Vol. 2—No. 3. OCTOBER, 1947.

JOURNAL

of the

NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

Published by the New Zealand Association of Bacteriologists (Inc.), Wellington, New Zealand

JOURNAL

of the

NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

Vol. 2—No. 3. OCTOBER, 1947.

CONTENTS:

Communications regarding this *Journal* should be sent to the Editor, Mr. D. Whillans, Pathological Department, Public Hospital, Auckland, C.3.

All monies should be paid direct to the Secretary-Treasurer of the New Zealand Association of Bacteriologists (Inc.), Mr. D. H. Adamson, c/o Pathology Department, Public Hospital, Christchurch.

Subscription to this *Journal* is 5/- per year or 1/6 per copy, post free.

JOURNAL

of the

NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

Vol. 2—No. 3. OCTOBER, 1947.

EDITORIAL

It is something to have passed our Third Conference, and it is heartening to those who have worked so hard in the past several years to mark the unity of thought which characterises the Association.

We will look forward with the greatest of interest to the practical outcome of the New Hospital Board Employees (Conditions of Employment) Regulations 1947, and hope that with this, some of the anomalies which have arisen will be rectified. For our part we wish to assure the authorities of our anxious desire to co-operate to the utmost so that the Profession can take its full share of responsibility in guarding the health of the people.

It behoves us, too, not to let our interest lag now that the novelty of forming an Association is over, but to all put in the hard work without which the striving after better status and conditions is meaningless.

THE Rh FACTOR

DR. C. T. B. PEARSON

From the Pathology Department, Public Hospital, Christchurch

In 1940 Weiner and Peters announced the discovery of a previously unknown agglutinogen in human red cells. This was designated the Rh factor owing to its presence in the red cells of the Rhesus monkey. It was further discoverd that, of white people, approximately 86 per cent. possess this agglutinogen (and are hence Rh positive) while the remaining 14 per cent. do not (and are hence Rh negative).

Following the discovery of the Rh factor, it was found that this factor would explain a large number of reactions following the transfusion of apparently compatible blood. The persons who developed these transfusion reactions could be divided into two classes:—

(1) Those who had had previous transfusions.

(2) Those who had not had previous transfusions. In this group all the patients were women, and they had all recently been confined.

In all these cases an atypical agglutinin was found in the patients'

serum and this agglutinin was found to be anti-Rh in type; that is, it acted on red cells containing the Rh factor. It was also noted that the majority of the women who had reactions following a first transfusion had given birth to infants suffering from erythroblastosis. This term erythroblastosis does not mean a specific disease entity, but includes the clinical conditions hydrops foetalis, icterus gravis, and haemolytic anaemia of the newborn. These three conditions are severe, moderate, and mild forms of erythroblastosis respectively.

93% of the mothers of erythroblastotic children are Rh negative—a striking contrast to the 14% Rh negative in a random selection of the white population—and all the fathers are Rh positive.

It has been shown that the Rh factor possesses good antigenic properties and is thus capable of giving rise to antibody formation.

To fit these facts the following theory was evolved:—

The father is Rh positive; the mother Rh negative. As the Rh factor is transmitted as a Mendelian dominant the affected infant is Rh positive.

It is known that, during pregnancy, some of the placental villi may break off into the maternal circulation. Bleeding occurs from these villi and so foetal red cells escape into the maternal circulation, and being Rh positive and antigenic give rise to Rh antibodies in the mother. These antibodies pass back through the placenta to the foetus in which they give rise to erythroblastosis. As the Rh antibodies are also circulating in the mother's blood a haemolytic reaction will be produced if she is transfused with Rh positive blood.

In addition, if an Rh negative person is transfused with Rh positive blood Rh antibodies are produced, which will give rise to a haemolytic reaction if a further transfusion of Rh positive blood is given.

So far the Rh factor has been described as a single entity, but in practice it is found that there are seven Rh antigens, which, including "Rh negative," give rise to eight subtypes, thus:

Rh negative	14%
Rh′	1.5 %
Rh″	0.5 %
Rho	2.5 %
Rho′	54.5 %
Rho″	14%
Rho′ Rho″	13%
Rh′ Rh″	0.01%

Excluding Rh negative these are all made up of various combinations of Rh′, Rh″, and Rho.

As a consequence of these subtypes there are two facts of practical importance:—

(1) A person who belongs to any one subtype can still be immunised against any other subtype which he or she does not possess.

(2) Any one Rh antibody will not detect all Rh positive persons.

It will be seen from the table that 84% of the population contain the gene Rho in their cells. Therefore an anti-Rho serum will show 84% of the population as Rh positive.

Similarly anti-Rh′ and anti-Rh″ sera will show 69% and 27.5% respectively of the population as Rh positive.

Ideally when testing for the Rh factor anti Rho, anti Rh′, and anti Rh″ sera should all be used, but in practice anti-Rh″ serum is very uncommon and the two used are anti Rho and anti Rh′. These will detect all Rh positive persons except those who contain only Rh″ in their red cells (.05% of the population).

As an ideal all persons who are to receive a blood transfusion should be Rh typed, but owing to the difficulty in obtaining suitable antisera, typing is only carried out in selected cases.

These cases are selected when there is a history of

(1) Repeated transfusions (more than seven days previously).

(2) Transfusion reactions.

(3) Abortions or stillbirths.

(4) Infants who suffered from severe jaundice, anaemia or oedema.

There are several methods of performing Rh typing, of which the following are the most useful:—

(1) Wiener's Conglutination test.

(2) The capillary tube method.

For the detection of Rh sensitisation, that is the presence of Rh antibodies, these two tests can also be used as well as Diamond and Abelson's Open Slide test. It is essential when performing any of these tests to use controls with known Rh positive and Rh negative blood. If Rh positive antibodies are found in any patient's serum a series of doubling dilutions should be made in order to estimate the titre of these antibodies.

In New Zealand this is of special significance as practically the only way to obtain anti-Rh sera here is to obtain it from the mothers of infants suffering from erythroblastosis. The Rh subtype of any serum which is to be used for routine Rh typing must also be determined, as if it contains only anti-Rho, an anti-Rh′ serum must also be obtained as well, and if one is very lucky an anti-Rh″ serum may also be obtained.

An anti-Rho′ serum will detect 85.5% of the population as

Rh positive; the remaining 0.5% (those who conta' nly Rh″ in their red cells) showing up as Rh negative. s is of no practical importance as if routine Rh typing is c d out befo transfusion these persons will consequently h ransfused wi Rh negative blood, and hence there is no risk of an haemolytic reaction.

The diagnosis of erythroblastosis is usually made clinically. Infants with hydrops foetalis nearly always die in utero or shortly after birth. In other cases the infant becomes rapidly jaundiced and/or anaemic shortly after birth. In these cases if a blood film is made and examined and found to contain more than 1000 nucleated red cells per million red cells, then the diagnosis is practically certain, sufficiently so for preparations to be made for transfusion with Rh negative blood. If, in addition, the mother is found to be Rh negative then the diagnosis is even more certain. Even if the mother is sensitised to the Rh factor Rh antibodies may not be found in her serum at childbirth, but if tested two-three weeks later they will usually be found. It should also be pointed out that the absence of erythroblasts in the infant's blood film does not exclude a diagnosis of erythroblastosis.

Once a diagnosis of erythroblastosis has been made preparations for transfusion with Rh negative blood must be made as it is not unusual for the infant to be apparently fit and well and then to become suddenly anaemic within a matter of hours.

It is usually considered that the infant's blood count should be maintained at five million red cells, but recently it has been suggested that a count of 3.5 million is satisfactory and certainly infants in this hospital whose count is kept at this latter figure by repeated transfusion do very well.

Diamond advocates the technique of replacement transfusion by which 80% of the infant's red cells are replaced by Rh negative red cells. This is a rather tedious procedure and certainly, in theory, appears very good. It must be carried out, however, within 24 hours of birth.

Rh sensitisation of any Rh negative person by transfusion of Rh positive blood can be prevented by routine Rh typing, but as far as Rh sensitisation of the mother, and consequent erythroblastosis in infants is concerned, prevention is not possible.

Routine Rh typing of all persons who are to be transfused is the ideal, but owing to the shortage of anti-Rh sera selected cases only are typed, and especially those in which there is a history of

(1) Repeated transfusions.
(2) Stillbirths and/or abortions.
(3) Children who suffered from any of the manifestations of erythroblastosis.

REFERENCES.

An excellent list of references will be found in the article by Hallwright (1946) N.Z.M.J. **46,** 245.

More recent ones are:—

Hill and Haberman (1946) J. Lab. & Clin. Med. **31,** 1053.

Murray (1946) Brit. J. Exp. Path. **27,** 102.

Parsons (1947) Lancet, **1,** 815.

Wiener (1946) Amer. J. Med. Tech. **12,** 95.

Wiener (1946) J. Lab. & Clin. Med. **31,** 575.

JUNIOR PRIZE ESSAY, 1947

THE FUTURE OF THE BACTERIOLOGIST IN NEW ZEALAND

R. BRIDGER

(*From the Pathology Department, Public Hospital, Christchurch.*)

Laboratory medicine is as yet in its infancy—the foster child of mother Medicine, and as yet a problem child. Where will it end?

Its beginnings were a little less than one hundred years ago. The rise of scientific Bacteriology and Immunity was due to Pasteur between the years 1860 and 1885. Koch placed the science on a firm technical basis between the years 1878 and 1885. After these two monumental figures its development was rapid until its climax came in the evolution of the science of Immunity. Thus were the fundamentals of Bacteriology laid.

At first Bacteriology had difficulty in standing its ground against the prejudices of the medical profession who labelled it a fad. Time, however, showed them their error and the thinking men amongst them began to realise its potentialities. From a profession in which clinical experience was the criterion, Bacteriology showed the way to vast fields of diagnosis and later treatment, enabling them to grasp the intangible microscopic world in which lay the answers to the one-time insoluble riddle of the origins of disease.

Permanent laboratories in hospitals came at a later date and it was not until 1908 that the first one was set up in New Zealand. These were our beginnings.

Although in a state of flux the work of personnel in hospital laboratories is still strictly technical, not requiring any particular knowledge outside Bacteriology. The final word in all these matters is always referred to a Pathologist or in smaller establishments to a senior medical man. In larger hospitals Laboratory medicine is divided into departments each of which is staffed according to the amount of work done. This demands that in order to have sufficient technical training persons from a smaller hospital must spend a specified period in a larger one before sitting the qualifying examination. Even today it is a matter of difficulty

for Hospital Boards to recognise unanimously this most important matter of interchange.

The examination system is also in a state of revision and, recognising the need for higher specialised educational training, a proposed Intermediate Examination should soon be appearing. This, coupled with a higher standard in the final examination, points to a larger and more comprehensive knowledge by the persons engaged in this work.

This is, however, merely the first of the steps which a Bacteriologist must take to fit into the expanding science of Laboratory Medicine. Medicine itself, had, like every other profession, a period of apprenticeship — a period in which men of lesser knowledge gave their inadequate but much-needed assistance to the peoples of the world. Its origins were humble, but its results, manifested around us every day, were great. It is only logical to conclude that this must apply also to Laboratory medicine in a modified degree.

The main expansion will, of need, consist mainly of the results of researches into preventive medicine and immunity. Much of the purely technical side will be taken care of by mechanical means, *e.g.,* experiments on electronic machine for blood counts are even now showing good results in America.

It is in these new fields that the Bacteriologist will have to derive his learning and widen extensively his general medical knowledge so that his application may be more complete. This does not include an encroachment on the medical man's ground, as there is much scope for both Doctor and Bacteriologist in the Laboratory of the future. A new generation of medical men is arising, men who are realising the real need and correct use of Laboratory medicine without sacrificing in any way their clinical teachings.

The examination system will in time be altered radically. Registration will become a necessity, and as the need arises a wider examination system. Eventually a Diploma should be instituted with a representative number of smaller examinations leading up to final examinations as in other professions. Departmental examinations should come under this category, *e.g.,* papers in Bacteriology, Haematology, Biochemistry, etc.

Later these must be supervised by senior Bacteriologists who will also set them, and later still the eventual outcome—a Chair of Bacteriology in the Universities to cater for a Degree course in the Science. This should be the educational aim of the future.

Our Association will expand and with increased funds at their disposal should be able to advise and direct the work of its members and foster schemes of individual and group research and laboratory work. A travelling representative should be endowed with the power to keep a check on members' work and

consult with the senior staff in every laboratory to arrange such things as interchange.

Increased meeting power is a nearer and more important issue and a central meeting place should be arranged as soon as funds and conditions allow, for it is only from these that interchange of ideas and study of new research methods can be disseminated.

As the world at large accepts new ideas in the science, men should be able to travel overseas and study in both technique and research at first hand in various international centres.

Hence from this brief resume it can be seen that with the expansion of laboratory medicine and the rise in its members' knowledge, the work will no longer be purely technical, and we can look forward to a new era when the Bacteriologist will become a respected, knowledgable, adequately-salaried and independent professional man, his technical attributes not submerged in any way, but supplemented and improved by newer methods. A member of a profession working side by side with the medical man and helping to keep a finger on the pulse of humanity's ills.

INDUSTRIAL MICROBIOLOGY

DR. M. G. SOMERVILLE

(From the Pathology Department, Public Hospital, Christchurch.)

Industrial Microbiology is the study of those micro-organisms which have been harnessed for such useful purposes as the fermentation industries, cheese production, citric acid manufacture etc., and the study and control of those organisms which cause spoilage of foodstuffs and cause wastage in industry.

Some years ago Canterbury College started a course of Industrial Chemistry, and one of the subjects lectured in is Industrial Microbiology. The Industrial Microbiology lectures are held in the Pathology Department and consist of some forty lectures and practicals. Dr. K. Uttley (now at Timaru) started the lectures and I have carried on since he left. The subject Industrial Microbiology can now be taken as a degree subject of the University of New Zealand.

The course consists of general Bacteriology and Mycology with the technique of examination of materials and culture of the same. It then goes on to deal with the yeasts, moulds and bacteria, their characteristics and practical applications. A large sector deals with sterilisation and disinfection with reference to applications in industry. Milk, water and air bacteriology are discussed as well as canning, cheese production and textile and wood microbiology.

I shall now go on to mention some of the points which may be of interest to you in this field. First, I shall deal with a few of the practical applications of the Fungi.

Citric acid you all know well. It is now mainly produced by mould fermentation. Up to 1925 Italy was the world's greatest producer, but after that date the U.S.A. and later Great Britain and Continental countries started to produce it by using sugar solutions which were fermented by various Aspergilli, Penicillia and Mucors.

Gluconic acid is produced by the fermentation of refined cane sugar by Aspergillus niger. Lactic acid (Dextro-rotatory) is produced by Rhizopus oryzae using glucose, urea and calcium carbonate as the substrate. It is interesting to note that various Aspergilli and Penicillia can produce fat when grown on suitable media. The mould grows as a thick felt which is extracted with alcohol. I am sure that Germany used this method to produce fat during the recent war. Takadiastase, Digestin and Polyzyme, which are common stomach remedies are mould enzyme preparations

There are two main methods of mould fermentation. The first is the surface culture where the medium is placed in shallow trays and the mould grows on the surface. The second is submerged culture where the fermentation is carried out in large drums or vats. The first process is slow and costly and infection by extraneous organisms hard to prevent. The second process is more economical and quicker. It is no wonder that in Penicillin manufacture the second method is rapidly superseding the first.

The most important practical application of the Bacteria are first the production of acetone and butanol by the fermentation of corn sugar, corn sugar and starch, Jerusalem artichokes or sulphite liquor by various Clostridia. The latter substance is a waste product of the pulp industry which can be profitably utilised. During the First World War, C. Weizmann discovered a Clostridium which would complete the above fermentation much more economically that any previous organism discovered. The Allies were short of acetone at this time and induced Weizmann to turn over his process to them. It is rumoured that the price was a home for the Jews in Palestine, and Weizmann later became the head of the Zionist Movement of Palestine. Acetone is used for making explosives, and after the war, when acetone was not in great demand, the production of butanol was increased. Butanol is changed to butyl acetate which is used for lacquers.

The second example I wish to give you is the use of others of the Clostridium group, namely B. macerans Cl. acetoethylicus which will ferment corn cobs, oat and peanut husks to form acetone and ethyl alcohol. This is another example of the utilisation of a waste product.

The third example of bacterial fermentation is the production of vinegar by various acetic acid bacteria. This fermentation is carried out in two parts. First malt, honey, sugar, etc. is fermented by yeasts to alcohol, which is then fermented by the bacteria to

form vinegar. These same acetic acid bacteria can cause spoilage in the Wine industry, causing the wine to become flat and sour. In New Zealand the vinegar is mainly malt vinegar, malt being the original substrate but I have tasted some very nice honey vinegar in the south of the South Island.

The lactic acid bacteria deserve a brief mention. They are used in cheese production and in the production of either dextro-rotatory or laevo-rotatory lactic acid. Lactobacillus bulgaricus was well known some years ago as a possible cause of a ripe old age!

The Clostridium group is again of practical importance in the retting of flax. These organisms attack the pectin of the fibres, so loosening them into threads which can be finally separated by machines. This is what is happening when you see flax lying on the ground.

The practical applications of the yeasts are perhaps the most important group of all for on these organisms depend all the fermentation industries. The yeasts are one group of Molds but for practical purposes are separated from them. There are many hundreds of yeasts. Selected strains of yeasts split sugar into carbon dioxide and ethyl alcohol. It must be remembered that all these (as well as other) fermentations are carried out by enzymes which are secreted by the cell concerned.

(To be continued.)

THIRD ANNUAL CONFERENCE, 1947

This was held in room 3 of the School of Nursing, Christchurch Hospital, and was opened at 9.30 a.m. on Friday, 18th July, 1947.

There were present as delegates the following: Mr. J. C. Thompson (Invercargill), Mr. L. B. Fastier and J. A. Samuel (Dunedin), Mr. K. B. Ronald (Oamaru), Mr. H. A. Ward (Timaru), Miss F. H. MacDonald (Greymouth), Miss B. McKenzie, Mrs. T. J. Robertson, Mr. J. T. Murray, Mr. D. H. Adamson, Mr. N. B. Gibson and G R. Rose (Christchurch), Mr. V. J. Hawke (Nelson), Mr. K. G. Clarkson, H. Olive and D. Burt (Wellington), Mr. I. W. Saunders (New Plymouth), Mrs. D. Moroney (Hastings), Miss E. M. Partridge and Mr. E. L. F. Boxton (Wanganui), Mr. W. Carruthers (Gisborne), Mr. J. J. G. Peddie (Wallaceville), Mr. S. O. Jarratt (Palmerston North), Mr. G. W. McKinley (Waipukurau), Mr. G. R. George (Rotorua), Miss B. E. Tracy, Miss K. Riley and Mr. M. N. Keenan (Hamilton), Mr. D. F. Creed and D. Whillans (Auckland), and Mr. H. L. Haden (Whangarei).

Dr. A. B. Pearson, Pathologist and Director of the Christchurch Pathology Department, welcomed the delegates to the first Conference in the South Island. He said that he had noted with interest the rapid growth of the Association and congratulated the Association on the choice of papers to be presented at this Conference. He then outlined the progress of Laboratory work in this country especially from his arrival in 1912 and regretted that his old friend Tom Ross had died only three days before the Conference, while still in harness. He then paid tribute to the work of the Bacteriologist in New Zealand laboratories and stressed the vital part played by the Association in bringing about greater co-operation in the medical profession, and wished the Conference every success, and

its members an enjoyable visit.

Mr. Buxton (President) in replying, thanked Dr. Pearson for his remarks, assured him of the Association's co-operation, and asked that in the future we might have closer personal contact with the Pathologists on matters which the Association wished to discuss.

Mr. L. A. Bennett, Senior Surgeon, then formally opened the Conference, saying that it gave him great pleasure to do so for three reasons:—

Firstly, it was always an honour to represent the medical profession; secondly, he was happy to renew old acquaintances; and thirdly, he was glad to have the opportunity of telling the Delegates how much Bacteriologists were regarded as part of the Hospital team. He stressed the importance of series of normals and routine tests, the importance of small details and the part of the Bacteriologist in striving for the possible of 100 per cent. cure of patients. He assured the meeting of the greatest support from the medical men and concluded by wishing the meeting success in its full programme.

Mr. Buxton thanked Mr. Bennett for his remarks, which he fully supported, and Dr. Pearson and Mr. Bennett then retired from the meeting.

Mr. Buxton then announced to the delegates the death of Mr. T. A. Ross, who had been with Dr. Pearson at Christchurch for almost 33 years, and asked the members to stand in sympathy with his relatives and out of respect for one of the eldest and most highly regarded members of the profession.

Apologies were received from Messrs. N. J. Ellison (Wellington), J. Smith and L. G. Eccersall (Waikato), R. D. Aitken and A. M. Murphy (Auckland), J. Pierard (Wellington), A. Logan and M. Morris (Dunedin), M. O. Ekdahl (New Plymouth), and Miss J. H. MacDiarmid (Palmerston North).

The Annual Report and Balance Sheet were adopted by the meeting. In regard to the balance sheet, he explained that the working balance at March 31st last was only £7/1/-, but that the heavy expenses incurred during the year in the purchase of the printing press would not re-occur for some time, and that the assets were sufficient to maintain a healthy state of finance.

In opening the subject of the proposed Professional Syllabus for discussion Mr. J. J. G. Peddie explained the work of the committee in compiling this. The Secretary then read the relevant correspondence from the D.G.O.H. in which it was stated:—(1) That the proposed title had been changed to "Proficiency in Technique," to which serious objction could be taken in view of the fact that we were granted the status of a profession and that "technique" seemed to relegate the status to that of mere technician. (2) That the Pathologists would not accept a fully detailed syllabus, but preferred one with broader outlines to be used as a guide. (3) That in consequence of this a new syllabus was to be drawn up. (4) That there was every possibility of two examinations per year being held, one each in both South and North Island.

(Mr. Whillans remarked that it was expected that our syllabus would be used as a base for the new one, and that he was not in favour of too vague an outline as otherwise it was difficult to find some practical limit to the amount required to be known, and that University Calendars were quite specific in their requirements. Mr. Creed and Mr. McKinley said further that they had been asked to carry out procedures not in the syllabus, *e.g.*, Kahn tests and the microscopic examination of histological sections. Mr. Samuels was glad to hear that more than one examination a year was intended, and thought that having the examination in another centre would tend to raise the standard. Mr. Fastier questioned the advisability of holding it in other centres, to which Mr. Whillans replied that it was not intended that it should be held by other than University examiners, and would be in one of the University centres.)

The Secretary then asked if the members were prepared to accept

the Pathologists' ruling on the title of the Syllabus. General discussion took place, and Mr. Ward moved that "It is the unanimous opinion of this Conference that the title of the Professional Syllabus be the 'Certificate of Bacteriology and Clinical Pathology' and that the words 'Proficiency in Technique' be deleted." It was also agreed that the D.G.O.H. and the Pathologists be approached in this matter and if possible they should receive a deputation from members of this Association. Mr. Ward moved that a committee consisting of Messrs. Buxton and Whillans be appointed to act in this matter.

At this stage the Chairman of the North Canterbury Hospital Board entered and welcomed the delegates, and left after a few well-chosen words.

Mr. Saunders then introduced the Third Year Syllabus, and detailed the work of his sub-committee on this subject.

(Mr. Peddie considered that this was an internal matter, that the Association could deal with it, and that it did not need the official recognition of the Pathologists. Mr. Saunders disagreed and said that recognition would bring important changes in salary scales and allowances of time when training was continued in a base laboratory. Mr. Whillans pointed out that with the Senior Syllabus in a state of flux it was unlikely that the Pathologists would agree to the fixing of the Junior Syllabus. The Secretary considered that it was our own affair, but that if we could get official recognition so much the better.)

Mr. McKinley then moved that "The deputation to deal with the Senior Syllabus should also deal with the pressing need for recognition of the Intermediate Syllabus at the same time."

Mr. Adamson then introduced the question of Salary Scales, explained the preliminary work, and passed the matter over to Mr. Buxton, who gave the findings of the special sub-committee of himself and Mr. Whillans. (See last *Journal*.)

Mr. Fastier was amazed to see that no extra provision had been made in the scale for those members who possessed a degree, and invited discussion on the matter. Mr. Buxton considered that the allowance of two years in training time and the possession of a degree would probably qualify them for the highest salaries, provided their work was satisfactory. Mr. Fastier wished to know if time off was generally allowed off for degree training. Mr. Buxton said that this was a matter for the local Boards, but that this was generally granted.

Mr. Whillans said that this was a difficult matter in view of restricted space in laboratories, and the large amount of work being performed, but spoke from his own experience. He considered that a degree man needed a good three years' experience, and if their character was satisfactory would appreciate a few months' experience at such jobs as bottle washing, etc, and that unless we wished to disrupt the Association we should not make too much difference in the salary scale. Mr. Olive remarked that at the recent examinations there seemed to be a leaning towards the graduate. Mr. Fastier was all in favour of the graduate starting at the bottom, and was the last to wish a split in the Association. Mr. Samuel stated that two girls with Home Science degrees were recently taken on the staff at Dunedin and asked what degrees were recognised. The Secretary stated that the official Health Department ruling was that only Science degrees were to be considered. Mr. Whillans considered Chemistry III to be almost essential and would like to see Zoo II, Maths and Physics I. Mr. Murray, on being pressed, stated that Biochemical positions must of necessity be taken by degree people, but was still amazed at having the same scale for both classes. He felt that there should be some compensation for the difficult process of obtaining a degree and that to a non-degree person accuracy seemed relatively unimportant. Mr. Whillans pointed out that for one thing a degree person would get £50 for being in charge of a department. Mr. Buxton closed, saying that to him it seemed that the scale was in favour of the Science graduate.

Mr. Adamson then moved "That the letter and report is accepted, and that the Proposed Salary Scale, as amended by the Council from that set out by the sub-committee, be received."

Mr. Buxton then introduced the sickness survey for discussion. He said that he felt that some of the cases were due to crowded working conditions, unsafe technique and excessive overtime worked by some laboratories. General discussion took place, the members being most concerned by the findings. Mr. Gibson moved "As a motion from this Conference, the Hospital Boards' Association and the Pathologists be asked to institute further safeguards to laboratory workers' health: and that in view of the incidence in laboratory staff, we recommend to the D.G.O.H. and H.B.A. that all laboratory workers, before taking up their duties, be fully medically examined and that they have a chest X-ray at least every six months."

(Mr. Buxton: It was carried at the H.B.A. Conference that Tb. is an occupational disease in *all* hospital staff. During discussion it was found that two weeks' sick leave per year was not universal, and the President referred all members to their respective Hospital Boards.)

The Editor presented the report on the *Journal* and lodged an earnest appeal for material as so far the articles had comprised work done in the Auckland Hospital Laboratory almost entirely. He paid tribute to the help he had had from the Auckland Lab. staff and in particular Mr. Ian Cole. Shortages of gas, electricity and paper had been troublesome, but the results were worth while, as the *Journal* was a useful medium for putting forth our views to the pathologists, Hospital Boards, and others. (Mr. Murray as curator of the Canterbury Medical Library complimented Mr. Whillans on the excellent work he was doing, and Mr. Ronald, Mr. Carruthers and others spoke in similar vein. Mr. Buxton asked for subscriptions to the Publishing Fund and backed Mr. Whillans in his appeal.)

The President then read to members the comments of the Judge on the four papers entered for the Junior Essay competition. The judge, who was anonymous, found his task very difficult as the papers were of so diverse a nature. The subjects were: "The History of C. diphtheriae," J. Walsh; "The History of the Classification of the Streptococci," A. Murphy; "The Weltman Reaction," J. Cole; "The Future of Bacteriology in New Zealand," R. Bridger. The names of the entrants were unknown to the judge, who decided that Mr. Bridger was the winner. Mr. Buxton then presented the cash prize of £2/2/- from an anonymous donor. The Secretary/Treasurer on behalf of the Association thanked the donor for encouraging this worthwhile object among the juniors. (Mr. Whillans suggested that in future the essay competition be divided into two parts, one literary and the other technical.)

Mr. Bridger then spoke on behalf of the Junior members and outlined their difficulties and their appreciation of the work done by the Senior branch under the following headings: (1) Training; (2) The work of the Association; (3) The Journal; (4) the Salary Scale, and (5) Junior representation. Under training he considered the theoretical background insufficient and said that an Intermediate Examination would be a most welcome feature. He said that the Juniors were solidly behind the work of the Association and hoped to take a more active part in the future. In regard to the *Journal*, he thought that the policy was good, although the Juniors could not take a very active part in the production of long technical articles. He spoke of the juniors' appreciation of the inclusion of boarding allowance in the proposed salary scale, and said that it would make a lot of difference in being able to purchase books and in general make life a bit easier for such members. He hoped that some arrangement could be made for junior representation as it seemed to him that the Seniors' appreciation of Juniors' troubles tended to be dulled by the passage of years. The President intimated that a Junior advisory committee would be set up.

Mr. Buxton then brought up the question of non-technical assistants for discussion and it was unanimously approved on a motion by Mr. Saunders that "Those Non-technical assistants who, in the opinion of the Council of the Association are deemed worthy, should be admitted as Junior members."

Mr. Burt brought up the question of overseas bacteriologists. He stated that he had a South African Diploma of Bacteriology and had been required by the D.G.O.H. to perform one year's work under a Pathologist before sitting the New Zealand Examination. However, on doing this he was not permitted to sit and thought this unfair in view of the fact that the South African Medical Technologists' Association was affiliated to the equivalent association in the United Kingdom. Mr. Buxton stated that he had been assured that anyone holding the three English Certificates would be allowed to qualify without sitting.

Mr. M. Kirley moved "That the incoming executive is hereby asked to investigate Mr. Burt's case, and, if satisfactory, to press for recognition by the pathologists; and that some form of reciprocal agreement be asked for N.Z. members overseas."

Mr. McKinley said that he would like the Executive to find out how the English, South African and New Zealand Associations compared in training standards, and how we were regarded overseas. He thought that more communications would be beneficial to us.

The election of officers for the year then took place. They were: President, Mr. E. L. F. Buxton: Vice-presidents, Mr. G. W. McKinley and D. Whillans: Hon. Secretary-Treasurer, Mr. D. H. Adamson; Council members, Messrs. N. J. Ellison, J. H. A. Ward and S. O. Jarratt. Hon. Auditor, Mr. Stewart. Overseas corresponding member, Miss J. Byers.

A number of matters then came up for discusson. Mr. Buxton pointed out the many mistakes in the notes on Bacteriological Training in Careers for Boys and Girls, an official Education Department booklet, and undertook to present the true picture to the authorities. Mr. Haden reopened the question of refresher courses by asking if Auckland could take a constant stream of "refreshees." Mr. Whillans replied that he was not officially entitled to reply, but said there seemed no reason why a reasonable number could not be managed, but wished members to realise that this was definitely a waste of time to the training laboratory, as although the "refreshees" were experienced, their help was not as great as the time spent on them. He did not wish to sound unhelpful and realised that this was one of the means by which the profession could be kept up to date. Mr. Adamson supported these views. It was pointed out that the Board who sent the 'refreshee" paid all his expenses and should realise the value of the course. Mr. Ward moved "That the Council be asked to endeavour to arrange for refresher courses for all Senior Members every five years and that the course be of not less than three months' duration."

The following were appointed to the Junior Advisory sub-committee: Mr. I. M. Cole (Auckland), Mr. D. J. Burt (Wellington), Mr. R. Bridger (Christchurch-Convener), Miss M. Scott (Dunedin), Miss B. E. Tracey (Hamilton), Mr. C. E. Felmingham (Palmerston North), Miss I. Munro (Waipukurau), Mr. A. L. Schwass (Nelson).

Several other matters brought up by Mr. Jarratt were referred to the new council with power to act as the time was late. These were (1) The question of registration and (2) the question of patenting the letters N.Z.A.B. (a suggestion of Mr. Jenner, of Dunedin).

The meeting then concluded at 5.35 p.m.

Beginning at 7.30 p.m. the following papers were presented:—

The Rh factor and the Blood Bank (Dr. C. T. B. Pearson).

The Cultivation of Trichomonads (Mr. L. B. Fastier).

The Effect of Temperature Variations in the E.S.R. (Mr. D. H. Adamson).

and on Saturday morning:—

Industrial Microbiology (Dr. M. G. Somerville).

The Results of the Bacteriological Examination of Eating Utensils in Restaurants (Mr. M. O. Ekdahl (paper read by Mr. I. W. Saunders).

Advances in Liver Function tests (Mr. J. T. Murray).

After lunch in the Hospital Cafeteria, an inspection was made of the Christchurch Pathology Department, and this was followed by a tour of inspection of the Sewage farm at Bromley under the direction of Mr. E. F. Scott, Assistant Engineer to the Drainage Board.

The papers and a report on the tour will appear as soon as possible in the *Journal*.

On behalf of the Auckland members, Mr. Whillans invited the next Conference to be held in Auckland. This was greeted with acclamation.

TO THE EDITOR

Sir,—

Mr. J. B. Brown in his excellent paper on Biochemical Methods (April 1947) invites discussion of his data. He states that the thiocyanate content of th normal blood is nil. In connection with some recent work on thiocyanate (to be published elsewhere) I studied the literature regarding natural SCN values. Recent American studies using a photoelectric modification of Barker's method (1, 2, 3) suggest that the normal serum SCN concentration gives a range from nil to about 1.5 mgms/100 ccs. Using visual colorimetry I have found lower values than these. Schreiber (4) whose method was used by Barker with minor modifications, found a range of 0.05 to 0.1 mgms/100 ccs. Lang (5) has demonstrated that the ferric salt method is unspecific and that therefore in the low concentration range values may be increased by substances other than SCN. The quantity of these interfering substances is so small in serum that they may be disregarded in the higher SCN value ranges. The more accurate methods of Lang and of Hartner (5) established a range of 0.1 to 0.2 mgms/100 ccs.

It seems therefore that while photoelectric colorimetry with ferric salts gives results somewhat higher than the actual SCN concentration, there is no doubt that the serum does normally contain thiocyanate in small quantities. For practical purposes this is negligible. Theoretically, however, it is of some interest that SCN is a normal constituent of human serum and that it may have some hitherto unknown function in the body. Caviness, et. al. (1) stated that the natural SCN level in blood is lower with patients with essential hypertension than in normals, and that raised blood pressure is simply an expression of SCN deficiency. This assertion has not been confirmed by Trasoff and Schneeberg (2) and Connell, et. al. (3) and may be regarded as incorrect.

ANDOR FISCHMAN.

92 Ranfurly Road,
22/7/47.

Liturature—

(1) Caviness ,et. al. (1941) North Carol. Med. J., 2,585.
(2) Trasoff, A., and Schneeberg, N. G. (1944), Amer. J. Med Sci. 207,63.
(3) Connell, et al. (1946) Amer. J. Med. Sci. 211,74.
(4) Schreiber, H. (1925), Biochem. Z. 163,241.
(5) Hinsberg, K., and Lang, K. (1938), Medizinische Chemie. Vienna.

Printed and published by Douglas Whillans, 139 Kohimarama Road, Kohimarama, Auckland, E.1.