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JOURNAL OF THE NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

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JOURNAL
of the
NEW ZEALAND ASSOCIATION OF BACTERIOLOGISTS

Vol. 8, No. 2 July, 1953

A STEAMER FOR CONTROLLED TEMPERATURES BELOW 100° C.

By J. A. Samuel.

Department of Bacteriology, Medical School, Otago.

The solidification of serum and egg media should be done at the lowest practicable temperature, if growth-promoting factors are not to be destroyed. (1). At the same time, the atmosphere surrounding the tubes should be saturated with water vapour, in order to prevent undue drying-out of the medium. If the ingredients of a medium are almost free of organisms, as in a carefully prepared egg medium, and sterile tubes are used, the task of the steamer is firstly to coagulate and only secondarily to sterilise, hence it is desirable that all tubes be heated rapidly and at the same rate, so that heat may be applied for the minimum time found necessary. In the preparation of Finlayson's medium, (2) two heatings for 15 minutes at 80° C. "in the top of the Arnold" are considered sufficient. However, when large batches of medium are attempted, the steam gives up most of its latent heat to the tubes first encountered, and, apart from the difficulty of manually controlling the temperature, it is impossible to give all tubes equal treatment.

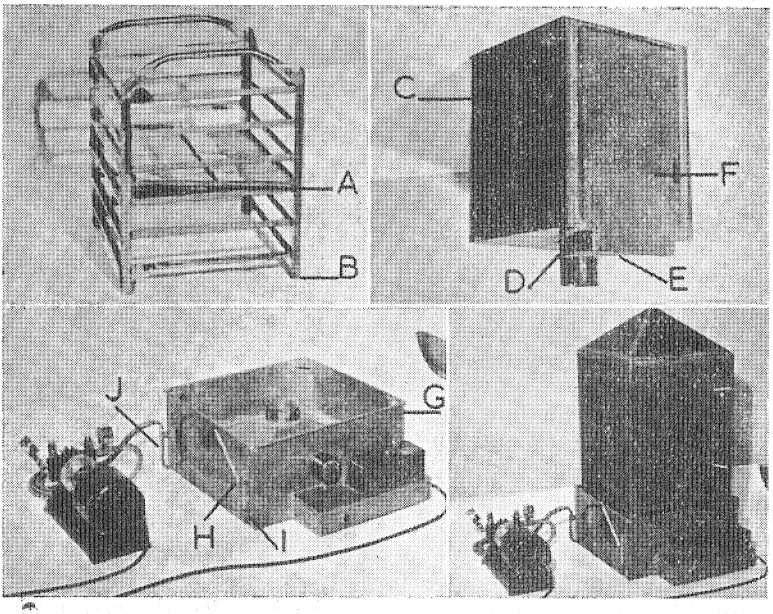
By blowing air into the water at the bottom of a steamer, it is possible to produce a vigorous stream of saturated air-water-vapour mixture at any temperature required, simply by thermostatically controlling the temperature of the water. Experiments along these lines led to the following modifications of a "Richmond" type of steamer (3).

Six trays of sheet copper (A), 16ins. square, $\frac{3}{4}$in. deep, and with sides to give a slope of $1\frac{1}{2}$in. in the 16in. length, were made. There is a division across the middle of each tray, so that two rows of 6in. plugged tubes or four rows of McCartney bottles can be taken (total load equals 250 $\frac{3}{4}$in. tubes or 350 McCartney bottles).

These trays slide into a rack (B) of sheet stainless steel as illustrated. The bottom tray being two inches from the foot, and the spacing between trays, three inches.

The whole rack slides snugly down into the inner chamber of the steamer (C). This chamber has been adapted, as a result of many experiments, to give a horizontal flow of steam between trays. The original chimney (D) leading steam into the chamber is blanked off, and a conduit (E) has been constructed to lead the steam up through the hollow wall (F) and thence through a patterm of holes into the inner chamber. The steam exits through holes in the opposite wall. The pattern of holes found by experiment to give equal rates of heating throughout the chamber is shown in the table.

If a steamer of different size is being constructed I should advise making the top row and the bottom two rows of holes as here, and then checking by experiment whether the rise of temperature is the same near top and bottom. Filling up a few holes with solder is a better way of altering the flow, than drilling more holes or enlarging existing holes.



Figs. 1, 2, 3, 4.

The inner chamber (C) is fed with air-water-vapour mixture by the boiler (G), chimney (D) having a very slight taper,

so as to fit quite snugly into the lower portion, while the weight of the inner chamber is actually supported by two bars at the bottom of the outer casing as in the original. The boiler is a re-design of the original, to accommodate electric heating elements, and to eliminate the multiplicity of short return tubes which were a weakness.

One tube at (H) extending almost to the bottom of the boiler, serves as filling tube and thermometer pocket. (I) is a sight glass. It is found that condensate from the outer-jacket evaporates before it can flow to the filling tube. However, this led to much less loss of water than in the original design with evaporation from its multiple return tubes. A Sunvic thermostat type T.S.2 with a 12in. pocket reaches into the pyramidal top of the steam space and controls a Sunvic Hot-wire Vacuum Switch Type 103-3.

This, in turn, controls the entire heating load of three 1-K.W. immersion heaters whose connections are hidden in the copper box in the foreground. A pilot light is necessary in setting the thermostat, and acts also as a warning light. Air is blown into the water via a half-inch tube (J) which extends into the boiler about six inches, thus heating up the air before it meets the water. The air flow promotes circulation of water past the heating elements. The complete steamer is shown in (Fig. 4) where the three thermometers referred to in the graph (Fig. 5) can also be seen. The original lid for the inner chamber had a number of exit holes. These were blanked off. The Edwards Type IV. Pump has an output of 87 litres per min. at N.T.P This air, when saturated at 80° C., carries away water vapour, requiring a heat input of 1 K.W. for its evaporation.

The heat carried away by the stream of air saturated with water vapour rises very steeply indeed above 70° C. (See Fig. 6). Note that, to raise the water temperature, from 82° C. to 89° C. the heat input would have to be doubled. This means that a stream of air blown into water has a very powerful thermostatic effect of its own. Indeed, a gas heated steamer can be made to run at 80° by simple manual control as soon as air is blown into the water.

This steamer was evolved from an existing one. A much simpler approach would be to retain the cage (B) and chamber as (C) with a uniform pattern of holes, and to divide the hollow wall (F) horizontally into three sections. Feed the steam and air from a separate small boiler of say, 1 gal. capacity, with constant level water feed, through three separate 1in. pipes to the three sections of (F). Large plug-cocks in these pipes could then

be set experimentally to obtain even heat distribution at all levels in the chamber. This setting would be permanent. The conduit (D) and (E) would of course be absent. Another hollow wall on the side of (C) opposite to (F) would collect the escaping steam and drain away the condensate. (C) could then be lagged and would not need the outer jacket.

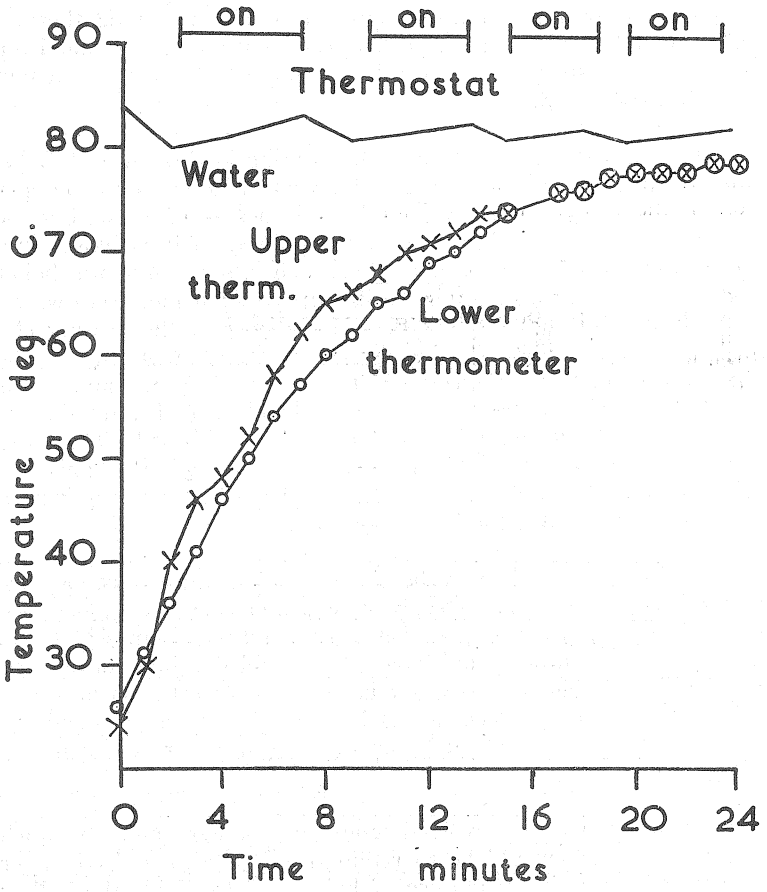


Fig. 5.

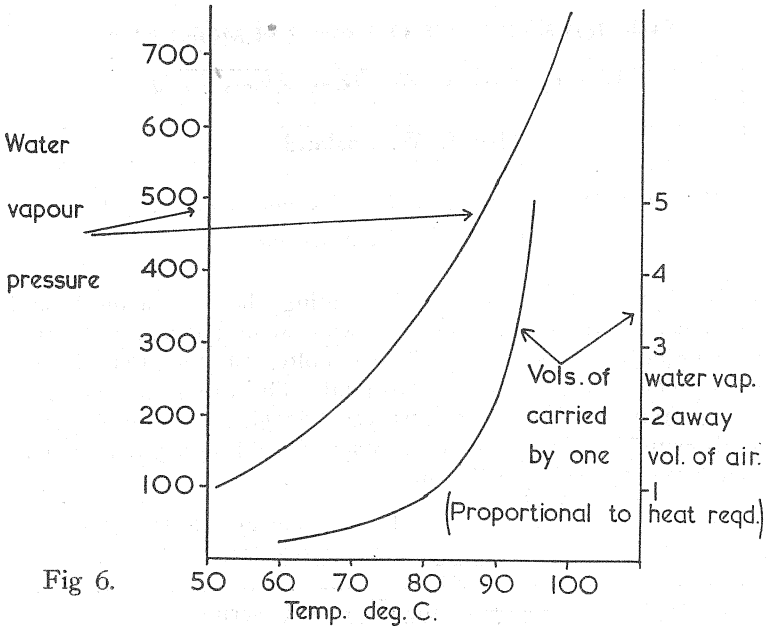


Fig 6.

PATTERN OF HOLES

Inches from bottom	No. of holes	Diam. of holes in.
$1\frac{1}{2}$	11	$\frac{1}{4}$
$4\frac{1}{2}$	7	$\frac{1}{4}$
$7\frac{1}{2}$	13	$\frac{1}{4}$
$10\frac{1}{2}$	13	$\frac{1}{4}$
$13\frac{1}{2}$	13	$\frac{1}{4}$
$16\frac{1}{2}$	13	3/16

Pattern of holes found necessary to give even distribution of heat at all levels. (This pattern was made necessary by the sudden bend in the conduit at the bottom, by the tendency for the steam to filter upwards between trays, and by the cross-section of the hollow wall being of the same order as the area of the holes.

Summary:

By blowing air into the water at the bottom of a steamer, and thermostically controlling the temperature, it is possible to make large batches of serum or egg slopes, with a minimum application of heat and with a reproduceable heating cycle. A redesign of the steamer is described, to facilitate loading and to ensure even distribution of air-water-vapour mixture throughout the load.

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THE IDENTIFICATION OF SALMONELLA SENFTENBERG IN NEW ZEALAND

By S. W. Josland,

Wallaceville Animal Research Station, Department of Agriculture, New Zealand.

In April, 1953, a culture exhibiting the biochemical and serological reactions of a salmonella was submitted to this Station for identification by Mr. J. T. Connolly, of the Pathological Department of the Auckland Hospital The organism had been isolated from the faeces of an 18-year-old girl, who recently had had dysentery. The girl was a contact of her brother, from whom Shigella sonnei had been isolated.

Serological Investigation: The organism was agglutinated by all somatic sera containing factor III. (III. X.-I. III. XIX.-III. XV.). It was also agglutinated by factor I. II. XII. serum (S paratyphi A) and by a single factor I. serum.

Single factor sera for "O" agglutinins X. X.X. and XV. were prepared, and agglutination was obtained with factor XIX. serum prepared from S senftenberg (I. III. XIX.) by absorption with antigens I. II. XII. (S. paratyphi A) and III. (X. (S anatum).

The complete "O" antigens were therefore I. III. XIX., and the organism was shown to exhaust these agglutinins from a serum prepared from S senftenberg. For determination of the flagellar antigens the organism was passed through semi-solid agar to improve motility. Formalinised broth cultures were agglutinated by all sera containing factor g and by single factor sera for factors s and t. Emulsions were agglutinated to titre by flagellar serum g s t. The complete antigens were therefore I. III. XIX.; g s t;—, which are those of S senftenberg. Confirmation of this identification was obtained from Dr. P. R. Edwards, bacteriologist-in-charge of the Enteric Reference Unit, United States Public Health Service, Chamblee, Georgia.

Discussion: S. senftenberg was isolated and identified by Kauffman (1930) in 1929 from an eight-year-old boy suffering from gastro-enteritis. It was subsequently found in the United States in young turkeys suffering from an epidemic disease (Edwards, 1937) and in chickens (Edwards, 1939). It has been found in retail meat in the United States (Cherry, Scherazo and Weaver, 1943), and in the mesenteric lymph glands of normal

pigs in Mexico (Varela and Zozaya 1942). Edwards, Bruner and Moran (1948) have recorded 55 outbreaks in turkeys, six outbreaks in chickens, seven outbreaks in swine and 12 outbreaks in man in the United States due to this salmonella, eight cultures of which were also recovered in Great Britain among 840 salmonella cultures isolated from imported American spray dried egg (M.R.C. report, 1947). In Australia one culture of S. senftenberg from a child with diarrhoea was identified by Atkinson, Woodruffe and Macbeth in 1949. This organism has not yet been isolated from material of animal origin in Australia or New Zealand.

S. senftenberg is closely related to S. simsbury (I. III. XIX.; Z_{27}; —). This relationship is of considerable phylogenetic interest, and Edwards, Moran and Bruner (1947) were able to transform S. simsbury into S. senftenberg by growth in media to which the flagellar agglutinins Z_{27} of the former had been added. Conversely S. senftenberg could be transformed into S. simsbury, this charge being accomplished by changing the H. tntigens to a hitherto unrecognised form (Z_{34}) and then changing them to Z_{27}. These antigenic changes produced by induced variations are of importance as it is likely that monophasic salmonella may occasionally give rise in nature to induced variants. Although S. senftenberg and S. simsbury are thus joined they continue to be listed separately in the Kauffman White antigenic schema (1950) and as Kauffman (1951) has pointed out, the epidemiological significance of the various salmonella types is well established, and observations such as the induced variational change from S. senftenberg to S. simsbury in no way detract from the value of antigenic typing in the study of Salmonella infections. For that reason the types are at present listed in the schema as they occur in nature.

Summary: The identification of S. senftenberg isolated from a human source in New Zealand is reported.

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THE NATURE OF AN UNUSUAL PIGMENT IN URINE.

By Miss J. Mattingley,

Department of Pathology, Wellington Public Hospital.

The abnormal colours of urines received for analysis, porphyrinuria, haemoglobinuria, etc., are sometimes found to be due to the presence of anthocyanin derivatives found in coloured foodstuffs such as beetroot.

Anthocyanins are pigments responsible for most of the red, blue and violet colours of plants. They are glucosidic and when boiled with dilute mineral acid yield one or more sugars and a sugar-free pigment, an anthocyanidin. Pigments are red in acid solution and blue in alkaline, but these colours may be modified by the presence of co-pigments and salts. Their absorption maxima lie between 500 and 550 mμ.

The four specimens received in this laboratory over the past year were all sent with a history of no obvious clinical cause for the excretion of coloured urine. Poole has reported a case which he considered to be due to changed permeability of the kidney after nephritis.

Urines analysed here have had the following characteristics: Colour red, yellow with a pinkish tinge, dark greenish-blue (apparently dependent on pH). Albumin absent; deposit normal, porphyrins present in normal amounts only; no haemoglobin derivatives present; no absorption bands present. The colour was extracted by neither amyl alcohol nor ether. Addition of conc. HCl to the specimen gave a red colour. Addition of conc. NaOH gave a yellow colour, which on standing sometimes became bluish. The colour changes were reversible. To verify the presence of anthocyanin

compounds equal parts of urine and conc. NaOH were refluxed for half an hour and then distilled. A very strong smell similar to that yielded by a growth of *B. pyocyaneus* was evident. The first three c.c. of distillate gave a positive reaction for phenols with sodium carbonate and Folin and Ciocalteau re-agent.

These findings are in accordance with the reaction of anthocyanidins, which on heating with conc. alkali, yield two aromatic products, a phenol and carboxylic acid. All anthocyanidins so far investigated have yielded phloroglucinol or its monomethyl ester as the phenol. The second component depends on the amount of oxygen in the original substance.

The above reactions were checked with a watery extract of beetroot. Random selection of normal urines from those received for routine analysis gave neither the characteristic smell nor the phenol reaction on refluxing and distillation with conc. alkali.

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TERRAMYCIN

More than 90 per cent. of the prescriptions written by physicians to-day could not have been filled 15 years ago — the drugs just did not exist. That is how rapid has been the development of new drugs during the past decade and a-half.

During the same period, and as a result of these new drugs, we have seen diseases that were formerly dreaded killers, brought under the physicians' control. The fatalities from meningococcal meningitis for example, have been reduced from 40 per cent. to 5 per cent.; more than half of the cases of bacterial endocarditis, practically 100 per cent. fatal 15 years ago are now curable; and pneumonia, long a number one killer is now much less frequently a cause of death.

We of course are reaping the benefits of the basic research by such pioneers in biology and chemistry as Koch, Pasteur and Ehrlich, whose discoveries made possible the techniques used in the research laboratories to-day.

Britain's Sir Alexander Fleming accidentally discovered penicillin—the first anti-biotic, in 1929. But the discovery of Penicillin's succesosrs, Streptomycin, Auremycin and now Terramycin, was made only after organised and intensive research.

The antibiotic, Terramycin, started in the mycologists's laboratory. To this laboratory came a steady stream of soil samples from all over the world. The small packets of earth came from missionaries, travellers, airline pilots and explorers.

When the samples arrived they were carefully coded and a small amount of soil suspended in sterile distilled water in a flask. In order to separate the various moulds the mycologist places a drop or two of the soil water suspension on an agar plate and incubates it. After a few days he examines the cottony tufts of mould growth that have thrust themselves up from the nutrient. Any colony that looks at all promising is isolated for further study.

In the course of a week several hundred such colonies may be selected for further study. The desired colony is pricked off with a sterile needle, placed on a solid medium in a test tube and further incubated to assure absolutely pure culture. The pure culture is then transferred to a sterile flask, containing nutrient broth and again incubated for further growth. A liquid medium is necessary at this point since an anti-biotic substance cannot be extracted from a solid medium.

After two or three days of incubation the bacteriological assay laboratory takes over. This is the first crucial point in the life of a future antibiotic. Has the selected colony produced an antibiotic substance?

A paper disc, soaked in the nutrient broth in which the mould has grown is placed on an agar plate streaked with established cultures of pathogenic organisms.

A representative sample might include a Staphyclococcus, Streptococcus, Pneumococcus, Meningocossus and possibly an H. pertussis. Antibiosis is indicated by inhibition of bacterial growth where the streaks approach the disc containing the antibiotic solution.

It was after this prolonged and painstaking process had been carried out on 100,000 soil samples that an actinomycete, Streptomyces rimosus—so called because of its cracked appearance of the growth on agar medium—yielded an antibiotic of outstanding promise. Terramycin was discovered.

Terramycin has an empirical formula approximately to C_{22} H_{24-26} O_2N_2. It is amphoteric and forms a crystalline yellow hydrochloride and a crystalline lemon-yellow sodium salt.

In the form in which it came into therapeutic use, Crystalline Terramycyn Hydrochloride occurs as a bright yellow powder, soluble in water and common organic solvents. In dilute aqueous solution, Terramycin Hydrochloride is very stable. At pH 1.0 to 2.5, there is no detectable loss of activity at 5° C. or at 25° C. for at least 30 days; samples stored at 5° C. at pH 3.0 to 9.0 show no detectable loss over a similar period.

In the dry state both Terramycin Hydrochloride and its hydrochloride are remarkedly stable for two years.

Terramycin is effective against both gram positive and gram negative micro-organisms, aerobic and anaerobic, against spirochaetes, rickettsiae, some of the larger virus, and indirectly against certain of the protozoa.

The various forms of Terramycin already in use in New Zealand include Capsules, Elexir, Oral Drops, Otic Solution, Intravenous, Ophthalmic Ointment and Solution and Troches.

This antibiotic—Terramycin—was discovered in the laboratories of Chas. Pfizer and Co. Inc., who supplied Penicillin to New Zealand during World War II.

(This information was supplied by A. M. Satterthwaite & Co., Ltd., Christchurch).

SOME EXPERIENCES WITH LEPTOSPIRA.

By J. A. Samuel,

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Media and methods for Leptospira are outlined in Mackie and McCartney, 8th edition, 2nd reprint, but in view of the greatly increased interest in Leptospirosis in N.Z., some details regarding the handling of these organisms are presented here. I have had no experience of isolation of Leptospira, and little with agglutinations, but the techniques which I found essential in the propagation of these organisms are of general interest. Few hospital laboratory workers have occasion to keep an organism on fluid culture continuously, and in any case, most organisms can be cultured in parallel on solid media to test purity. When it is attempted to keep cultures of Leptospira going continuously, the difficulties are multiplied considerably.

Medium.

Although Leptospira can be trained to grow on a variety of media from nutrient agar diluted 1 in 10, to buffered media containing haemoglobin and pooled serum in concentration from 7% to 15%, they dislike sudden changes of medium, and in fact, will usually refuse to grow if the medium is changed.

Inoculum.

Although these organisms can be induced to grow from small inocula in a favourable medium, large, vigorously growing inocula are in effect a necessity.

Contaminants.

Media designed for Leptospira do not support vigorous growth of most contaminants, nevertheless, contaminants will always outgrow the Leptospira, and a single contaminating organism is fatal either immediately, or on a later sub-culture. Methods which we are accustomed to use in transfer of organisms from one tube to another are not good enough for Leptospira. Even exercising the utmost care will not *ensure* a sub-culture free from contaminants, so leptospira cultures are always carried in triplicate.

Then, if one, or even two tubes are contaminated at any time, it is still possible to retrieve the culture from another tube.

Checking growth.

As a heavy growth of Leptospira is quite invisible to the naked eye, even in a water clear medium, and the organisms cannot be

conveniently stained, it is necessary to use a dark-ground microscope. The magnification need not be high—1/6th obj. and X10 eyepiece, or even 2/3rd objective. If the dark ground condenser is of a type which covers a large field, so much the better. Water immersion of the condenser is sufficient, and preferable to oil, as there is no need to clean the condenser and slides between examinations. If water immersion of the condenser is used, the 1/6th objective may have too great numerical aperture. A black paper diaphragm can be put in the back of the objective, having a hole burned with a needle to the diameter found by experiment to give satisfactory dark-ground effect. Observe all the usual precautions in dark-ground work—keep a stock of thin clean slides and covers in alcohol—discard covers and slides into different containers of weak lysol or 10% Teepol. Slides and covers can then be rinsed and transferred to alcohol as necessary. When changing slides under the microscope, swing the 1/6th aside *without altering focus,* put another drop of water on the condenser, position the slide, and swing the 1/6th back into position This saves time, and reduces the risk of touching the cover. If the slides are selected to be of roughly equal thickness—say, 0.8 to 0.9mm—focus can be found very easily. Discard any slides or covers with any veiling of the surface, as these will obscure the Leptospira, and may simulate contamination.

Sampling Cultures.

It is important to use a technique of sampling the culture which will give uniform results under the microscope, and give a good idea of the activity of the organisms, and their numbers. After a little experience, it is sufficient to examine drops of the culture with the 2/3rd objective, without cover slip. To begin with, I would advise using the 1/6th and a cover-slip. Always lift the loop horizontally out of the culture, thus getting a lenticular drop of constant size, and use a loop of such a size that the cover slip just floats on the drop. This gives plenty of room for the organisms to swim in. (It is easy to immobilise the Leptospira if they are squeezed between the cover and slide through using too small a volume). Do not shake the culture before sampling, or dredge up the immobile organisms from the bottom of the culture, but take a loopful from the top.

Preparation and Dispensing of Media.

Serum concentration: There is no need to use more than 7% pooled, inactivated, rabbit or guinea pig serum. (Leptospira will grow in concentration from 7% to 15%, but a change in serum concentration requires training of the organisms). As

serum in such quantity for the large volumes of medium necessary for agglutinating emulsions will be the usual bottle-neck, it is best to avoid a concentration above 7%.

Haemoglobin: A drop of red cells in 1 to 5 cc. of medium is very useful in boosting a reluctant culture, and serum showing haemolysis is therefore no disadvantage. However, for agglutinating emulsions it is necessary to avoid haemoglobin, as it may give a granular deposit or a hazy culture.

Peptone: Although Schuffner's medium uses Witte's peptone, I have always substituted Neopeptone as this is the least toxic peptone.

Buffers: Again, Leptospira can be trained to grow in Schuffner's medium (buffered, with serum and peptone) or in glass-distilled water plus serum, or even in tap-water plus serum.

Agar: Media containing a trace of agar have been advised, as the organisms then grow in a visible narrow layer about one centimeter from the surface, demonstrating a preference for an oxygen tension lower than atmospheric. As a medium containing agar cannot be used for agglutination, it is of little practical interest, but the swarming in a narrow layer is remarkable.

Training a culture on a new medium:

One culture we received from the N.T.C.C. was in a medium found on enquiry by cable to be Nutrient Agar diluted 1 in 10. This culture defied our efforts to sub-culture on Schuffner until one drop of Schuffner was added to three drops of the original. This gave some multiplication. A few drops of Schuffner were again added after about four days, giving further growth, and finally a sub-culture was made by adding one volume of culture to three volumes of Schuffner.

This method is the one to follow when dealing with a new stock culture. Do not use the entire stock as the inoculum, but retain about 2/3rds of it for emergency. Transfer a few drops to a small tube, add an equal volume, or less, of your medium, and examine after four days. Add several drops of medium, incubate a further four days, and examine again. If these techniques give an actively growing culture, make three parallel sub-cultures in the usual way, i.e., using one volume of the inoculum to about five volumes of medium.

Utensils:

I have already stated that very great care is needed in transfer of culture to avoid contamination: The ideal container would

be a bottle with two screw caps, rather like some Cognac bottles. The outer cap would enshroud the neck and inner cap, and the whole neck and inner cap would then be sterile even on the outer surface. The next best is the McCartney bottle with a paper cap over the screw cap and neck. This excludes gross contamination such as dust. All containers must be scrupulously clean and must be filled with strict aseptic precautions, preferably through a hooded pipette directly from a seitz filter. See Mackie McCartney, 8th ed., p. 161. I prefer to autoclave all apparatus immediately before use, the final containers with their paper caps in place. Add the inactivated pooled serum to the bulk medium, Seitz filter the whole, and deliver via hooded pipette to the capped bottles. It is most important that the final medium be free from any artefact by dark-ground. A cloudiness or deposit can simulate contamination or so spoil the dark-ground image that the leptospira can hardly be seen. All medium must be incubated at 30° C. for four days to check sterility.

As cultures must be carried in tricplicate, keep the volume of each culture down to one to five cc. It is a temptation to use corked W.R. tubes to economise in medium—avoid this, as corked tubes cannot be flamed effectively before opening.

If possible, use McCartney "Bijou" or 1oz. bottles.

Although the organisms are microaerophilic, there is no need to worry about air space above the culture, or the depth of the medium, at any rate, when the inoculum is large and vigorous.

Bulk Cultures:

Say we want a litre of agglutinable suspension. We begin with one cc. of a month-old culture—Sub-culture 0.2 cc. of this into 1 cc. of medium.

Incubate four days and transfer the whole of this to 5 cc. of medium.

Incubate four days and use this culture as the inoculum for 20 cc. medium.

Incubate four days and transfer to 100 cc. medium.

Incubate four days and transfer to 1 litre of medium.

Check by dark-ground at every step.

Incubation Temperature and Frequency of Sub-culture:

The optimum incubation temperature is 30° C.

Sub-cultures should be made at intervals of two weeks to four weeks, for maintenance of stocks. These stock cultures tend to be a little sluggish on first sub-culture, hence the above procedure for bulk culturing.

SUMMARY:

The foregoing may seem a rigmarole, but I have endeavoured to mention all the pitfalls which are not obvious from textbook accounts.

1. Train new cultures by using *large* inocula.

2. Keep some of the original until sub-cultures are checked satisfactory.

3. Make all subsequent sub-cultures in triplicate.

4. Test all cultures at four days by dark-ground.

5. Sub-culture stock cultures at two to four weeks, checking again by dark-ground before sub-culturing.

6. Use a standardised dark-ground technique.

7. All containers must be scrupulously clean and free from cleaning agents.

8. Exercise the most rigorous aseptic techniques when opening or transferring cultures.

9. Incubate at 30° C. and keep stocks at room temperature in the dark.

10. Use the best medium available in making and dispensing the medium and incubate all medium check for contamination.

11. Stick to one medium, and do not alter any component.

12. Never reduce the inoculum below 1/10th of the succeeding culture volume.

13. Remember that there have been such things as laboratory infections with leptospira.

14. (Perhaps) in words attributed to one of the pioneers, put up a notice: NOTOUCHI! NOGOUGHI!

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The work with Leptospira was done while the author was in the employ of the Medical Research Council, Leptospira Reference Laboratory, Medical School, Dunedin.

PARASITES FOR COCONUT PEST.

Scientists collaborate throughout the world in the use of beneficial insects — parasites that destroy noxious insects and weeds—and recently New Zealand entomologists sent to the Pacific Islands parasitic insects that were introduced into and reared in New Zealand.

A consignment of nematode parasites left Wellington recently by flying boat for Noumea. These eel-worms, which are scarcely visible to the naked eye, will be used in the attempted control of the Rhinoceros Beetle in the coconut plantations of the Pacific Islands.

The nematode was introduced into New Zealand for field trials in the biological control of our native grass grubs. This consignment was reared at the Entomological Research Station of the Department of Scientific and Industrial Research at Ashburton, and dispatched to the Quarantine Officer, South Pacific Commission at Noumea.

The Rhinoceros Beetle has long been a serious pest of coconuts in Samoa, but in recent years it has spread to other islands, notably Fiji. The beetle is a direct threat to the welfare of almost all the Pacific Islands since the coconut palm is the basis of their economy.

(*Press release from Infomation Bureau, Department of Scientific and Industrial Research*).

GRADE LABORATORY OFFICERS:

Would all Grade Officers who are willing, please forward details of their grading to the Hon. Secretary of the Association.

MINUTES OF A MEETING OF THE COUNCIL, N.Z.A.B., AT WELLINGTON HOSPITAL, AT 10 a.m. ON SATURDAY, 18th APRIL, 1953.

Present:

Messrs. Whillans, Adamson, Buxton, McKinley, Olive, Rush-Munro, Reynolds, Samuel and Miss Scott.

Minutes of the Council Meeting of 6th August, 1952, were confirmed. (Whillans-Buxton).

Honorary Members:

Existing Members are to be notified of their continuing membership, and any new members are to be by appointment only. (Miss Scott, Rush-Munro).

New Members:

The following were elected Junior Members of the Association: Miss M. P. Kynoch, Waipukurau; Miss J. Speden, Medical School; Mr. P. Snow, Christchurch; Miss S. Sinclair, Medical School; Mr. E. Stephens, New Plymouth; Mr. B. Smith, Oamaru; Mr. T. Tanner, Miss C. Curtis, Miss H. McRae, Miss R. Jenkin, Miss J. Maitland, Miss M. Crozier, Christchurch; Miss P. Soderson, Medical School; Mr. J. Lyon, Wanganui; Miss H. Mackenzie, Miss J. Skerrett, Mr. K. Watts, Mr. G. Moss, Mr. G. Chambers, Mr. G. Davis, Auckland.

Resignations:

Miss J. Yates, Miss M. Scott, Miss E. Hicks, Miss B. Stabler and Mr. W. Swanson.

That the above new members be elected, and the resignations received with regret. (Reynolds-Adamson).

Outward Correspondence:

Confirmed. (Adamson-Olive).

Inward Correspondence:

Received. (Buxton-Rush-Munro).

Arising from the correspondence the Council decided that the Association typewriter be made available to the Journal Commit-

tee, and that this Committee be granted the sum of £5 to establish a petty cash account to facilitate the posting of Journals and Journal Correspondence.

The Journal Committee now consists of: Miss Joan Byres, Mr. I. Cole, Mr. J. Sloan, and Mr. A. Murphy (Editor).
(Buxton-Rush-Munro)

Pathologists' Conference, Hamilton, May, 1953:

Mr. Whillans (President), and Mr. McKinley (Hon. Secretary) were appointed to attend. (Olive-Buxton).

Examiner Intermediate Examination, June, 1953:

The appointment of Mr. McKinley was approved.
(Olive-Rush-Munro)

A tentative list of examiners is to be prepared in time for the next Council Meeting. (Olive-Miss Scott).

Salaries Advisory Committee, Representatives and Deputies:

That the present members and deputies continue as the Association's Representatives. (Reynolds-Adamson).

The Association has no submissions for S.A.C. this year. Mr. Olive was asked to see the Secretary of S.A.C. and ask him for an interpretation of the Sick Leave Clause in the Regulations.

Conference, 1953:

Thursday and Friday, 16th and 17th July, at Christchurch.

The Council will meet in Christchurch on 15th July, 1953.

The following Conference Committee was approved, with power to co-opt: Messrs. Adamson, Murray, Cameron, Corey, Till, Don and Miss Curtis. (Olive-Buxton).

The principle of a Trade Display at the 1953 Conference at Christchurch was approved. (Samuel-Olive).

Mr. Olive was directed to convey the thanks of the Council to the appropriate Wellington Hospital Authorities for the facilities afforded us for the Council Meeting. (Whillans-Buxton).

The Meeting concluded at 2.45 p.m. with a vote of thanks to the Chair.

EXAMINATION RESULTS

CERTIFICATE OF PROFICIENCY EXAMINATION, WELLINGTON, 3rd-5th SEPTEMBER, 1952.

SUCCESSFUL CANDIDATES:

Armstrong, M. E., Miss (Auckland)
Connolly, J. T., Mr. (Auckland)
Donnell, M. McL., Mr. (Auckland)
Evans, L. E., Miss (Christchurch)
Kershaw, F. C. Mr. (Dunedin)
Laws, J. L., Miss (Auckland)
Lindsey, M., Miss (Palmerston North)
McCallum, P. K., Miss (Christchurch)
Savage, D., Miss (Auckland)
Strickland, B. M., Mrs. (Auckland)

CERTIFICATE OF PROFICIENCY EXAMINATION, DUNEDIN, 23rd-25th FEBRUARY, 1953.

SUCCESSFUL CANDIDATES:

Barry, B., Mr. (Hamilton)
Horner, J. E., Mr. (Wellington)
Jones, R. W., Mr. (Gisborne)
Mackay, B. Miss (Auckland)
Millar, D. W., Mr. (Wellington)
Morgan, J. Mr. (Dunedin)
Morrish, J. E., Miss (Christchurch)
Sayers, A. M., Miss (Auckland)
Smith, D. C., Mr. (Wellington)
Smith, M. H., Miss (Wellington)
Whelan, H. M., Miss (Wellington)

INTERMEDIATE EXAMINATION, 12th-13th JUNE, 1953.

SUCCESSFUL CANDIDATES:

Cannon, J., Mr. (Christchurch)
Cross, J., Miss (Invercargill)
Don, W., Mr. (Christchurch)
Duncan, J., Miss (Wellington)
Grace, A. Mr. (Wellington)
Reid, A. D., Miss (Auckland)
Sinclair, S., Miss (Dunedin)
Wales, R. E., Mr. (Wellington)
Walker, J. A., Mr. (Christchurch)
Winders, G. B. (Invercargill)

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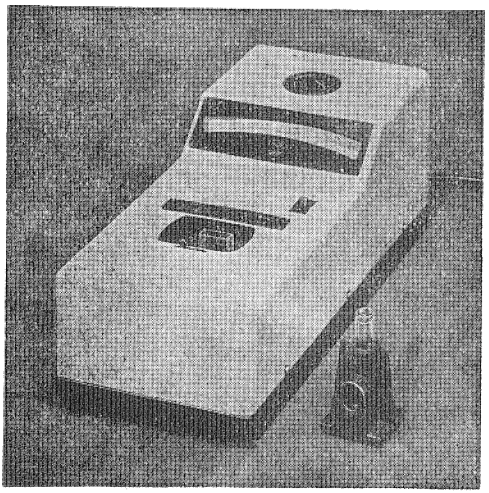

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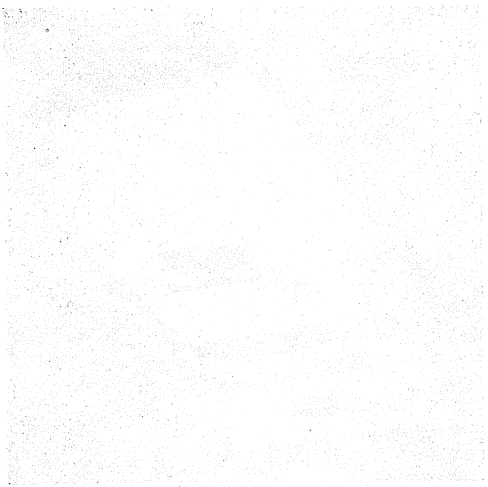

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