Vol. 8, No. 1. April, 1953.

JOURNAL OF THE NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

CONTENTS

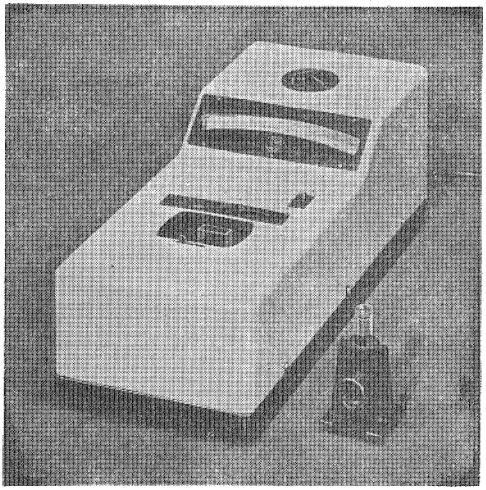
Communications regarding this JOURNAL should be sent to the Editor, Department of Pathology, Auckland Hospital, Auckland, C.3.

Communications primarily affecting the Association should be addressed to the Secretary, Mr. G. W. McKinley, Bacteriology Department, District Hospital, Waipukurau.

All monies should be paid to the Treasurer of the New Zealand Association of Bacteriologists (Inc.), Mr. H. T. G. Olive, Pathology Department, Public Hospital, Wellington.

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

A New HILGER *Biochem Absorptiometer*



- Accurate Reading.
- Speedy Operation.
- Precision Cells 1/4 to 4 cms long.
- Test Tube Mount optically compensated.
- Usable with less than 4 ml in a 1 cm cell.
- Eight Narrow-band Filters in Rotating Disc, protected from dirt or damage.
- Built-in Constant Voltage Transformer for use on 50 c.p.s. AC at 200-250 volts or 4 volt accumulator.

FOR ALL YOUR SCIENTIFIC REQUIREMENTS, CONTACT

WATSON VICTOR
LIMITED
(INCORPORATED IN NEW SOUTH WALES)

AUCKLAND
WELLINGTON

WatVic

CHRISTCHURCH
DUNEDIN

JOURNAL
of the
NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

Vol. 8, No. 1 April, 1953.

JOURNAL COMMITTEE

Mr. Douglas Whillans has now stepped down from active participation in the Journal, and Mr. John Sloan has come onto the committee in his place. Mr. Whillans was responsible for establishing this Journal and for four years he carried out the printing, editing, publishing and distributing, as well as canvassing the advertisers, and gently prodding reluctant contributors. This was no easy task and it was due solely to his efforts that the Journal continued to function. For the past two years he has acted as associate editor. Now he has decided to take a well-earned rest, although he assures us that his advice and criticism will be available at all times. Every member owes a debt of gratitude to Mr. Whillans for his untiring work in establishing and maintaining this essential link between members.

ACCURACY IN LABORATORY TESTS

The laboratory represents one of the scientific aspects of medicine. Laboratory reports are presumed to be matters of fact, not of judgment. When a urine is examined for the presence or absence of casts there should be no justification for argument about the report. Unfortunately from the very nature of hospital laboratory work there is very little margin for error, even human error, and this places a big responsibility on the Hospital Bacteriologist to see that any report which he or she issues is as nearly correct as is humanly possible.

Under the conditions which prevail in this country at the present time there may be some justification for many laboratory investigations to be regarded as merely "for the record" and therefore of little importance. It is, however, not the prerogative of the Hospital Bacteriologist to question the value of any request and anyone who does so is treading on dangerous ground.

The pressure of excessive work which renders accuracy in all procedures impossible, is a problem which confronts most Hospital Bacteriologists and it is to their credit generally that fallacious reports are comparatively rare. The introduction of "screen-tests" in some departments has reduced the amount of work to some extent but with technical procedures cut to a minimum, accuracy becomes even more important.

One cardinal sin not uncommon amongst laboratory staff is the fear of confessing ignorance. All too frequently a person is found who believes that to admit the inability to carry out a test, or to recognise what he sees will admit lack of qualification. Attempts to conceal these deficiencies will almost certainly result in an incorrect report. No worker can possibly know all the answers in the laboratory field and anyone who does not ask questions or does not see a confusing phenomenon is admitting the inability to recognise the unusual.

Laboratory personnel, with the tools and techniques available, can come closer to absolute accuracy than the members of any other branch of medicine. The Hospital Bacteriologist discharges his responsibility to the patient by conscientious and careful work, recognition of his limitations and by not being reluctant to ask for help when problems exceed these limitations.

CHLOROPHYLL

An article in a recent *Lancet*, 23/8/52, discussed chlorophyll as a deodorant. Large quantities of chlorophyll are being imported into America from England as a result of a high pressure advertising campaign claiming the neutralisation of every bodily odour. After quoting the views of various authors on the possible reasons for this peculiar property the author goes on to suggest that not only is the mechanism of the action unexplained but it is not at all definite that the action exists at all, except in the mind of the observer. Not all herbivorous animals are entirely free from smell as is pointed out in the following couplet:—

"The goat that reeks on yonder hill
Has browsed all day on chlorophyll".

There is an extraordinary degree of unanimity in the claims of various authors but the article points out that all tests were carried out by interested parties and a plea is made for an independent chemist and clinical research worker in an academic laboratory to provide a disinterested opinion.

THE IDENTIFICATION OF SALMONELLA SAINT PAUL IN NEW ZEALAND

S. W. Josland

Animal Research Station, Department of Agriculture, Wallaceville.

In September, 1952, Mr. G. George, bacteriologist at Rotorua Hospital, submitted a culture of an organism which had been isolated from the faeces of a female European, aged 37, with the following history:—

"Dysentery for 6 months, recurring at intervals and lasting for 1-7 days with up to 12 bowel motions per day—stools mucoid, no obvious blood, complains of vomiting and abdominal pain high up which is relieved by defaecation. General clinical examination normal. Other possible causes of dysentery were ruled out by clinical and laboratory examinations. Tests for occult blood in faeces were positive. Blood counts and urinalysis normal."

From the faeces a gram negative, motile, non lactose fermenting bacillus was isolated both by direct plating on to McConkey's medium, and by plating after enrichment in tetrathionate broth. The organism was sensitive to chloromycetin and streptomycin but not sensitive to aureomycin, penicillin or the sulpha group.

The biochemical reactions of the organism were found by Mr. George to be as follows:—

Lactose and sucrose were not attacked.
Glucose, mannite, maltose and dulcite were fermented.
Methyl red test positive.
Indole was not formed.
H_2S was produced.
Urea was not decomposed.
There was no liquefaction of gelatine.

These are typical reactions of a number of the Salmonella group and the organism had been found to be agglutinated by "O" sera for S. paratyphi B, and to a lesser extent by S. paratyphi A and S. typhi sera.

Investigation at Wallaceville

"O" groups: The organism was agglutinated to near titre by IV. V. XII. and to a lesser extent by I. II. XII. and IX. XII. sera. No agglutination could be obtained with I, III. XIX. (seftenberg) serum nor with a single factor I. serum prepared from S. paratyphi by absorption with S. paratyphi A. var. durazzo; nor did agglutination occur with a single factor V. serum. The "O" grouping was therefore IV. XII.

"H" groupings. After motility had been improved by several passages through semi solid agar, the organism was grown in broth and the broth culture was flocculated to titre by 1, 2 serum

and by single factor 2 serum prepared by absorption. No other phase could be demonstrated, but after two passages through semi solid agar to which factor 1, 2 serum had been added phase I. swarmed and was agglutinated to titre by factor eh serum. The "H" antigens were therefore eh; 1, 2 and the complete antigens IV. XII; eh, 1, which are those of S. saint paul, but lacking antigens I. and V.

A subculture was sent for confirmation to Dr. P. R. Edwards (1952) of the United States Public Health Enteric Reference Laboratory, Chamblee, Georgia, who confirmed the identification of S. saint paul; and stated that it must be recognised that these organisms may occur with or without factor V. Cultures of S. typhi nurium from human and animal sources examined at this station have occasionally been found to lack the V. antigen.

Discussion

S. saint paul was first isolated and identified from the liver of a turkey poult by Edwards and Bruner (1940). Subsequently Kauffman (1941) identified a related organism S. zagreb IV. V. XII.; eh; 1, 2 which lacked the factor I. S. zagreb is not included in the Kauffman White diagnostic schema (1950) but is joined with S. saint paul. The organism described here is a further serological variant of S. saint paul lacking factors I. and V.

S. saint paul infections occur rarely. Thus Edwards, Bruner and Moran (1948) reporting on the occurrence and distribution of the Genus Salmonella in the United States found only 14 outbreaks due to this salmonella in a total of 7365 outbreaks studied. Of these 6 occurred in man, 6 in turkeys, 1 in a horse, and 1 in swine. Twelve cultures from human sources were isolated from faeces. Of these 2 were from patients with enteric fever, 5 were associated with gastro enteritis and 5 were from asymptomatic carriers. There were no fatal cases. Varela (1952) did not find S. saint paul among 1075 salmonella cultures isolated in Mexico City. Seligmann, Saphra and Wasserman (1943) have recorded 1 isolation of S. saint paul from 1 case among 1000 cases of salmonella infections in man.

In a study of 387 cultures of salmonella isolated from man and animals in Hidalgo County, Texas, Watt and de Capito (1950) found S. saint paul once in man and on 3 occasions in chicken and duck.

S. saint paul was not encountered by Lindberg and Bayliss (1946) among 202 salmonella cultures isolated from military and civilian personnel throughout the islands of the Pacific ocean. To the best of the writer's knowledge this salmonella has not been isolated from human or animal sources in Australia. It is clear

therefore that this organism is of uncommon occurrence among both man and animals.

Summary

S. saint paul IV. XII.; eh; 1, 2 has been identified from a human source in New Zealand.

The organism described here is a serological variant of S. saint paul lacking somatic antigens I. and V.

ACKNOWLEDGMENT

The writer wishes to thank Mr. G. George, bacteriologist, Rotorua Hospital, who carried out the preliminary examination of this organism, and who kindly supplied the brief clinical history.

REFERENCES

Edwards P.R. (1952) Personnal communication.

Edwards P.R. and Bruner (1940) J. Inf. Dis. 66, 218.

Edwards P.R., Bruner D.W., Alice B. Moran (1948) Kentucky Agric. Exp. Station Bulletin 525.

Kauffman F. (1941) Acta. Path. 18. 351.

Kauffmann F. (1950). The diagnosis of Salmonella types. Charles C. Thomas, Illinois, U.S.A.

Lindberg R.B. and Bayliss M. (1946) J. Inf. Dis. 79-1-91.

Seligman E, Saphra I. and Wassermann M. (1943). Amer. J. Hyg. 38-3-226.

Varela G. (1952) J. Lab. Clin. Med. 40-1-73.

Watt J. and Thelma de Capito (1950) Amer. J. Hyg. 51-3-343.

BLOOD GROUPS IN RELATION TO ETHNOLOGY

Phylllis B. Scott

(*Pathology Department, Auckland Hospital*)

In the past, racial differentiation has been based upon characteristics such as skin and colour, stature, cephalic and nasal indices. However, the best physical anthropological classification of man is ideally based upon genetic characters, the inheritance of which is clearly understood., and which are not influenced by environment. Blood groups are suitable characteristics for this purpose because they are inherited in a known way according to Mendelian principles, and are not altered by differences in climate, food, illness, or medical treatment.

The frequencies of blood groups in a population is a very stable characteristic; the blood groups themselves probably arose very early in the course of man's evolution—they have been demonstrated in Gibbons, Gorillas, Chimpanzees, Orang-utans, Lemurs and by special absorption techniques they have been demonstrated in Egyptian mummies.

The blood groups are sharply distinguishable "all or none" characters which do not grade into one another as do, for example, skeletal characteristics and skin and eye colour. Therefore, as every individual will belong to either one or other blood group of whatever blood group system is being considered e.g., ABO, MN or Rh—the only differences which can be found will be differences in frequencies.

The earliest racial classifications based on blood groups were restricted to the ABO blood group system and resulted in an inadequate classification, because one criterion is not enough—the requirements of modern physical anthropology demand a constellation of characters as a basis for classification. Therefore, the more blood group systems that are utilised in the classification the better.

Wiener proposed a classification based in ABO and the Rh system, and distinguished three broad racial groups.

1. Caucasoid Group—with the highest incidence of cde chromosome, relatively high incidence of the chromosome CDe, and the gene A_2, moderate frequencies of the other blood group genes.

2. Negroid Group—highest incidence of the chromosome cDe, moderate frequency of the cde chromosome, high relative incidence of the genes A_2 and the rare intermediate A gene.

3. Mongoloid Group—virtual absence of the cde chromosome and the gene A_2, highest incidence of the chromosome CDE.

By making use of the data available for MN groups, Wiener further subdivided the Mongoloid groups into an Asiatic subgroup, a Pacific Island and Australian group, and a group including the American Indians and Eskimos.

Boyd[1] at a later date, and with more data available formulated a racial classification which resulted in six groups.

1. Early European possessing the highest incidence of the chromosome cde (over 30%), probably no Group B, relatively high incidence of the chromosomes CDe and the gene A_2. The gene N possibly somewhat higher than in the present day Europeans. This early European race is represented to-day by the Basques, a race now inhabiting the Western end of the Pyrenees; they are a race racially and linguistictly distinct from their French and Spanish neighbours.

2. European and Caucasoid Group possessing the next highest incidence of the chromosome cde, and a relatively high incidence of the chromosomes CDe, and the gene A_2; with moderate frequencies of other blood group genes. Normal frequencies for MN genes.

3. African or Negroid Groups. Possessing a tremendously high incidence of the chromosome cDe, a moderate frequency of cde, a relatively high incidence of the genes A_2 and the rarer intermediate A, a rather high incidence of the gene B and a probably normal MN frequency.

4. Asiatic (Mongoloid) Group—possessing high frequencies of the genes A_1 and B, the highest known incidence of the rare chromosome CDE, but little if any of the genes A_2 and cde. Normal MN frequencies.

5. American Indian Group—possessing varying incidence of genes A_1, no A_2, probably no B or cde, low incidence of the gene N. Possessing some CDE.

6. Australoid Group—Possessing high incidence of the gene A_1, no A_2, no cde. High incidence of the gene N with a correspondingly low incidence of the gene M. Possessing the gene CDE.

A lot of work is still to be done in the Pacific area.

In considering the Australian Aborigine, it is found that their MN frequencies are similar to those of the New Guinea natives, although they appear racially distinct—but they differ in that they have no Group B, whereas the New Guinea natives have considerable amounts of Group B, and on the discovery of Anti-S and its linkage to the MN blood group system it was shown then that although the MN groups were similar the MNS groups were quite distinct (2). The aborigines lack the antigen S, whereas the New Guinea natives possess it.

It therefore would appear that with improved blood grouping techniques, the use of a wider range of blood grouping sera as more blood group antibodies are recognised and identified—that racial classification on a serological basis will play a great role in future physical anthropology.

References:—

(1) Genetics and the Races of Man—Boyd (1950).
(2) Blood Groups in Man—Race and Sanger (1950).

NEW ZEALAND SOILS UNDER EXAMINATION FOR "WONDER DRUGS"

New Zealand has forwarded to America some fifty soil samples, which are to undergo tests for antibiotics that can be used in the treatment of human diseases or as plant and animal growth stimulants.

Soil is one of the most fertile sources of the micro-organisms used in the production of penicillin, streptomycin, terramycin, and similar antibiotics. A teaspoonful of soil from anywhere in the world may produce a known antibiotic more efficiently or a new one that will conquer infectious diseases such as leprosy, tuberculosis, undulant fever, typhoid and fungus infections, as yet resistant to treatment.

Many micro-organisms in soils produce some antibiotic substance, that is, a chemical restricting the activity of another organism. The possibility of an antibiotic being used to attack germs causing human diseases was realised by Sir Alexander Fleming in 1929 and lead to the discovery of penicillin. An intensive search has since been made for other antibiotics to attack germs unaffected by penicillin. Though a number have been found and a few are being given to patients, some are harmful in their present form and cannot yet be used.

American scientists are now conducting a world-wide search for new antibiotics. They asked the Soil Bureau, Department of Scientific and Industrial Research, to co-operate in obtaining samples of the "fine supply of soils from New Zealand". Sampling localities were selected, with the aid of the Soil Map of New Zealand, to cover a wide range of soils and vegetation. These localities are scattered from Northland to Southland and from the coastal districts to mountains, and Soil Bureau officers, tramping clubs, and others, assisted in collecting the samples. While it is not possible to predict the outcome of this investigation, a good coverage of New Zealand soils has been obtained with the minimum number of samples, and the American investigators will have every chance of finding if there is anything unique in New Zealand soils that can be used for human welfare.

(Press release from the Information Bureau, Department of Scientific and Industrial Research.)

SOME RECENT ADVANCES IN POLIOMYELITIS RESEARCH

A. M. Murphy

Pathology Department, Auckland Hospital

The recent epidemic of poliomyelitis in New Zealand has once again emphasised the fact that modern medicine has as yet had little success in the control of this disease. This is the only specific infectious disease of civilised countries which has not been influenced by improved hygienic conditions. In fact it may be said that with increasing living standards and public appreciation of hygiene the greater is the incidence of paralytic poliomyelitis. Recent research and epidemiological studies in the U.S.A. has provided an explanation of these facts and at the same time gives some hope for control of epidemics in the near future.

The poliomyelitis virus is one of the smallest of human pathogens, being about 1/50th of the diameter of a staphylococcus. Landsteiner and Popper, in 1909, were the first to inoculate monkeys with spinal cord of infected cases and produce paralysis. The fact that monkeys are the only experimental animal readily infected, has been the chief difficulty in laboratory investigations. The success of Armstrong in 1939 of transmitting one strain (Lansing) to cotton rats and from them to mice gave promise of a new method of approach, but this has not been as fruitful as expected. The recent work of Enders, Weller and Robbins, however, has materially altered the position, and control of poliomyelitis epidemics is now a definite possibility. These workers succeeded in 1949 of growing the virus in tissue culture.

Previous to this, however, a definite picture of the epidemiology of poliomyelitis had been established. Theiler in 1937 studied what he called mouse poliomyelitis sufficiently closely to enable a fair picture to be obtained of its life history. In an infected mouse colony baby mice become infected from food contaminated with the faeces of older mice. The virus lodges and multiplies in the mucosa of the upper intestine without producing any clinical symptoms. Theiler found, however, that occasionally a mouse would exhibit paralysis and he showed that the virus had passed to the central nervous system and attacked the anterior horn cells of the spinal cord.

Although paleopathological studies suggest that poliomyelitis was known as early as 1600 B.C., it was not until the latter part of the nineteenth century that epidemics were recorded in Scandinavia. At the beginning of this century the disease was almost wholly confined to children under the age of five years and was appropriately known as "infantile paralysis". Recent outbreaks,

however, have shown an increasing tendency to affect higher age groups in very close proportion to increased standards of living and hygiene. Where civilisation has lagged behind, infants are still the chief sufferers. In an epidemic in Malta in 1942-3 90% of the cases were in the under 5 age group. It would appear that poliomyelitis virus was freely circulating amongst the population of Malta previous to the epidemic and that the only non immunised persons were the very young. With the arrival of a virulent strain this was the group most affected. On St. Helena an epidemic occurred in 1946, and here the population had had no previous contact with the virus, with the result that the epidemic was spread over all ages with the greatest incidence in the 5-20 age groups. Thus the analogy with Theiler's virus becomes apparent. In the early years of this century with large families and non-existent nursery hygiene children were infected in their early years, the majority showing no symptoms, but the resulting immunity protected them against future infection. With increasing standards of living and smaller families, children today are not infected until they are of school age or even older, when the incidence of paralysis is much higher.

Many workers, however, consider that some change in the virus itself is responsible for the greater percentage of cases of paralysis. Burnet considers some genetic change in the virus has occurred in this century giving it a greater invasive power.

The most important question still unanswered is — what determines whether an infection will be subclinical or paralytic? For every case of paralysis in an epidemic the virus can be isolated from several hundred other individuals showing no symptoms whatever and indicating that the virus is freely circulating amongst the population. This question cannot be answered solely on considerations of immunity alone as apparently all non immune individuals do not exhibit paralysis as the result of infection. The invasive characteristics of the particular strain has been suggested as an explanation, although in any one epidemic this must surely be the same. Again the age and genetic characteristics of individuals undoubtedly play a part. The latter, however, is largely an unknown quantity. Finally there is evidence to suggest that administration of pertussis vaccine and tonsillectomy predisposes to paralysis and somewhat less evidence that trauma and gross over exertion may have a similar effect. Of these factors only the latter group are subject to any form of control and they play only a minor role in the disease.

Of the other steps that can be taken to influence the incidence of poliomyelitis, namely prevention of spread of the virus, chemotherapy and vaccination, only the latter provides a possible line

of attack. The fact that in any epidemic the virus can be isolated from many different sources, and that carrier states are common, emphasises the point that it is almost impossible to prevent the spread of the virus by any set of public health regulations, no matter how rigid.

As regards chemotherapy it seems at the present state of our knowledge that this may never be a success even if a potent antibiotic could be found. Once symptoms of paralysis are evident the peak of multiplication of the virus has in all probability passed and the anterior horn cells already damaged.

Immunisation by use of a living vaccine has now become a distinct possibility with the roller tube tissue culture method of Enders, Weller and Robbins. This provides a means of producing an antigenic variant of lowered pathogenicity which could be safely used in a vaccine and also a means of providing a potent source of living virus free of foreign tissue (particularly dangerous C.N.S. components). Growth of the virus in tissue culture is accompanied by cytopathic changes which are readily observed. Inhibition of these changes by the addition of specific immune serum provides the basis of an *in vitro* method for antigenic classification, and quantitative estimation of type specific antibody, thus making possible the *in vitro* serodiagnosis of poliomyelitis infection. This method has virtually replaced the cumbersome and expensive procedures required when studies are carried out in monkeys. Mass surveys of normal populations for neutralising antibodies can now be undertaken and the new information obtained may enable some prediction of epidemics.

Finally recent trials carried out by Hammon et al on the protective effect of gamma globulins in poliomyelitis give further hope for the future. Some 55,000 children were involved in the trial, one half received intramuscular gamma globulin and the other half (control group) received only gelatin. Between the second and sixth week after injection 6 cases occurred in the test group and 38 in the control group. Protection appeared to be short-lived, however, in spite of large amounts of gamma globulin given. To protect a large number of people in this way such enormous amounts of gamma globulin may be necessary as to require exsanguination of half the population to protect the rest. Nevertheless, this is the first prophylactic measure which has significantly reduced the incidence of paralytic poliomyelitis.

Junior members are reminded that entries for the Essay Competition close with the Secretary on 15th June, 1953. As usual there will be two sections, Essay and Technical Study. Any Junior member may enter for either or both.

INTERMEDIATE EXAMINATION

October, 1952.

WRITTEN PAPER

9.30 a.m. - 12.30 p.m.

1. Describe in detail one method for the determination of the total non-protein nitrogen of the blood. Indicate the possible experimental errors which may arise at each stage, and hence estimate the accuracy of the final result.

2. Explain briefly:—
   (1) The temperature regulating system of the 37°C laboratory incubator.
   (2) The optical system of the simple visual colorimeter, and the calculation involved in the determination of an unknown.
   (3) The meaning of the term pH, and a simple method of determining the pH of a specimen of urine.

3. What methods are available for the isolation of: —
   (1) Staph. aureus.
   (2) C. diphtheriae.
   (3) A Salmonella.
   (4) N. gonorrhoeae.
   (5) Br. abortus.

4. Outline the conditions pertaining to the artificial cultivation of bacteria in general.

5. What methods are available for sterilisation by heat.

6. Describe briefly your method for each of the following tests:—
   (1) Coagulation Time (on an out-patient).
   (2) Haematocrit.
   (3) Reticulocyte Count.
   (4) Eosinophil Count.

   What precautions in the collection of the specimen must be taken to obtain an accurate haematocrit result?

PRACTICAL PAPER

1. (a) Report on the three blood films provided. (*Normal Blood; Erythroblastosis; Infectious Mononucleosis.*)
   (b) Perform a routine white count and differential on the blood provided.
2. Perform a type and cross-type on the specimen of blood provided.
3. Test the urine specimen A qualitatively for protein, bilirubin, glucose and acetone. Determine by titration the amount of glucose present in specimen B.
4. Examine the specimen of faeces provided for occult blood. Determine whether the 5ml. pipette provided delivers exactly this volume of water.

5. Identify the crystals on slide No. 1 and the organisms on slides 2 to 6.
   (1) *Urine deposit.* (*Sulphonamide crystals.*)
   (2) *From a urine.* (*T.B.*)
   (3) *From an ear swab.* (*K.L.B.*)
   (4) *From Hair.* (*Small spored ringworm.*)
   (5) *From a sputum.* (*Yeast.*)
   (6) *From a cervical swab.* (*Gonococcus.*)

ORALS

Some of the questions asked were as follows:—

Optical system of a microscope; blood sugar estimation, theory of test and sources of error; methods of inhibition of B. proteus; definition of antigen and antibody; antibiotic sensitivities; methods of determination of pathogenicity of Stathylococcus aureus; anaphylaxis; determination of pH; oxidase reaction of Gonococcus; pyocyanase.

ISOLATION OF INTESTINAL PATHOGENS

F. M. Rush-Munro

(*Department of Pathology, Auckland Hospital*)

The following is a summary of the intestinal pathogens isolated during 1952 in the Bacteriology Department of the Department of Pathology, Auckland Hospital.

For faeces, the routine followed was an initial plating on to MacConkey agar, plus enrichment in Selenite F medium followed by plating on to MacConkey agar.

For blood cultures, bile broth was used initially with plating on to MacConkey agar.

The antisera used were obtained from the Standards Laboratory for Serological Reagents, Colindale, London.

S. typhi

Total no. cases	No. times isolated	Isolations blood	Isolations faeces	Isolations urine	Isolations gall bladder
15	82	7	67	3	4

One isolation from appendix.

Average isolations per case 5.5.

S. paratyphi A

Total no. cases	No. times isolated	Isolations blood	Isolations faeces	Isolations urine
18	43	12	29	2

Average isolations per case 2.4.

Salmonellae

Type	No. of cases	No. of times isolated	Average isolations per case
S. typhimurium	46	194 (faeces)	4.2
S. anatum	3	10	3.3
S. newington	2	3	1.5
S. cholerae-suis	2	4 (one isolation from heart blood and one isolation from gall bladder P.M.)	2
S. bovis-morbificans	1	3	3

Shigellae

Type	No. of cases	No. of times isolated	Average isolations per case
Sh. sonnei	29	46	1.6
„ flexneri Z	3	3	1
„ „ 88	4	5	1.2

Total isolations 383
Total number of positive cases 123
Average isolations per case 3.1

The S. anatum, S. newington, and S. cholerae-suis were kindly identified for us by Mr. S. W. Josland, of the Wallaceville Animal Research Station.

DEPARTMENT OF HEALTH

FINAL EXAMINATION FOR CERTIFICATE OF PROFICIENCY IN HOSPITAL LABORATORY PRACTISE

FEBRUARY, 1953.

Examiners: Drs. E. F. D.'Ath, P. P. Lynch, J. O. Mercer and M. Watt.

WRITTEN PAPER

9.30 a.m. — 12.30 p.m.

1. What are the practical applications of anaerobic culture in present day bacteriological work?
   Describe the anaerobic methods of culture in common use.
2. Describe how you would deal with a specimen of gastric juice submitted for examination for the tubercle bacillus.
3. Write a concise account of each of the following:—
   (a) A normal solution.
   (b) Silicone.
   (c) Complement.
   (d) The decalcification of surgical specimens.
4. Describe the laboratory control of anticoagulants.

PRACTICAL PAPER A

9.30 a.m. - 12.30 p.m.

1. Report on the following fixed and unstained smears and state what further steps should be taken to substantiate your diagnosis in each case:—
   (a) From a urethral discharge. (*Gonococcus.*)
   (b) Guinea-pig peritoneal exudate. (*Anthrax.*)
   (c) Urine, centrifuged deposit Z.N. (*Tubercle bacillus.*)
   (d) Sputum for Gram stain only. (*Pneumococcus.*)
   (e) Throat swab for Gram stain only. (*Vincent's Organisms.*)
2. Report on the cultural characteristics and morphology of the organisms in the following cultures:—
   (a) Blood agar—from a skin lesion. (*Staphylococcus aureus.*)
   (b) Broth—from a discharging sinus. (*Streptococcus.*)
   (c) Cooked meat medium—from a wound. (*Cl. welchii.*)
   (d) MacConkey—from faeces. (*Gram negative bacillus.*)
   In each case state briefly what further steps should be taken to identify the organism.

3. How would you perform a test for occult blood in faeces? What chemical principles underlie this test?
4. Outline the method of preparation of:—
   (a) A haematoxylin stain for histology.
   (b) Leishmans stain.
   (c) Nessler's reagent.

PRACTICAL PAPER B

2 p.m. - 5 p.m.

1. Identify the specimens a-h and state briefly the points upon which you make your identification. (15 minutes allowed for this question.)
   (*a*) *Ascaris ovum.*
   (*b*) *Trichuris ovum.*
   (*c*) *Trichinella spiralis.*
   (*d*) *Trypanosome.*
   (*e*) *Louse.*
   (*f*) *Nematode worm.*
   (*g*) *Oxyuris vermicularis.*
   (*h*) *Ascaris.*
2. Examine the stained blood films and report on each one. Make a differential count on film I.
   (*I. Myelogenous leukaemia.*
   II. Chronic lymphatic leukaemia.
   III. Infectious mononucleosis.)
3. Examine and report on the deposit of the specimen of urine provided. (*R.B.C.'s. Casts Uric acid crystals.*)
4. This is the fluid obtained upon thoracic puncture. Examine microscopically and report upon it. (*Cysts and scolices of Echinococcus.*)

ORALS

Some of the questions asked were as follows:—

Dr. Watt:

Microscopes; types of cotton wool; absolute and methyl alcohol; autoclaves and sterilisation; Gram staining.

Dr. D'Ath:

Histology and staining; use of bacteriostatics; intravenous solutions; stills; pyrogens; packed cell volume; gastric analysis; molar solutions; RBC. and Hb.; laboratory apparatus; colorimeters.

Dr. Mercer:

Diphtheria; spectrophotometers; blood calcium; sections; Coomb's test direct and indirect; blood sugar; spirochaetes; collection of material for dark ground examination; microtomes; stills; packed cell volume; routine Hb.; B.S.R.

Dr. Lynch:

Red cell fragility; haemolytic anaemias; blood calcium; T.N.P.N.; tetanus; blood sugars; protein precipitants; autogenous vaccines; smallpox vaccine.

Members are reminded that Annual Subscriptions are now payable. They should be sent to—

Mr. H. G. T. Olive

Treasurer

N.Z. Association of Bacteriologists, (Inc.)

Pathology Department

Public Hospital, Wellington

Printed by Percy Salmon, Wills & Grainger Ltd., 64 Fort Street, Auckland, and published by The New Zealand Association of Bacteriologists.