediate and C.O.P. Examinations each year, the Medical Laboratory Technologists Board felt unable to accept the suggested solution that the practical examination should be replaced by a system of accrediting. Owing to special conditions, however, the 1965 Intermediate Examination will take a form somewhat different to that familiar from previous years. The written examination will consist of the usual two two-hour papers, but as an interim measure, for the one year only, the practical examination will be replaced by an intensified

oral examination conducted with a practical bias. One of the prior requirements from all candidates will be a detailed certification of knowledge of the practical work required. Entrants will be screened by the examiners in the three examination centres, and any doubtful or borderline cases will be re-examined by Dr Pullar, who will travel between the three centres during the week of the examinations.

The Final-C.O.P. Examination will be held a little later in the year than in the past, with the practicals being conducted in Dunedin during the May University vacations.

The largest difficulty in organising a satisfactory practical examination arises in regard to Biochemistry, where expensive apparatus must be provided sufficient to meet the needs of the large number of entrants. It is hoped that the 1965 examinations will produce an idea of the type and amount of equipment needed, and it is then proposed to approach the Department of Health for a grant of funds to create a pool of equipment for examination purposes. Failing this it may be that some assistance will be forthcoming through the Technicians Certification Authority or the technical institutes.

Future Examinations

It is possible that in future years entrants for the C.O.P. Examination may be able to take an examination in one subject at a time. With the examinations held twice yearly (probably in December and May,) it would be possible to spread the C.O.P. Examination over a period of two years. It is anticipated that this may be the first step towards the establishment of specialist qualifying examinations.

A committee of the Board, consisting of Dr Alexander and Messrs Bloore and Reynolds, has been appointed to keep in touch with local educational establishments to see how their facilities for the training of medical laboratory technologists develop.

Questionnaires are being sent to all training laboratories as a preliminary to the drawing up of a schedule of procedure for the conduct of the examinations. The Council felt that the standard of the examinations could do with considerable improvement, and it was decided to convey this view to the Board, with a strong recommendation that the pass mark should be raised to 60%, and that all examiners should be appointed sufficiently early to enable their proposed papers to be scrutinised by the full Board, with the object of ensuring a high standard and of eliminating questions of a clinical nature.

The Board decided that it would not be wise to lower the pre-requisite qualification for trainees for the C.O.P. to below U.E. standard, and where there was any question of deciding on equivalent qualifications the ruling of the Education Department would be accepted.

The simultaneous notification of results to all entrants in a particular examination will be practised whenever possible.

The New Examination Syllabuses.

The initial printing of the new syllabuses had been of only 500 copies. A second impression is in the course of preparation, and in due course a new edition will be published, in which the typographical and numbering errors will be corrected.

The syllabus will come into use in time for the 1966 examinations, and all candidates will be required to submit their copy of the syllabus which will have been used as a workbook during their training and will contain the certification by their senior or tutor technologist that they have covered each item.

The Associateship Diploma.

The new draft of the Associateship Diploma was examined and accepted. Four hundred copies will be printed in the 16 by 11½ inch size, and within the next few months the Secretary will arrange to have the diplomas prepared for the members already elected as Associates. These will not, however, be sent to Associates who are not currently financial.

The Auckland School of Medical Laboratory Technology

Mr Kennedy reported to the Council on the aims and aspirations of the Auckland School and said that a full-time training course of one year's duration was envisaged for the future. It was felt that the training programme at Auckland Hospital was a credit to the Auckland Hospital Board and that it goes a long way towards filling an important need. Some discussion followed on the desirability of the establishment of a second similar school, and it was agreed that this would help considerably in the national training of medical laboratory technologists.

Resulting from Mr Kennedy's production of a brochure, issued by the Auckland Hospital Board, publicising the career prospects of medical laboratory technology, it was decided that the Institute should assume responsibility for the publication of a similar document, for issue to vocational guidance officers and careers advisers throughout the Dominion.

1965 Annual Conference

The Secretary has been instructed to write to the National Airways Corporation to inquire about the likelihood of special flights between Wellington and Tauranga or, alternatively, about the possibility of chartering aircraft for the purpose of conveying members travelling from the South for the Conference on August 5 and 6. With the limited scheduled service into Tauranga it may well be necessary to seek some special arrangement with N.A.C. for the benefit of delegates from Wellington and farther south.

Derogatory Statement

In the programme for the 1964 Conference of the Hospital Boards Association, printed in the issue of *N.Z. Hospital* for September 1964, there appears a note to an item on "Recruitment of Staff," submitted from an unknown source as a talking point for a proposed discussion group on "Salaries and Wages." The inquirer asks whether or not there is merit in a proposal that staff recruitment (in particular in relation to X-ray and laboratory workers) should be handled through a central agency. The added note (to which grave exception is taken by the Council) reads:

> "It is submitted that the continued recruitment of females is a futile policy, in no measure assisting the long term shortage of experienced staff. If the recruitment is left to charge employees the latter are in a position to capitalise on the shortage and continue to aggravate it by the employing of predominantly female staff. Is not an academically mediocre male of more use to the Hospital service than a brilliant female, to be lost to the hospital within, say, five years."

The president reported that he had already written to the Secretary of the Hospital Boards Association, pointing out the reasons for the engagement of female trainee staff, resenting the obvious reflection on the integrity of charge technologists and expressing the hope that the Editor of *N.Z. Hospital* would be instructed to publish a retraction of this damaging misconception.

Applications and Resignations

The following new members were enrolled:

Associates

Evans, Miss M. E. Dannevirke
Stenbeck, C. L. Auckland
Walton, Miss G. R. Auckland

Members

Caverhill, Miss G. A.	New Plymouth	Paton, Miss M. G.	Auckland
Chalmers, D. G.	Stratford	Robertson, D. A.	Dunedin
Haines, D. J.	Hamilton	Wilson, Miss J. C.	Timaru

The following applicants for Associate membership were approved:

Beckett, K.	Malden, U.S.A.	Eccersall, L. G.	Hamilton
Cannon, J. J.	Powell River, Canada	Ekdahl, M. O.	Wallaceville
Chambers, G. L.	Auckland	McDiarmid, Miss H. J.	Hamilton
Collins, B. S.	Ruakura	McLachlan, J. H.	Auckland
Davis, G.	Auckland	Rusbatch, Miss R.	Dunedin
Dixon, F. C.	Nelson	Silvester, Mrs E.	Opotiki
Eales, Miss M. M.	Christchurch	Thomas, J. C.	Napier
		Wales, R.	Kawakawa

Resignations

Written resignations were accepted with regret from:

Harding, Miss J.	Auckland	Manttan, B. M.	Christchurch
Hood, Mrs A. M.	Blenheim	Sweeney, Miss D. R.	Christchurch
McKay, Miss E. A.	Christchurch	Withers, Miss D. L.	Timaru

On failure to pay subscriptions for the years 1963/64 and 1964/65 and in absence of written resignation, the following names were removed from the Roll in accordance with Rule 10(c):

Beagley, Miss E.	Thames	Palmer, Miss S.	Auckland
Bilkey, K.	Auckland	Phillips, O.	Auckland
Dashfield, K.	Palmerston Nth.	Robertson, B.	Thames
De Silva, G. D.	Auckland	Russell, A.	Westport
Dix, M. R.	Auckland	Taylor, D. M.	Auckland
Lowes, Mrs R.	Hastings	Van Voorthuizen, J.	Christchurch
McFarlane, K.	Auckland	Watts, Mrs M.	Auckland
Mackintosh, Miss J.	Wellington	Wood, Miss P.	Wellington

The following new members who had been enrolled but had failed to pay their initial subscriptions (1963/64) were also removed from the Roll:

Bain, A. C.	Christchurch	Kettle, Miss K.	Auckland
Cameron, Miss C. L.	Wellington	Kirkham, B. M.	Auckland
Dawson, Miss R.	Auckland	Maddocks, Miss P.	Wellington
Dickey, W. G.	Auckland	Martin, J. S.	Gisborne
Duggan, Miss L.	Auckland	Montgomery, E. J.	Auckland
Elliot, B. J. P.	Auckland	Patterson, Miss Y. C.	Auckland
Gilmour-Wilson, Miss S. K.	Masterton	Reed, Miss M. F.	Auckland
Glover, G. C.	Auckland	Robinson, J. V. A.	Timaru
Hamilton, T.	Auckland	Scott, I. D.	Darwin, Aust.
Hawkless, J. R.	Taumarunui	Subritzky, N. G.	Auckland
Hay, Miss E. C.	Auckland	Somerville, Miss M. J.	Auckland
Jackson, Miss D. F.	Masterton	Thorne, G.	Auckland
Keedwell, Miss D.	Masterton	Tunua, Miss C.	Auckland
Kerr, Miss C. E.	Auckland	Wrightson, Miss M. L.	Auckland
		Yeoman, D.	Auckland

Branch Reports

DUNEDIN

(Secretary: A. McD. Stewart, Pathology Department, Medical School.)

Meetings of the Branch were held on September 9, November 14, and the Annual General Meeting on September 30.

At the September meeting, Dr Taylor gave an informative talk on the physiology of skin diving. The following office-bearers were elected at the Annual General Meeting:—

Chairman: Mr B. W. Main.
Secretary: Mr A. McD. Stewart.
Treasurer: Mr J. Rees.
Committee: Messrs R. D. Allan, J. D. R. Morgan, H. C. W. Shott.

The Dunedin members travelled to Invercargill for the November meeting, at which three papers were presented. Mr J. Braidwood spoke on the speeding up of non-automative biochemical techniques. Mr O. Denis presented a case history of a case of monocytic leukaemia, and Miss D. Bedford read a paper on colicine typing of Shigellae.

The year's activities concluded with a social function, held at the home of Mr J. Braidwood.

Preparations are well in hand for the South Island Seminar, to be held at Ashburton on March 20. There will be forums on Microbiology, Biochemistry and Haematology, concluding with a dinner in the evening.

A.McD.S.

MANAWATU - HAWKES BAY GROUP

On Saturday, November 21 1964, thirty-two technologists from Palmerston North, Dannevirke, Waipukurau, Napier and Hastings gathered for an informal one-day seminar. Interest was also expressed by technologists from Gisborne and Wairoa, who were unable to attend on this occasion.

Dr R. Taylor, Pathologist at Napier Hospital, welcomed delegates to the meeting.

In the morning session, Dr D. A. Ballantyne, a consultant physician of Hastings, gave a talk about his world trip, mostly centred on his experiences in Russia. The talk was illustrated with excellent colour slides and gave those present an insight into the architecture, culture, geography and history of the country. Mr G. McKinley proposed a vote of thanks to Dr Ballantyne, which was heartily endorsed by all present.

Following Dr Ballantyne's address, there was a short period of informal discussion until lunch time. An opportunity for better acquaintance between those attending was afforded by lunch, which was generously provided by the Hospital in the staff dining room, pleasantly set out for the occasion.

The afternoon session commenced with a discourse by Dr R. R. Lycette, Pathologist of Hastings, whose subject was "Nuclear Sexing and Chromosome Techniques." The chromosome patterns in a number of syndromes were explained with the aid of photographic slides. Dr Lycette also commented on the fact that this is a fairly new field of work within medical laboratories. He pointed out that nuclear sexing came within the capabilities of the average laboratory, although work with chromosomes calls for special facilities. His lecture concluded with a brief description of some of the functions of DNA within cells. Mr H. E. Hutchings proposed a vote of thanks to Dr Lycette, for his interesting talk, and this was endorsed in the age-old manner.

Later, a more formal business meeting was held. It was decided to arrange another meeting of the same nature at Palmerston North during May 1965. The possibility of looking into the question of applying to the N.Z.I.M.L.T. for recognition as a branch of the Institute, but it was generally agreed that any decision on this matter should be deferred for the present. It was thought that this could be reconsidered at a later date, when it would be possible to assess the enthusiasm in attendance.

The meeting concluded with afternoon tea, and delegates departed for home by 4 p.m.

P.A.T.
B.M.

The Library

List and Contents of New Periodicals Received.

Librarian: D. S. Ford, Pathology Department, Medical School, Dunedin.

Amer. J. med. Technol. Volume 30, No. 4. July-August, 1964.

Contents: The Techniques of Immunoelectrophoresis; The Latex-Protein Agglutination Test as a Screening Diagnostic Procedure in infectious Mononucleosis; Effects of Venous Occlusion on the Activity of Serum Enzymes; A Hemagglutination-Inhibition Titration Technic for Detecting and Measuring Antigen Specific in Secreter Saliva; Further Simplification of a Serum Protein-Bound Iodine Determination; Part I — A Review of the Literature on Classification of the Mima-Moraxella; Part II—The Morphology and Biochemical Reactions of the Moraxella-Mimae Group; A Negative Enrichment Technique for the Isolation of Beta Hemolytic Streptococci; Medical Technology and the Human Factor; An Effective Hemoglobin Control System.

Volume 30, No. 5. September-October, 1964.

Contents: Experience with a Performance Control Programme in Syphilis Serology; Identification of Non-Sporulating Anaerobes; A Routine Paraffin Technique and Stain for the Demonstration of Lipid Deposits in Tissue Sections; Understanding Chromosome Analysis; The Routine Antibiotic Disc-Plate Sensitivity Test; Danger-Contaminated Material; A Rapid Immunological Test for Pregnancy; An Item of Interest to Bacteriologists.

Volume 30, No. 6. November-December, 1964.

Contents: Further Studies of Bodian's Technique, with Special Emphasis on the Impregnating and Reducing Solutions; Principles for the Histochemical Localisation of Hydrolytic Enzymes; Estimation of Plasma Sodium and Potassium Ions. A Rapid Method Employing a Simplified Dilution Technique; Identification of Three Hemin-Requiring Bacteroides Strains; Methodology of Isolation, Identification and Incidence of Clostridia from Clinical Material; A Correlative Survey of Five Clinical Chemistry Procedures; Pitfalls in the Performance and Interpretation of Laboratory Studies for Hemorrhagic Disorders; Effect of Changes in Incubation Time and Temperature on Alkaline Phosphatase Activity; A Study of Leukocyte Alkaline Phosphatase in Normal and Disease States in Children; The Propagation of Anaerobes is Easy.

Ann. Med. exp. Biol. Fenn. Volume 42, No. 2. 1964.

Selected contents: Polyhydric Alcohols in Human Urine; Ion Shifts Produced by Hypertonic Sodium Chloride Infusions in Man; Extraction of Some Histochemical Enzyme Substrates from Water with Ethyl Ether; The Influence of Borate on Some Haemagglutination Reactions; Isolation of Some Viruses Other than Tick-Borne Encephalitis Viruses from *Ixodes ricinus* Ticks in Finland.

Volume 42, Suppl. 1. 1964.

Contents: On Acute Fatal Poisonings in Finland in 1958, and Their Detection.

Volume 42, Suppl. 2. 1964.

Contents: Cancer Illness in Finland.

Arch. Inst. Pasteur hellen. Volume 9, No. 2. December, 1963.

Contents: Isolement d'un Corynebacterium anaerobium au Cours d'un Syndrome du Type Pneumonie Atypique a Virus; Isolement des Salmonella a Partir de Cas Humaines de Diarrhee en Grece; L'Importance

du Milieu de Culture dans la Colicinetypie des *Escherichia coli;* La Colicine dans le Traitment Prophylactique de l'Embryopathie Rubeolique; Etude *in vitro* de la Sensibilite aux Antibiotiques de 66 Souches Microbiennes par la Methode de Sensitabs.

Aust. J. biol. Sci.
Volume 17, Nos. 3, 4. August-November, 1964.

Canad. J. med. Technol. Volume 26, No. 4. August, 1964.
Contents: Relation of Technique to Discovery; Presence de l'Anticorps Jk^a (Kidd) Associe aux Anticorps c et E; Plasma Hemoglobin; Use of Anion Exchange Resin for Routine Determination of PBI; Haemoglobin H Disease in Hawaii; The Electronic Blood Cells Counter in Routine Hematology.

Volume 26, No. 5. October, 1964.
Contents: Search for a Staining Technique Providing Clear Differentiation of the Components of Vessel Walls; Etude Comparative du V.D.R.L. et du P.C.T. (PlasmaCriT) dans l'Elimination de la Syphilis; Hospital Epidemic of Salmonella Heidelberg Infection; Flame Photometry.

J. med. Lab. Technol. Volume 21, No. 3. July, 1964.
Contents: A Comparison of Formaldehyde Fixation Methods Used in the Study of Pulmonary Emphysema; The Colorimetric Estimation of Haemoglobin; Absolute Red Cell Values and Indices; Isopropanol as a Single Antemedium for Paraffin Processing; An Automated Modification of Eichhorn's Uric Acid Method; A Low Temperature Storage Cabinet; Preservation and Storage of Bacterial Cultures; A Lactose Test for Group D Streptococci; Concentration Method for the Detection of Minor Haemoglobins.

Volume 21, No. 4. October, 1964.
Contents: Immunological Tests for Pregnancy; The Estimation of Lead in Blood; Notes on the Acid Elution Test for Detecting Foetal Erythrocytes; The Sectioning of Undecalcified Tissue Using a Diamond-Impregnated Cutting Disc; The Value of the Germ-Tube Production Test in the Rapid Identification of *Candida albicans*; Determination of Haemoglobin Concentration and Leucocyte Count Using a Single Blood Dilution; The Laboratory Investigation of Catecholamine-Secreting Tumours; The History and Development of Antibacterial Chemotherapy; A Modified Technique for the Demonstration of Acid Phosphatase in Tissue Sections.

Lab. Management. Volume 2, No. 5. September, 1964.
Selected contents: Recruiting Laboratory Personnel; How To Buy an Instrument; Planning the Clean Room; Planning for Bio-Medical Research; Researchers Design Own Laboratories; Ion Exchange Resins.

Volume 2, No. 6. November, 1964.
Selected contents: Laboratory Maintenance; Uses of Atomic Absorption; Breakthrough in Electron Microscopy; Detergent Systems for Laboratory Glassware; Are We Utilising Scientific Talent? Job Descriptions; Automation in Blood Banking.

Lab. World.
Volume 15, Nos. 8, 9, 10, 11, 12. August-December, 1964.

Med. Surg. (Baroda).
Volume 4, Nos. 8, 9, 10. August-September-October, 1964.

Microbiologia (Buc.). Volume 9, No. 2. March-April, 1964.
Contents: Indicators in the Anti-Epidemic Field; Problems Concerning the Epidemiology of Accidental Laboratory Infections; Contributions to the Problem of the Duration of Germ-Carrying in Dysentery and its Epidemiological Importance*; Some Routes of Inoculation of Guinea Pigs and Mice for the Bacteriological Diagnosis of Tuberculosis*; Serological

Diagnosis of Adenoviruses by the Boyden Reaction of Passive Haemagglutination*; The E.O.F. Test of Precipitation in Gel for the Detection of Toxinogenesis *in vitro* of *C. diphtheriae*; A Fast and Practical Serological Method for Routine Bacteriological Diagnosis*.

[All articles in Rumanian, but those marked * have English summaries.]

Volume 9, No. 3. May-June, 1964.

The contents of this issue are devoted to the subject of Helminthology (in Rumanian).

Volume 9, No. 4. July-August, 1964.

Contents: The Viral Aetiology of Human Leukaemia in the Light of Recent Investigations; The Topical Interest of the Investigations of Professor Ion Cantacuzino in the Field of Immunity in Invertebrates; Food Poisoning Caused by Salmonella*; Food Poisoning Due to *Salmonella paratyphi C**. Contributions to the Investigation of the Viability of Salmonella Species in Sausages; Investigations Concerning the Kaolin Agglutination Stereoreaction with Phosphatide Antigen as a Test of the Activity of Tuberculous Lesions*; Human Infection with *Pasteurella pseudotuberculosis* Confirmed by Serological Tests*; Human Pseudotuberculosis Confirmed by Isolation of the Bacteria from the Urine*; Investigation Concerning the Spread of Lambliasis in a Children's Collectivity* A Comparative Study of Adenovirus Antibodies by Passive Haemagglutination and Complement Fixation Tests*; A Study of an Epidemic of Infectious Mononucleosis in a Village*.

[*English summary.]

Volume 9, No. 5. September-October, 1964.

Selected contents: Investigations Concerning the Diagnosis of Toxigenic and Non-toxigenic *C. diphtheriae* in Pure Cultures or in Association with Diphtherimorphs, Staphylococci, Pneumococci and Streptococci†; Experimental Investigations Concerning the Viability of Bovine Tubercle Bacilli in Butter; Viability of the Bacterial Species *Sh. sonnei, Sh. flexneri* and *M. pyogenes* var. *aureus* in Some Acid Milk Derivatives Used in the Diet of Small Children†; Fatal Bronchopneumonia Caused by a Micro-organism of the Genus Bacillus (*B. cereus*)*; The Performance of Complement Fixation Tests on Well-Slides of Plastic Material in Adenovirosis.

[*English summary; †French summary.]

New Instanbul Contr. clin. Sci.

Volume 7, No. 1/2. January-April, 1964.

Selected contents: The Structure of Cellulose and the Order of Sugar Spots on Paper Chromatograms; The Control of Haemophilic Bleeding; An Aminopeptidase in Human Brain Tissue Thromboplastin Preparations; Etude de la Duree de Vie des Plaquettes au cours des Purpuras Thrombocytopeniques; Fibrinolysis in the Aged; Platelets, Erythrocytin and Tissue Thromboplastin; Function of Ac-Globulin and Lipid in Prothrombin Activation; Platelet Functions in Essential Thrombopenia and Secondary Thrombocytopenias; The Role of Platelets in the Pathogenesis of Von Willebrand's Disease.

N.Z. Hospital. Volume 17, No. 2. November, 1964.

Offic. J. Amer. med. Technol.

Volume 26, No. 4, July-August, 1964.

Contents: Electrocardiography, Pacemakers and the Medical Technologist; Controlled Quality; Statistical Evalution of Two Methods for Determination of Serum Total Proteins; Fluorescence Microscopy for Screening Exfoliative Material with Acridine Orange Staining Technique; Inorganic Sulfur in Serum and Urine; Bilirubin in the Newborn; Controlled Quality in Urinary Microscopic Examination.

Volume 26, No. 5. September-October, 1964.
Contents: Diagnostic Microbiology for the Smallest Clinical Laboratory; Laboratory Test Data; Clinical Estimation of Glucose in Biologic Fluids by a Modified Copper Reduction Method; Clinical Estimation of Glucose in Biologic Fluids by a Modified Glucose Oxidase Method; A Synopsis of Literature on the History of the Microscope.

Rev. viernes Med. Volume 15, No. 2. May-August, 1964.

S. Afr. J. med. Lab. Technol. Volume 10, No. 2. June, 1964.
Contents: Serological Reactions; Some Simple Differential Bacteriological Culture Methods.

Volume 10, No. 3. September, 1964.
Contents: Laboratory Analysis of Amniotic Fluid; Blood pH Estimation Using Capillary Blood; Some Unexpected Findings During Routine Laboratory Examinations.

Tonic (Wellington Hospital house journal).
Volume 2, Nos. 3, 4, 5. 1964.

EDITORIAL VERBOSITY

Sir:

Your reply to my letter entitled "Editorial Verbiage," appearing in the October issue of our journal, dismays and delights me. Delights when I see again proof of your verbosity, and dismays when I realise that your right hand obviously does not know what your left is doing.

1. Quote: ". . . only the feeble minded would expect the Voice of Authority to speak through the medium of our journal."

To justify my assertion that some technologists could assume that this blood bank procedure of yours was the result of a selected panel's deliberations on the subject, may I remind you of a remit moved by your elf and seconded by Mr Morgan, which was carried at the last Annual General Meeting just a few short months ago:

Moved:

> That it be a resolution of this Conference that the Secretary of the Institute shall convey to the Editor of the Journal the substance of all official communications . . . with the object of ensuring that the entire membership becomes immediately aware of any changes.

I can only assume you consider all members feeble-minded if they expect this directive to be implemented.

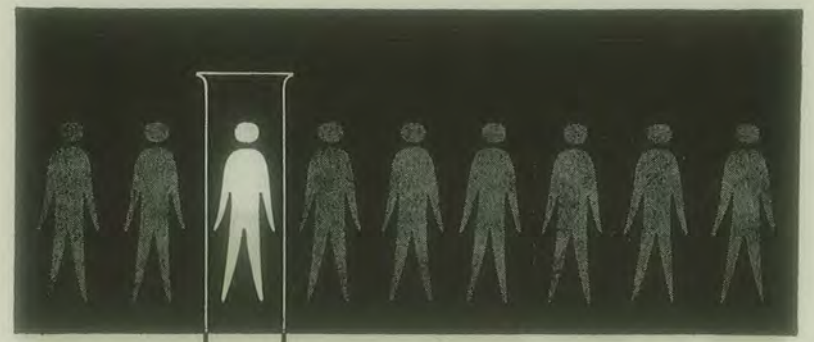
2. Since the *editorial* was signed with your initials, you assert that it was obviously you who was hoping that procedures *Towards Greater Safety in Blood Transfusion* would be pinned on every laboratory wall. I repeat that unless the editorial is pinned up also, there is no authority for the suggested methods. Your assertion: "In the absence of any authority . . . everything printed within these pages represents an individual opinion" will only stand up to examination as long as the journal remains intact. In fact, having removed the centre pages there is nowhere on them any indication as to what publication they originally appeared in.

I. C. KING

November 12, 1964.

[1. There is a world of difference between publishing reports of official pronouncements for the information of the membership and acting as the medium of official promulgation. When such reports appear in the *Journal,* the source and authority are always stated at the beginning. (See page 30 of Volume 17 and page 51 of Volume 18.)

2. Quite so, but as it is not the policy of the Department of Health to issue directives anonymously, is it really very likely that anyone would credit the Department with being the authority behind anonymous material printed on a page torn from an equally anonymous publication? —Ed.]



to detect bleeders before surgery

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Platelin™

standardized platelet factor reagent

Newer tests have been devised tc replace the Lee-White Clotting Time, which is known to miss nearly 50% of proven hemophilia cases.(1). These tests are far more dependable indicators of potential bleeders than the routine bleeding and clotting times. They are relatively rapid and simple. But they require a rigidly standardized platelet factor reagent. Until now, no such reagent has been readily available.

PLATELIN is platelet factor reagent, rigidly standardized against normal plasma, against DIAGNOSTIC PLASMA Warner-Chilcott and against plasmas deficient in stage one clotting factors.

Using PLATELIN, any worker skilled in the technique of the Quick One-stage Prothrombin Time can rapidly perform either of two new and sensitive coagulation screening tests:

The Hicks-Pitney Test(2)—a rapid, simplified screening version of the Thromboplastin Generation Test, especially adapted for routine use, which duplicates the extreme sensitivity of the TGT. The only commercial reagents needed are PLATELIN and DIAGNOSTIC PLASMA Warner-Chilcott.*

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Complete directions for performing and interpreting both the Hicks-Pitney and the Partial Thromboplastin Time tests are included with each package of PLATELIN.

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Each vial of PLATELIN is sufficient for 12 Hicks-Pitney or 25 Partial Thromboplastin Time tests.

Boxes of 10 vials, 2.5 ml. size, 60/-.

References: 1. Wilkinson, J. F.; Nour-Eldin, F.; Israels, M. C. G., and Barrett, K. E.: **Lancet** 2:947 (Oct. 28) 1961.
2. Hicks, N. D., and Pitney, W. R.: **Brit. J. Haem.** 3:277, 1957.
3. Langdell, R. D.; Wagner, R. H., and Brinkhouse, K. M.: **J. Lab. & Clin. Med.** 41:637, 1953.

* In addition to its use as a reagent in the Hicks-Pitney test, DIAGNOSTIC PLASMA Warner-Chilcott remains the normal plasma of choice for quality control of the one-stage prothrombin time and other coagulation tests. Make sure your supply of DIAGNOSTIC PLASMA Warner-Chilcott is adequate.

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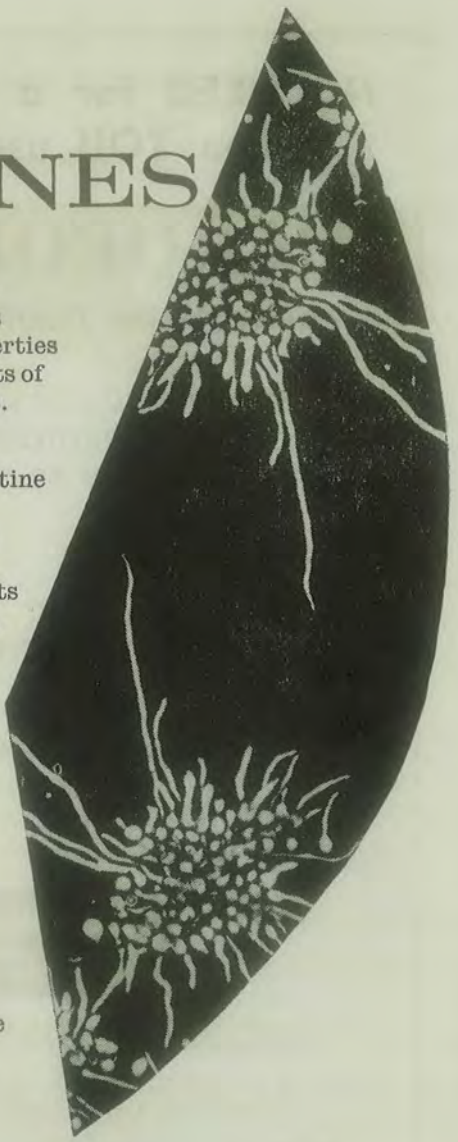

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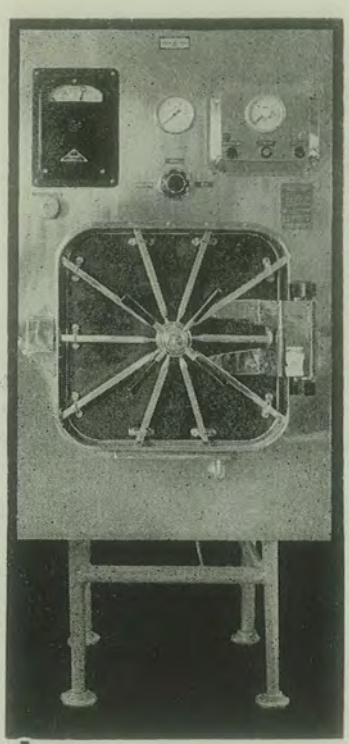

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