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Vol. 7; No. 3.

OCTOBER, 1952.

JOURNAL OF THE NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

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

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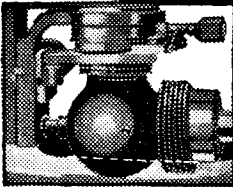
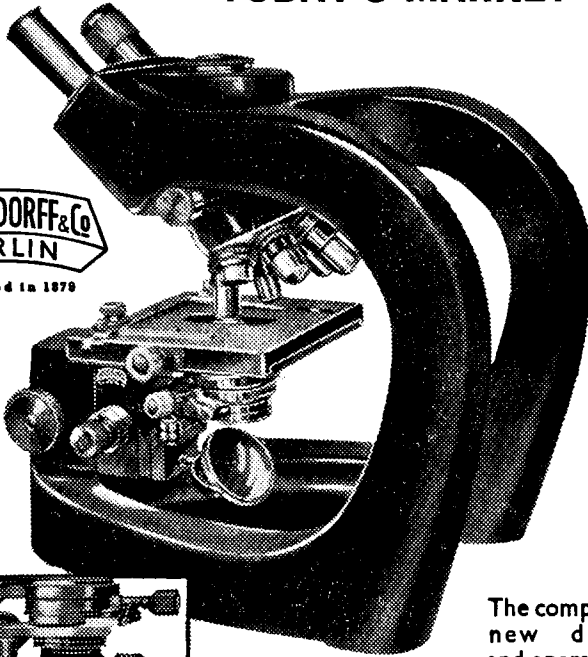
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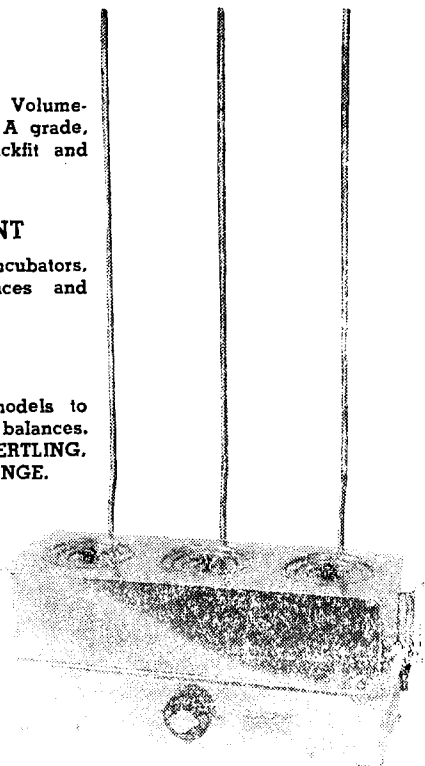
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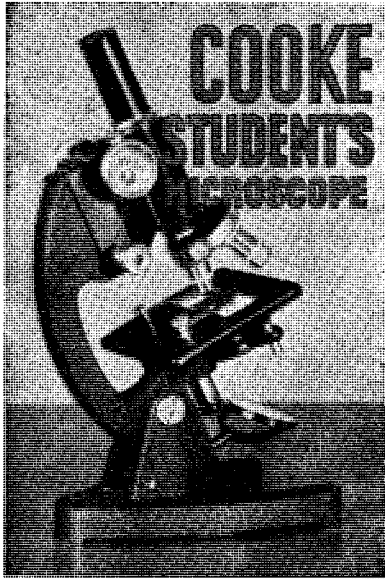
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JOURNAL
of the
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Vol. 7; No. 3.

OCTOBER, 1952.

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LABORATORY DIAGNOSIS OF INFECTIVE
HEPATITIS

I. D. SCOTT

(Bacteriology Department, Thames Hospital)

Introduction:

Infective hepatitis is a virus disease which causes diffuse cellular necrosis of the hepatic cells resulting in hepatic dysfunction and its clinical manifestations. The disease tends to occur in epidemics and as many as 50% of the population may be infected. On the other hand, only sporadic cases may come to notice. Abortive and ambulant cases are common and there is evidence to suggest that healthy carriers may occur. Infection is most probably conveyed by droplets and dust, although one water-borne and one milk-borne epidemic has been reported in literature. The incubation period appears to be about 3-5 weeks, but some authorities claim it can be as much as 90 days. There does not seem to be any real reason to suppose that the agents responsible for "serum" jaundice and "arsenical" jaundice differ from that responsible for Infective Hepatitis even though the incubation period for the two former entities is longer than is commonly the case for the latter.

Clinically, the disease is characterised by sudden onset, with vomiting, fever, malaise and sometimes acute abdominal pain which may so closely simulate that of appendicitis as to cause surgical intervention. This actually happened in one of our cases before the establishment of a laboratory. Jaundice usually, but not always, appears during the first 4-10 days of the disease. The jaundice may be intense, just perceptible or entirely absent and the intensity of the jaundice has some bearing on the general severity of the disease. The liver is almost always enlarged and practically without exception, tender. Indeed, the tenderness over the liver may be the only symptom. Bradycardia is common. The urine is usually dark in colour and oliguria seems to be an early and constant feature. The stools are usually pale or completely "acholic," but sometimes normal.

Multiple cases in a single household occurring at about 4-weekly intervals are common. The case mortality in the primary stages of the disease appears to be about 0.1%, depending to a large extent on the virulence of the infective agent.

After the first stages of acute onset, up to the appearance of jaundice as the 4th-10th day, the disease runs a more or less benign course, the only symptoms evident being some liver tenderness and lassitude sometimes almost to the degree of prostration. Usually, however, the patient feels quite well and is usually impatient to resume activities.

In a small percentage of cases, jaundice reappears during convalescence and even as long as 6 months after the first attack. There is much speculation as to whether this is due to a new attack or remission of the original attack, the virus being dormant in the tissues during this time. There does not appear to be high degree of immunity as patients can suffer from several attacks of the disease over a period of years. There is little difference in literature to the immunological aspect of this condition.

About 0.2% - 1.0% of cases go on to a cirrhotic condition of the liver in time, particularly if convalescence is not complete and patients do not take proper care to recuperate fully before recommencing arduous duties. It is well to remember that whereas the liver damage caused by Infective Hepatitis is reversible, that of cirrhosis is not.

A further, fortunately rare, sequel to this condition is acute yellow atrophy of the liver and also various degrees of acute and subacute hepatic necrosis.

Treatment of the condition does not concern us, but in passing it is of interest to note that adequate bed rest until at least one week after the disappearance of the jaundice, high protein diet supplemented by B-complex vitamins and sometimes plasma infusion are the accepted methods of treatment.

Laboratory Tests of Value in Diagnosis:

As Infective Hepatitis is not a very definite clinical entity as far as symptomatology is concerned, a large part in diagnosis rests upon the various laboratory findings. A resume of the methods used at the Thames Hospital follows. It must be emphasised that owing to staff shortages investigations were kept to a minimum in each case and the tests performed were closely related to the clinical condition of the patient concerned. If difficulty was encountered with the diagnosis additional procedures were carried out with a view to obtaining a more definite indication as to the true state of the patient.

A strict routine of tests was not applied to each case which somewhat invalidates this series of cases from a statistical point of view. However, some interesting facts did emerge and will be dealt with later.

In our experience the examinations most likely to assist in diagnosis but which at the same time, are not specific for Infective Hepatitis are these (1) Blood count consisting of W.B.C. and differential and Hb. (2) Urine examination for Bile and especially Urobilinogen. (3) Various "empirical" liver function tests combined with serum alkaline phosphatase and serum bilirubin estimations. (4) Quantitative estimation for urobilinogen excretion in 24 hour urine, noting especially the 24-hour volume. (5) Quantitative faecal urobilinogen estimation, and (6) Microscopic examination of the urine may also be of value.

We will now consider each of the headings separately and endeavour to present our own findings along with references from literature.

White Cell Count

There are innumerable references in literature to the presence of leukopenia and especially neutropenia in Infective Hepatitis. Most authors agree that neutropenia at least is a fairly constant feature of the disease. A total count of less than 7000 per cmm is said to occur in 60% of cases, but neutropenia is seldom marked. In our series of 37 cases total counts of less than 7000 occurred in 45%, whilst in the remainder the counts ranged from 7000 to 16,000 often with a predominance of polymorphs. In six cases, and then only at the height of jaundice was there a definite neutropenia with an absolute polymorph count of less than 3000 per cmm. Indeed at the time of the first symptoms the leucocyte count was usually raised with a slight to marked polymorph leucocytosis. In view of these findings it is suggested that leucocyte counts at the first presentation of symptoms is of little, if any value for differential diagnosis. At the height of the disease, however, the leucocyte count is usually low and a neutropenia is then present, but by this time the diagnosis is usually established and the leucocyte changes are no longer of interest.

As a large proportion of our cases were admitted with acute abdominal pain and vomiting and the leucocyte count at this time was at the upper limits of or above normal, considerable confusion arose in some cases as to the diagnosis. This was, in part, overcome by using the Ehrlich test for urobilinogen, and demonstrating excess urobilinogen in the urine. There is no anaemia associated with this condition and two or three cases with anaemia were no doubt anaemic before contracting the disease, but this, of course, could not be proved. In one case an iron deficiency anaemia in a patient with a history of inadequate diet was demonstrated. This was no doubt due to the latter cause, not the disease under discussion.

(1) *Random Specimens:*

In about 75% of our cases random specimens of urine were examined routinely. This examination, usually done before the

diagnosis was clear, consisted of microscopic examination, culture if the specimen was catheter or "mid-stream", and chemical examination for protein, reducing substances and acetone, and recording of pH. and S.G. If a history suggestive of Infective Hepatitis was provided, or if the specimen was darkly pigmented, a Schlesinger test for urobilin and an Ehrlich test for urobilinogen was done by the Watson method. Specimens showings values of 1.0 or more Ehrlich units of urobilinogen by this method were tentatively regarded as suggestive of liver damage and a 24-hour urine specimen was requested. Fouchet's test for bilirubin was usually weakly positive, sometimes moderately so.

The only constant and early feature of the urine examination was the raised value for urobilin and urobilinogen. Later in the course of the condition bilirubin appeared in small to moderate amounts and the urobilin and urobilinogen values remained fairly stable. Casts, both granular and hyaline appeared late in the disease in about 60% of cases where the urine was again examined.

(2) *24-hour Specimens:*

These specimens were collected in the wards by the usual routine and were preserved during the collection period by refrigeration only. On examination in the laboratory the volume was measured and noted. In every case where 24-hour urine was collected and the condition was clinically and biochemically shown to be Infective Hepatitis later, there was marked to slight oliguria. The urinary volumes ranged from 485 to 1150 mls, the lower limit of normal being taken as 1200 mls for a patient on a normal fluid intake. This phenomenon of oliguria appears to be quite constant and is probably a significant finding. The total urobilinogen excretion was calculated after estimation of the urobilinogen by Watson's method after thorough mixing of the specimen. The 24-hour urobilinogen excretion of the patients so tested was found to range from 6.7 Ehrlich units to 24.15 Ehrlich units per 24 hours. The normal values were taken as 1.0 to 5.0 Ehrlich units per 24 hours. In eight patients suspected of having Infective Hepatitis but subsequently shown to have some other condition the urinary volumes ranged from 1105-2010 mls and the urobilinogen excretion from 1.02 to 5.3 Ehrlich units per 24 hours.

A further finding, the significance of which is not known, was the production of an orange-yellow colour in the final solution of the Watson urobilinogen method. Those who are familiar with this method will know that the colour produced by the reagents is violet, varying in intensity with the concentration of urobilinogen. The orange colour produced was similar to that produced with Ehrlich's reagent by sulphonamides, but as none of these patients were receiving therapy of any kind at the time of the test the colour must have been due to some metabolite excreted

in the urine. As a spectrophotometer was not available, the absorption spectrum of the final solution could not be determined. The tests were read with a filter having maximum absorption at 5700° (yellow-green) so that most of the interfering orange-yellow colour would thus be eliminated. No attempt was made to identify or isolate the substance responsible.

Blood Biochemistry

A considerable battery of liver function tests selected to cover all reasonable contingencies expected to be found in disease of the liver were performed on all patients admitted with jaundice regardless of age and clinical symptoms. The series of tests performed in each case were as follows:—(1) Thymol turbidity (Maclagan); (2) Thymol flocculation (Neefe); (3) Takata Ara (Ucko modification); (4) Colloidal gold (Maclagan); (5) Serum Alkaline Phosphatase (Armstrong & King); (6) Serum bilirubin (Haselwood). Details of the reagents required and the methods for these tests may be found in appropriate biochemical text books so will not be detailed here. Total serum protein and serum albumin were determined by the usual micro-Kjeldahl methods. The latter after partition of the globulin with 22.2% Sodium sulphate and ether.

From the above series of tests a conclusion can be drawn that there is no characteristic pattern of findings by which a dogmatic statement can be made as to whether a particular patient has or has not Infective Hepatitis. Over the whole series of tests 62 or 22% gave the complete reaction as compared with 71 or 25.8% which gave negative values. The greatest majority of the strongly positive results were obtained during the second to fourth week of the disease, whereas the negative values were obtained mostly in convalescent patients. 87% of the patients at one time of their illness showed complete reactions to at least two of the tests and the remaining 13% showed at least moderate positives to some of the tests. No patients with clinical Infective Hepatitis had a completely negative series.

Of the four empirical tests cited the colloidal gold test seems to be the most sensitive of all and the modification of the Takata Ara used the least. The colloidal gold became positive early in the disease and was the last test to give negative results on convalescence. Of the 69 colloidal gold tests done, 57 or 83% were positive to two plus or more whilst only 20 or 29% of the Takata Ara had two or three plus reactions. The sensitivity of the thymol flocculation exceeds that of the Thymol Turbidity if the results of the latter are arbitrarily graded according to the degree of the turbidity as in the table above.

A criticism of these turbidity and precipitation tests is that the grading and reading of results is largely a matter of personal opinion, although some of the methods readily lend themselves to

reading with a nephelometer or photo-electric colorimeter, thus standardising the readings. An arbitrary grading system can then be applied which results in some standardization of the values obtained.

Serum Bilirubin

The method employed is the diazotization method of Haselwood for the estimation of total serum bilirubin in serum. The Van den Berg reaction was neglected. Of the 69 series of tests 27 or 39.7% of the serum bilirubin levels fell within normal limits (0.2 - 0.8 mgms %), 25 or 36.7% fell between 0.8 and 2.0 mgms%, 19 or 15.9% between 2.0 and 5.0 mgms%, 4 or 5.8% between 5.0 and 10.0 mgms% and 2 or 2.9% between 10.0 mgms % and 15.5 mgms %, which was the highest value encountered.

The majority of the normal bilirubin values were obtained from patients either very early in the condition or during convalescence. During the jaundiced period the bilirubin rarely rose above 5 mgms.%, and was in 52.6% of the patients between the upper limit of normal and 5.0 mgms.%. In the two cases where the bilirubin rose above 10 mgms.% the patients were both severely ill clinically and were assumed to have sub-acute hepatic necrosis as an aftermath of the Infective Hepatitis which both had had earlier, and from which they had apparently convalesced, only to be admitted later with severe jaundice and in a critical condition. In two cases, the serum bilirubin was normal throughout the disease, although the empirical liver function tests were positive. These cases were no doubt mild examples of the condition, and at no time could these patients be considered acutely ill.

Serum Alkaline Phosphatase

References from literature usually state that the value for serum Alkaline Phosphatase is almost always below 30 Armstrong-King units /100 mls. serum. In four of our cases the value at one time exceeded 40 units, and in two was 66 and 62 units respectively. In the former patient the serum bilirubin was 3.8 mgms. % and in the latter 15.5 mgms. %.

Of the whole series of 69 tests, 47 (67.5%) Alkaline Phosphatase estimations fell between the normal limits of 4—15 A-K units. 18 or 26.1% between 15 and 30 units and 4 or 6.4% over 30 units. There is therefore the more or less constant finding in that 93.6% of the patients with Infective Hepatitis have alkaline phosphatase levels below 30 K-A units and even with a severe degree of bilirubinaemia the phosphatase level does not reach the high values expected in obstructive type jaundice with comparable bilirubin values.

Serum Proteins

Total serum proteins for the great majority of cases fell

estimations performed 45 (75%) were within this range, whilst the remaining 25% were above 8.0 gms.% (highest 9.4%).

Similarly, the serum albumin was usually within the normal limits of 3.0-5.5 gms.%. In 4 instances (6.6%), the value was below 3.0 gms., and in only one instance was the upper limit reached.

On the other hand the serum globulin was usually increased, sometimes markedly and the A-G ratio was thus lowered (normal figures 1.0 - 3.05). In 39 cases (65%) the globulin value exceeded the upper limits of normal (3.0 gms.%) and was within the normal limits of 1.8 - 3.0 gms.% in 21 cases or 35%. In no case was the value below the lower limit of normal. The highest value obtained was 6.3 gms. The A-G ratio was normal in 73.7% of the cases and below 1.0 in 17 cases (26.3%). The average A-G ratio over the whole series was 1.32 as compared with the mean average normal of 2.07 ± 0.43 .

Other Examinations

Faecal Urobilinogen.

This examination was done in four cases, all of which resulted in values at or slightly above the lower limits of normal (130-250 mgms.%). The stools in all cases were pale, but not clay coloured and the estimation was made by the method of Watson after ferrous sulphate treatment of the stools.

Blood Urea.

The blood urea was estimated in one case with severe jaundice and a value of 71 mgms.% was obtained. The patient was critically ill at the time and there was evidence to suggest renal damage as large numbers of casts and R.B.C.'s were found in the urine.

Tests Not Attempted

Liver function tests such as Bromosulphalein retention, galactose tolerance, cholesterol esters, cephalin-cholesterol flocculation or hippuric acid tests were not attempted, principally because it was felt that the series of tests previously described adequately covered our requirements and secondly because reagents for some of these ancillary tests were not available to us at the time.

Interpretation of Results

History: It is essential to obtain the patients complete clinical history including age and sex. Females under 40 years appear to contract the disease more often than males under 40, and cases in both sexes aged over 40 appear to be relatively uncommon. In our series 62.1% of the cases were females and 37.9% males. Of the total number, 34 were under 40 and 3 over this age. Although this is a small series of cases these figures are probably significant. The average age of all patients was 23.55 years. At

least one and often several of the clinical symptoms mentioned in the introduction to this paper were present in all patients, the most characteristic being tenderness over the liver, with or without hepatic enlargement.

At the presentation of symptoms it was frequently found that the laboratory tests were all negative, but this in itself is suggestive of the condition under discussion as the liver changes responsible for the changes in the laboratory results do not occur at the onset of the disease in a sufficiently severe degree to give positive findings. Where urobilinogen excretion was estimated this test was often positive where the other tests were negative and is considered to be the most sensitive index of the nature of the disease in its early stages. The Colloidal Gold and Thymol Turbidity become positive next in that order, and the Takata Ara is the last change to take place, if, indeed a positive reaction is present at all. A positive Takata Ara would therefore suggest a more severe infection than is usually the case. Serum protein changes appear at about the same time as the Thymol Turbidity becomes positive and frequently remain disturbed for a long period, often showing progressive decline of the A-G ratio even after the patient has been convalescing for some weeks. If the maximum reactions in all tests are found the condition may be considered serious and several serial tests should be done at about monthly intervals for progress.

We considered the diagnosis to be established in patients who showed the following histories and laboratory findings and who were in the age group below 40 years.

- (1) Generalised malaise and/or liver tenderness.
- (2) Jaundice either slight or marked.
- (3) Slight to marked temperature and "off-colour" of several days.
- (4) Abdominal pain and/or nausea.
- (5) Oliguria.

Histories of this sort usually lead to the suspicion of Infectious Hepatitis, especially if the history was fairly "vague" from the patient. This was especially so after some experience with the condition had been obtained.

Liver function tests were usually requested, and if negative or doubtful positive findings were obtained, the 24-hour urinary urobilinogen excretion was asked for by the Laboratory. This examination was frequently positive and the patient very often obligingly became jaundiced a few days later when it was nearly always found that the Liver Function tests had become positive and suggestive of Infective Hepatitis. The criteria for a positive liver function test in Infective Hepatitis were taken as:

Thymol Turbidity over 5 units.
Thymol Flocculation 2 plus and over
Takata Ara: Negative to 2 plus.
Colloidal Gold 2 - 5 plus.
Alkaline phosphatase under 30 units.
Serum bilirubin—normal or raised.
Total serum proteins } Normal.
Serum albumin }
Serum globulin near or over 3.0%.

It is essential, however, to interpret the results of tests with extreme caution, at the best they can only be of a confirmatory nature in establishing a suspected diagnosis. Sometimes this series of tests may help the physician to diagnose a condition which is not always easy to diagnose at first. The leucocyte count is probably the best means of distinguishing the disease from Infectious Mononucleosis, which can be easily confused with this condition in certain stages of its course.

Once more, I must emphasise, in conclusion that the picture must be viewed as a whole and reliance must not be placed on one test or series of tests without considering all the evidence in the proper perspective. The final diagnosis always rests with the physician, but the Laboratory can confirm or repudiate the suspected diagnosis in the great majority of instances, sometimes in the early stages when the correct diagnosis is of the utmost importance.

Acknowledgments are due to Dr. K. Archer, Medical Superintendent of the Thames Public Hospital for permission to read this paper, and to Dr. Grace Hackett, Senior Medical Officer of the same hospital for her helpful criticism and valuable suggestions during its preparation.

DEPARTMENT OF HEALTH

Final Qualification for Hospital Bacteriologists for Certificate of Proficiency in Hospital Laboratory Practice.

**Examiners: Dr. Pullar, Dr. Reid and Dr. Smith.
Department of Pathology, Wellington,
September 3rd-5th, 1952.**

**Written Paper, Wednesday, Sept. 3rd, 1952,
9.30 a.m. - 12.30 p.m.**

1. Describe the technique of the red-cell fragility test.
How is this test made quantitative?
What conditions cause alteration of the osmotic fragility of the red cells?
2. Discuss the interpretation of agglutination reactions obtained in suspected cases of typhoid or paratyphoid infection, and in "carriers" of these organisms.
Describe briefly the other laboratory tests used in the diagnosis of enteric fever.
3. Explain briefly the meaning of the following terms:—
 - (a) Molar solution.
 - (b) Numerical aperture.
 - (c) Caramelisation.
 - (d) Beer's Law.
 - (e) Megaloblast.
4. Give an account of the methods available in hospital laboratories for the estimation of the serum proteins, and discuss any difficulties associated with fractionation of serum into "albumin" and "globulin."
5. Tabulate the various steps in the preparation of a tissue section, by paraffin embedding, from the fresh specimen to the finished slide (haematoxylin and eosin) giving the period of time for each step.

PRACTICAL EXAMINATION

1st part, Wednesday, 3rd Sept., 1952, 2-5 p.m.

Section A—Bacteriology

1. You are provided with penicillin, a sterile solution of penicillinase (Tube A) and a pure culture of *Staphylococcus aureus* (Tube B) var. Oxford H.

Determine the activity of the penicillinase in units per c.c. given that 1 unit of penicillinase will inactivate 50 Oxford units of penicillin in one hour at 37°C.

2. You are provided with a pure culture of a non-lactose fermenting coliform bacillus. Identify the organism. (Please mark clearly on your paper the number on the culture tube given.)

(*S. typhi*, *Sh. flexner*, *Sh. sonnei*.)

Questions 1 and 2 are to be completed on Thursday afternoon.

All steps to be tabulated clearly and concisely.

3. Examine each of the six cultures provided and indicate to which group the organisms belong.
Record briefly what further steps would be necessary for complete identification.

(1. *Cl. tetanomorphus*. 2. *B. anthrax*, 3. *Streptococcus faecalis*. 4. *Leptothrix*. 5. *C. diphtheriae*. 6. *Pasturella*).

Section B—General

1. Stain by Gram the paraffin section marked "X", tabulating the method.
2. Stain by Ziehl-Neelsen the paraffin section marked "O", tabulating the method.
3. (a) Examine and report on slide "A" (Pleural fluid. Scolices of *E. granulosis*).
(b) Examine the specimen of faeces provided for qualitative evidence of excess split or unsplit fat.
Record steps taken and state your conclusions.
4. Examine the urine provided for evidence of disordered bile metabolism.
Tabulate the tests used and state briefly their significance.

PRACTICAL EXAMINATION

2nd part, Thursday, 4th Sept., 1952, 9.30 a.m. - 12.30 p.m.

Section A—Biochemistry.

1. Carry out a full chemical examination of the gastric test meal provided.
2. Estimate the total non-protein nitrogen in the specimen of blood provided.
State briefly the rationale of the steps involved and set down clearly the calculations done.
3. Calculate the weight in grams of the specimen of oxalic acid supplied in flask using the standard alkali provided for gastric analysis.

Oxalic acid $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$. C = 12, O = 16
Na = 23, H = 1,

Section B—Haematology

1. Determine the suitability of the serum provided for use in ordinary ABO blood grouping.
 - (a) State the lowest level of titre which you would use.
2. Perform a reticulocyte count on the specimen of blood provided.

State briefly:—

- (a) The nature of the reticulocyte.
 - (b) The significance of a 4% reticulocyte level at a RBC of 1,000,000 and a 4% reticulocyte level at a RBC of 5,000,000.
3. Stain where necessary, examine and report on the blood smears provided.

A differential count is required on slides 1 and 3 only.

 1. Myeloid leukaemia. 2. Pernicious anaemia.
 3. Myeloid leukaemia?—60% monocytes.
 4. Erythroblastosis foetalis. 5. Malaria.

ORALS

Some of the questions asked were:—

Dr. Pullar:

The preservation of complement, Wassermann reaction, Widal titres after T.A.B. inoculation, Beer's law, Spectrophotometers and Haemoglobinometers and their differences, diffraction grating, microtomes, C.S.F. findings, blood sugar methods, uric acid, acid and alkaline phosphatases and units with reference to Bodansky, Gregersen's test, albumin in urine, Bence-Jones protein, blood chlorided and levels, blood calcium, stain for connective tissue iron, and elastic fibres, dioxane, Rh and preparation of Coomb's reagent and preparation of material.

Dr. Reid:

Grades and engravings on volumetric pipettes and measuring cylinders, the concentration of penicillinase in broth for blood cultures, Coomb's test, routine cross types, quick method for D typing, use of papain and bovine albumin, Du and Cu antigens and tests for Du, anti A₁ and A₂ sera for typing, investigations after incompatible blood transfusions, actinomycetes, pH and pH meters, CO₂ combining power, the significance of raised neutral and split fats in faeces, nocturnal haemoglobinuria and Ham's test, megaloblasts, is a megaloblastic marrow diagnostic of Pernicious Anaemia, macrocytes and conditions in which found, sickle cell anaemia, spherocytes, target cells and Cooley's anaemia, infectious mononucleosis and use of ox cells, estimation of potassium, Schum's test.

Dr. Smith :

Sending of specimens from small laboratories, equipment for small laboratory, instructions you would give to orderlies who undertake sterilising, animal inoculations, millequivalents, dibasic salts, principles and advantages of steam sterilisation, sterilisation of rubber gloves, talcum, syringes, rubber corks, preparation of broth, tellurite media, Robertson's cooked meat medium, carbol fuchsin, types of methylene blue, intravenous solutions, how long blood diluents should be kept (for transfusion), pyrogens, sterility of catgut, disposal of infected material by antiseptics.

MINUTES OF A MEETING OF THE COUNCIL N.Z.A.B.
HELD AT HAMILTON, 7.30 p.m., 6th AUGUST, 1952, IN
THE PRIVATE LOUNGE OF THE COMMERCIAL
HOTEL

PRESENT: Messrs. D. Whillans, Adamson, Buxton, Murray, Olive and McKinley.

APOLOGIES: Messrs. Samuel, Saunders, Jarratt.

The Conference Secretary, Mr. Keenan, attended by invitation.

The minutes of the Council Meeting of 22nd March, 1952, were confirmed. (Buxton—Adamson.)

The Council extended congratulations to Mr. Jarratt on the occasion of the arrival of another son, and also expressed appreciation of his services as a Council Member. Mr. Jarratt did not seek re-election.

The Council also expressed appreciation of the services of Mr. Saunders, retiring Vice-President, who did not seek re-election.

The Hon. Secretary was instructed to write suitable letters to Messrs. Jarratt and Saunders. (Olive—Buxton.)

The Council instructed the Hon. Secretary to write to Miss Partridge, Mr. Schwass and Mr. Saunders, expressing the wish that they would soon be restored to health and inform them that in accordance with the past policy of the Council they are financial members for the year 1952-53. (Olive—Murray.)

NEW MEMBERS: Mr. V. C. Jones, Auckland; Miss C. Hall, Auckland; Mr. H. Little, Auckland; Miss M. K. Thompson, Auckland; Miss M. Kennedy, Thames; Sister M. Killian (Mater Hospital), Auckland; Miss U. N. Curtain, Nelson; Miss D. Hitchcock, Nelson; Miss A. Jagger, Nelson; Miss N. McLachlan, Nelson; Mr. J. A. Walker, Greymouth; Miss J. A. Mills, Rotorua; Miss Joan Yates, Wellington; Miss M. Bell, Wellington; Miss B. Edwards, Wellington; Miss M. Eales, Christchurch; Miss J. Brown, Christchurch; Miss J. Johnston, Hamilton; Miss Jean Cros, Invercargill; Mr. G. B. Winders, Invercargill; Mr. R. W. Smail, Invercargill; Miss S. Jury, Tauranga; Mr. B. McLean, Napier; Miss J. Hellyer, Napier; Miss M. Parkhill, Hastings; Miss K. Ryan, Palmerston North; Mr. W. A. Stuckey, Blenheim; Mr. A. J. Petrie, Blenheim; Miss L. Mackay, Oamaru; Mr. D. Hogan, Massey College, Palmerston North. (Buxton—Olive.)

The following resignation was accepted with regret:—Mr. R. L. Bennett, Christchurch, who is leaving Hospital Laboratory work. (Murray—Buxton.)

INWARD CORRESPONDENCE was received. (Olive—Buxton.)

OUTWARD CORRESPONDENCE was confirmed. (Olive—Murray.)

A letter from the Hon. Secretary to Mr. Hawke, Nelson, regarding trainees in his laboratory and the question of the pre-requisites held by these trainees, was approved by the Council. (Olive—Murray.)

The next Intermediate Examination will be held in October, 1952, at Auckland.

The Association's nominee for the position of examiner is Mr. Jarratt, Palmerston North. (Whillans—Buxton.)

The Council expressed appreciation of the work of the Conference Secretary, Mr. Keenan, of Hamilton. (Olive—Adamson.)

The Council confirmed the action of the members of the Salaries Advisory Committee in preparing submissions for the August meeting of the Committee. (Adamson—Murray.)

The Hon. Secretary reported on his meeting with the Conference of Pathologists and representatives of the Department of Health, at Dunedin, May, 1952.

He considered that the most satisfactory method of consultation with the Pathological Society would be for representatives of the Department of Health, the Society and our Association to meet, rather than to continue to send a deputation to the Conference of Pathologists.

The Council agreed with this view, and it was decided to seek the opinion of Conference on this matter.

The Hon. Secretary was instructed to write to the I.M.L.T., England, concerning the question of reciprocity, and seek details regarding their Syllabus for examinations. Council Members were of the general opinion that the English Fellowship compared favourably with the New Zealand qualifying examination, this opinion being based on the latest information members had received regarding the English Syllabus, etc.

HONORARY MEMBERS: The Council decided that this list of Honorary Members of the Association was overdue for revision, and it was left to the incoming executive to attend to this matter.—(Buxton—Murray.)

BALANCE SHEET: The Hon. Treasurer tabled the Balance Sheet to be presented to Conference, 1952, and explained various points to Council Members.

ACCOUNTS PASSED FOR PAYMENT: Travelling expenses of Council Meeting 22/3/52, were approved.

April, 1952, "Journal"	£48 18 6
Journal Expenses and Conference Printing	£10 2 7
Secretarial Expenses (1951-52)	£8 16 5

—(Buxton—Murray).

The Hon. Treasurer reviewed the financial position of the Association, and it was decided that it be a recommendation from Council to Conference, 1952, that subscriptions be increased as from April 1st, 1953, and that a levy be struck for the year 1952-3.—(Buxton—Adamson.)

The meeting closed at 1.15 a.m.

THE NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

EIGHTH ANNUAL CONFERENCE, 1952, WAIKATO HOSPITAL, 7th and 8th AUGUST.

The President, Mr. D. Whillans, Auckland, said that it was his proud privilege to occupy the chair at the Eighth Annual Conference of the New Zealand Association of Bacteriologists, the first to be held in the Waikato—not that we had been reluctant to come to Hamilton, but the calls of the larger centres had been heeded in our earlier Conferences, and the convenience of the greater number of those travelling to Conference had been considered.

However, we were meeting this year in Hamilton, in perfect weather, and he considered it an honour that we were to be addressed by the most important man in the town, the Mayor, Mr. Caro.

"From our point of view, it is even more important that he is also Chairman of the Waikato Hospital Board," said Mr. Whillans, who then called on Mr. Caro to address the delegates.

Mr. Caro said he welcomed delegates in a dual role, as Mayor of the City, and as Chairman of the Waikato Hospital Board.

As Mayor he welcomed us to the "Garden City" and said Hamilton was proud to have Conferences held here, in beautiful weather which he assured us was typical of Hamilton's good climate, despite talk of such things as fog.

He trusted we would be sure to see three things during our stay in Hamilton—the city, the Waikato River and the Ranfurly Shield.

He considered Conferences were especially necessary in our work—not all Conferences could be so classed, but he did consider that ours was one which must be held yearly.

As Chairman of the Waikato Hospital Board, Mr. Caro stated that the Board's Hospitals were doing jobs second to none. The Board had the largest area in New Zealand to control, and embraced an area from Te Aroha to Raglan, from Huntly to Te Kuiti, and included Taupo and Rotorua. It was a huge concern, and he was proud that Hamilton was to be designated a base hospital. Mr. Caro said that numerous improvements were going on, buildings were being erected throughout the Board's area, and he gave as instances the new Nurses' Home, Operating Theatre, and Offices at Hamilton, 80 new beds at Rotorua, a new hospital at Otorohanga, renovations at Te Kuiti, also at Taupo, and new hospitals at Raglan, Te Awamutu and Putaruru.

The Waikato is progressing rapidly, with a population of 165,000, and overcrowding is present at the moment.

Mr. Caro said that Bacteriology was a "new" science and had made great strides since the days of the great names of Virchow, Pasteur, Jenner and Koch. It was a profession that had saved lives and would continue to expand to further help in the fight against disease.

Mr. Caro then expressed the hope that delegates would enjoy their stay in Hamilton.

The President thanked Mr. Caro for his cordial welcome, and said he was sure we would all enjoy our visit.

The President then introduced Dr. Gould, Medical Superintendent, Waikato Hospital, saying that there is one man in every hospital whose duty it is to interpret the wishes of the Board to the Staff and patients, and also the needs of the Staff and patients to the Board. That man, the Medical Superintendent, carries the cares of the hospital on his shoulders, and Conference was honoured that Dr. Gould had consented to open Conference, 1952.

Dr. Gould said he was pleased to see delegates from all parts of New Zealand assembled in Hamilton, and he hoped we had a very successful Conference. Conferences were very useful indeed as they enabled free exchange of ideas to take place, and he was glad the Department of Health had approved such scientific gatherings as ours. Dr. Gould referred in general to the growth of Waikato Hospital, which had more than doubled its bed-state in 12 years, and in particular to the Pathology Department, where there were a keen lot of workers, and a new Laboratory was a real necessity.

Dr. Gould then declared Conference 1952 open.

The President thanked Dr. Gould for attending and called on Dr. Somerville, Pathologist, Waikato Hospital, to address delegates.

Dr. Somerville said that his definition of "Conference" was "to talk with," and he proposed to talk with us about our Laboratory services. After welcoming us to Waikato, Dr. Somerville said that a Conference was called for one or both of two reasons, executive business and *talk*, or scientific papers and *discussion*. Ours was of the latter type, and he hoped it would never become a "talking" Conference.

Informal discussion following papers, the comparing of notes and methods—these were of great importance at any Conference. Dr. Somerville said he enjoyed the Conferences of the Pathological Society, and welcomed the opportunity of seeing the way things were done in other hospitals; accordingly, he extended an invitation to delegates to visit his Department while in Hamilton.

Dr. Somerville said the Association had made great progress in the seven years it had existed, and was now a body of scientific people, firmly welded together. He referred to the improved salary scales, which he

thought were reasonable, and he welcomed the idea of a Grading Committee, as it gave people an incentive to work.

In conclusion, Dr. Somerville mentioned that the Higher Examination had been referred back to us for further consideration, and he urged us to bear in mind that the more scientific papers we could include in our Conference the better; he wished the Association well, and hoped we would have a happy and profitable Conference.

The President thanked Dr. Somerville for his address, and referred to the happy relations the Association had enjoyed with the Pathological Society, resulting in much progress over the last seven years.

Morning Tea.

Roll Call—Delegates to Conference, 1952: Mr. Whillans, Auckland; Mr. Olive, Wellington; Mr. McKinley, Waipukurau; Mr. Murray, Christchurch; Mr. Buxton, Wanganui; Mr. Adamson, Christchurch; Mrs. Taylor, Christchurch; Mr. Don, Christchurch; Miss Mattingley, Wellington; Mr. Smith, Waikato; Mr. Keenan, Waikato; Mr. Clapson, Waikato; Mr. Mann, Waikato; Mr. Harper, Waikato; Mr. Barry, Waikato; Miss Davies, Waikato; Miss Hamilton, Waikato; Miss Johnstone, Waikato; Mr. Ward, Timaru; Mr. Josland, Wallaceville; Mr. Reeve, Palmerston North; Mr. Philip, Auckland; Mr. I. Cole, Auckland; Mr. Sloan, Auckland; Mr. Curtis, Auckland; Mr. Rush-Munro, Auckland; Mr. Meads, New Plymouth; Miss Brown, New Plymouth; Mr. Walsh, Auckland; Miss Byres, Auckland; Sister Killian, Auckland; Sister Mary Paula, Auckland; Miss Scott, Auckland; Miss Dick, Auckland; Miss Sayers, Auckland; Mrs. Strickland, Auckland; Miss Saxby, Napier; Mr. Diggie, Westport; Miss Corsbie, Tauranga; Miss Jury, Tauranga; Mr. Rankin, Napier; Mr. Bloore, Blenheim; Mr. Eldahl, Gisborne; Mr. George, Rotorua; Mr. Ronald, Whangarei; Mr. Carruthers, Rotorua; Mr. Harper, Wanganui; Mr. Scott, Thames; Mr. Jenner, Hawera; Mrs. Jenner, Hawera.

Apologies: Messrs. Ellison, Samuel, Peddie, Murphy, Pierard, Bell, J. Cole, K. Bilkey, Till, Holt, Masters, Jarratt, Mrs. Isabeth, Miss Wooley, Connolly.

Received: (Buxton—Murray).

PRESIDENT'S ADDRESS

The President, in opening his remarks, paid tribute to the Presidents who had preceded him and was sorry that the immediate Past President, Mr. Ellison, was unable to be present owing to pressure of work.

He felt that almost all of the problems which had confronted members at the first Conference had been solved and remarked that this was a challenge—that members must not face the future with apathy. Much still remained to be done and there was much consolidation required on the ground gained.

There were still some unsettled points, the most important, of course, being the question of the action against a certain Union, the Higher Examination and the question of examiners in the Final Qualifying Examination.

He appealed to the members to support the Journal and in concluding, appealed to members to expedite the business of the meeting so that the scientific part of the programme would not be cramped.

Minutes of Conference, 1951.

As these were published in the "Journal," they were taken as read. That the minutes be confirmed. (Olive—Murray.)

The Annual Report.

The Annual Report was presented by the Hon. Secretary, and was adopted. (McKinley—Curtiss.)

The Balance Sheet.

The Balance Sheet was presented by the Hon. Treasurer, and was received. (Olive—Buxton.)

Mr. Smith congratulated the Executive on the year's work, and said

he was sure he spoke for all members in stating that a great deal had been accomplished by the Association.

A vote of thanks to the Hon. Secretary and Hon. Treasurer for their work in connection with the Annual Report and Balance Sheet was carried. (Bloore—Miss Corsbie.)

Election of Officers, 1952-53 (Postal Voting).

President: D. Whillans, Auckland.

Vice-Presidents: E. Buxton, Wanganui; D. Adamson, Christchurch.

Hon. Secretary: G. McKinlay, Waipukurau.

Hon. Treasurer: H. Olive, Wellington.

Members of Council: A. Samuel, Dunedin; L. Reynolds, Wellington, F. Rush-Munro, Auckland; Miss P. Scott, Auckland.

Moved: That the Hon. Secretary destroy the voting papers. (Olive—Cole.)

The *President* welcomed the new members of the Executive, Miss Scott and Messrs. Reynolds and Rush-Munro.

A vote of thanks to the 1951-52 Council and retiring members was carried. (Ronald—Bloore.)

Finance.

The Association found that it needed more finance, and accordingly the Subscriptions were fixed for the year commencing 1st April, 1953, at Senior, £1/10/-; Junior, 15/-. Carried unanimously. (Olive—Adamson.)

In addition, a levy was struck for the current year, Grade Officers £1, Staff Bacteriologists 10/-, Junior Members 5/-. Carried unanimously. (Cole—Rush-Munro.)

Mr. Murray said it was obvious that the Association must balance its budget, and build up reserve funds, and he appealed to Senior members of the profession to give more than the actual levy.

The *Hon. Secretary* gave a review of the year's activities, including the meeting with the representatives of the Department of Health and the Pathological Society; decisions from this meeting are awaited.

The Hon. Secretary also informed members of the present state of the Association's action v. an Industrial Union. The Union's appeal was successful, and in effect the position is now that which obtained in September, 1949, when the proceedings were first instituted.

Luncheon Adjournment—12.30 p.m.

Conference Resumed 2 p.m.

There was a general discussion on the Union position and members were unanimous that the Council should keep a careful watch on the position and protect the interests of Association members. (Olive—Corsbie.)

The members of the Salaries Advisory Committee were recommended to consult with the Hospital Boards' Association, and the Department of Health regarding any future moves in the Union situation.

Moved: "That this Annual Conference of Hospital Bacteriologists reaffirms its support of the Council in its fight to prevent N.Z. Hospital Bacteriologists being included in any Industrial Union."—Carried unanimously. (Ronald—Miss Scott.)

Honoraria: The Hon. Secretary, £3/3/-. The Hon. Treasurer, £3/3/- (Josland—Bloore). The Hon. Auditor, £2/2/-. (Olive—Miss Mattingley.)

Mr. Josland mentioned that in Government Departments the Certificate of Proficiency was not recognised as a professional qualification.

Moved: "That it be a recommendation to Council that the Public Service Commissioner be approached with a view to having the Certificate of Proficiency in Hospital Laboratory Practice recognised by the Public Service as a professional qualification." (Josland—Ronald.)

Letter from Mr. Pery-Johnson. This letter, giving details of the salary scale, etc., for positions in the medical Department, Suva, Fiji, was read to delegates.

Conference, 1953: Christchurch.—(Murray—Adamson.)

Mr. Buxton said he hoped that Conference 1954, which would be held

in the North Island, would be in Wanganui.

Uniforms: Miss Corsbie introduced the subject of uniforms for Laboratory workers, and wondered if a standard uniform could be introduced. Delegates were of the general opinion that this is a matter which is best dealt with in individual Laboratories, and apart from protective clothing for special purposes, is not the concern of the Association.

The Journal: A vote of thanks to the Editorial Committee was carried. (Buxton—Olive.)

Mr. Cole asked for more papers for the "Journal." If members did not receive their "Journal," write to the Editor immediately.

The President spoke of the cost of the "Journal." Costs were increasing steadily, but it was essential to keep the "Journal" going. He mentioned that complete sets of the "Journal" were available on application to the Editor.

Conference Committee: A vote of thanks was proposed, and carried with acclamation, to the Hamilton members who had worked so hard to ensure the success of Conference, 1952. (Whillans—McKinley.)

Mr. Smith, in reply, said that it had been a great pleasure to the Hamilton members to do what they could to enable the Conference to be held in the Waikato, and he paid especial tribute to the Conference Secretary, Mr. Keenan, who had borne the main burden of the work.

The President thanked delegates for their co-operation, and said that it was gratifying to conclude the business so promptly.

Conference closed at 4.15 p.m. with a vote of thanks to the Chair. (Murray—Olive.)

Papers were presented as detailed in the official Conference Programme, and all were well received.

Two films were also shown.

The visit to Ruakura was very successful, and delegates were most interested in all that they saw there.

In the evening, second day, a social function was held, and as in previous years, was an outstanding success, allowing members time for that informal discussion which can be a most valuable part of any Conference.

The papers presented at this Conference were as follow:—

Marrow Punctures: Dr. G. E. Fairbrother; *The Laboratory Diagnosis of Infective Hepatitis,* I. D. Scott (a summary appears in this issue); *Blood Groups in Relation to Ethnology,* Miss P. B. Scott (a summary appears in this issue); *The Recording of Laboratory Tests,* D. Whillans; *Recent Methods for the Estimation of Serum Protein Fractions,* A. Fishman.

The latter paper which was given on Thursday evening provoked much interesting and informative discussion which was followed by an informal discussion on the training of Bacteriologists.

CHIEF LABORATORY ASSISTANT

MEDICAL DEPARTMENT — FIJI

The post of Chief Laboratory Assistant, Medical Department, Fiji, is vacant. The salary attached to the post is in the scale £575 X25 - £600 X30—£750, plus Cost of Living Allowance at 10% of salary. The duties will include supervision of the subordinate staff in routine laboratory work and assistance in the teaching of Pacific Island Students at the Laboratory and Central Medical School. The duties will be under the direction of the pathologist. In other respects, the usual conditions of service will apply.

Intending applicants should obtain forms from the N.Z. Agents for the Colony of Fiji, Messrs. L. D. NATHAN & CO. LTD., Box 190, Auckland, and should address their applications to the DIRECTOR OF MEDICAL SERVICES, Suva.

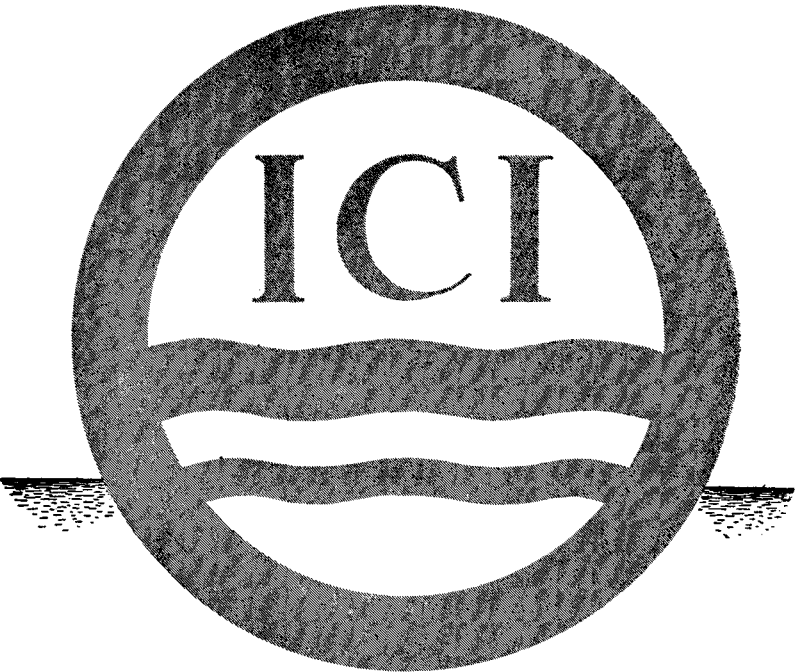
NOTICE OF LEVY

At the Conference, 1952, it was unanimously agreed that as the finance of the Association were at a low ebb on account of the payment of our share of a Court action against a certain Union, a general levy would be made. It was agreed that this should be as follows:—

Grade Officers	£1
Senior Members	10/-
Junior Members	5/-

It would assist the Treasurer, Mr. H. T. G. Olive, immensely if this levy could be paid to him immediately, so that necessary funds for the proper carrying on of the Association can be obtained without delay.

G. W. McKINLEY,
Hon. Secretary.



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