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THIRD SCIENTIFIC MEETING

16th May, 1964

SURGICAL RESEARCH SOCIETY OF AUSTRALASIA

QUEEN ELIZABETH HOSPITAL
Woodville, South Australia

THIRD SCIENTIFIC MEETING

SURGICAL RESEARCH SOCIETY OF AUSTRALASIA

16TH MAY, 1964.
Queen Elizabeth Hospital,
Woodville, South Australia.

PROGRAMME

9.00 a.m.	INTRODUCTION AND NOTICES
9.15 a.m.	PAPERS:
	"The Effect of Osmolar Loads on Gastric Secretion" - P. Halliday, Sydney.
9.30 a.m.	"The Effect of Aspirin on Explanted Gastric Mucosa" - F. O. Stephens, Sydney.
9.45 a.m.	"The Role of Tetracycline Fluorescence in the Diagnosis of Gastric Cancer" - H. Ross, Melbourne. (Visitor)
10.00 a.m.	"The Experimental Production of Ascites" D. L. Annetts and G. D. Tracy. To be delivered by - D. L. Annetts, Sydney. (Visitor)
10.15 a.m.	"Relation Between Daily Output of Gastric Juice and Maximal Secretory Capacity" - G. W. Milton, Sydney.
10.30 a.m.	"The Effect of Bile on Trypsin and Trypsinogen in Pancreatic Juice" - R. G. Elmslie, Sydney. (Visitor)
10.45 a.m.	MORNING COFFEE
	DEMONSTRATIONS -
	Animal House, Queen Elizabeth Hospital, and Department of Surgery.
	1. Ionic Transport

2. Mitochondrial Study

3. Steroid Excretion in Breast Cancer

4. Yttrium Implantation of the Pituitary

5. A Rotary Pump for use in Vascular Operations

6. T.S.H. Assays

7. Immune Responses by Lymphocytes

8. Studies of Rectal and Bladder Pressures

9. Medical Art

11.15 a.m. PAPERS:

"Pathogenesis of Gallstones"

- W. Burnett, Brisbane.

11.30 a.m. "Epidemiology of Uric Acid Stone"

- W. D. Proudman, Adelaide. (Visitor)

11.45 a.m. "HCO_3 - CO_2 Turnover in Man"

- J. L. Opit, Adelaide.

12.00 noon "The Use of Micro-Angiography in Renal Investigation"
J. Maddern and C. J. Schwartz.
To be delivered by
- J. Maddern, Adelaide. (Visitor)

12.15 p.m. "The Isolated Ileal Loop as a Third Kidney"

- S. C. Hopcroft, Adelaide. (Visitor)

12.30 p.m.	"The Ventilation Equivalents as a Measure of Efficiency of Ventilation in Surgical Patients" - V. C. Marshall, Melbourne.
12.45 p.m.	LUNCHEON and TOUR OF QUEEN ELIZABETH HOSPITAL.
1.45 p.m.	PAPERS:
	"The Effect of Cytotoxic Drugs on Blood Volume" T. S. Reeve, P. C. Vincent, Nea Brittle and Annette Nicholls. To be delivered by - T. S. Reeve, Sydney.
2.00 p.m.	"Experimental Attempts to Reverse the Arterio-Venous Circulation" - P. Ryan, Melbourne. (Visitor)
2.15 p.m.	"The Normal Function of the Veins of the Lower Limb" - J. Ludbrook, Sydney.
2.30 p.m.	"Fluid Shift in a Three Compartment System" - K. R. Cox, Melbourne.
2.45 p.m.	"Vascular Transplants and Mitral Valve Replacement" - J. S. Wright, Sydney. (Visitor)
3.00 p.m.	"Anoxia and Cold. Effects on Cardiac Muscle Experimental Studies Applied to Cardio-Pulmonary Bypass" - V. Hercus, Sydney. (Visitor)
3.15 p.m.	TEA

3.30 p.m. PAPERS:

"The Use of Heated Thermistors in the Measurement of Tissue Blood Flow"

- G. M. Davidson, Sydney. (Visitor)

3.45 p.m. "Evaluation of a Stable Hypochlorite ("Milton") as a Wound Irrigant"
P. C. Vincent, T. S. Reeve & Annette Nicholls.

To be delivered by
- T. S. Reeve, Sydney.

4.00 p.m. "Low Temperature Sterilisation of Linen Dressings and Instruments by Dry Heat"

- N. Bonnin, Adelaide. (Visitor)

4.15 p.m. "Thyroxine and Protein Synthesis"

- J. S. Charnock, Adelaide, (Visitor)

4.30 p.m. ANNUAL GENERAL MEETING

Agenda--

1. Apologies
2. Confirmation of the Minutes of the Meeting on May 27th, 1963.
3. Correspondence.
4. Business Arising from Minutes
5. Future Finance
6. Constitution

7. New Members Proposed

Name	Proposed	Seconded
a. Corresponding Member		
Mr. G. B. Ong	Mr. K. R. Cox	Prof. Ewing
b. Members		
Mr. W. Egerton	Prof. Burnett	Mr. D. Leaming
Mr. L. Hughes	Prof. Burnett	Mr. D. Leaming
Mr. S. Mellick	Prof. Burnett	
Mr. J. Nayman	Prof. Dudley	Mr. K. R. Cox
Mr. J. P. Masterton	Prof. Dudley	Mr. K. R. Cox
Dr. V. Hercus	Assoc. Prof. Tracy	Assoc. Prof. Johnston
Mr. G. Davidson	Assoc. Prof. Tracy	
Dr. R. Emslie	Assoc. Prof. Tracy	
Mr. J. Clarebrough	Mr. K. R. Cox	Prof. Ewing
Mr. P. Ryan	Mr. K. R. Cox	Prof. Ewing
c. Associate Member		
Mr. R. Hollings	Assoc. Prof. Reeve	Assoc. Prof. Tracy

8. General

9. Date of Next Meeting

6.30 p.m. DINNER
University Staff Club.

ABSTRACTS OF PAPERS

1. 9.15 a.m.

"THE EFFECT OF OSMOLAR LOADS ON GASTRIC SECRETION"

- P. Halliday, Sydney.

The effect of osmolar loads on gastric secretion has been studied in cats using the technique described by Milton, Skyring and George. Osmolar loads were based on an estimate of the total body water and were intended to raise or depress the plasma osmolarity by 10 mOsm/L. Both the hyper and hypo-osmolar loads produced statistically significant changes in the rate of secretion of some but not all the electrolytes in the gastric secretions. These results have been analysed to throw further light on Hollander's two-component theory of gastric secretion and the possible contribution of a transudate to the cellular secretion.

NOTES:

2. 9.30 a.m.

"THE EFFECT OF ASPIRIN ON EXPLANTED GASTRIC MUCOSA"

- F. O. Stephens, Sydney.

Many animal experiments have been performed to study the effect of oral and parenteral administration of salicylates on gastric mucosa. Although much is known about the macroscopic and microscopic changes of mucosa in response to aspirin, little is known about the effect of aspirin on gastric secretory function. In these experiments a section of gastric wall with intact blood supply was explanted on to the abdominal wall in 16 dogs. The effect of direct application of powdered aspirin onto the explants was studied. It was found that aspirin caused an inhibition of the acid secretion in response to histamine. This inhibition preceded, but was rapidly followed by, a severe superficial inflammation which resulted in loss of surface epithelium. The findings indicate that an acute aspirin gastritis is not the result of excess acid secretion as has been suggested.

NOTES:

3. 9.45 a.m.

THE ROLE OF TETRACYCLINE FLUORESCENCE IN THE DIAGNOSIS OF GASTRIC CANCER"

- H. Ross, Melbourne,
(Visitor)

The tetracycline family of antibiotics fluoresce in ultraviolet light producing a yellow colour. This can be detected in gastric washings after a short course of one of the tetracyclines in therapeutic doses.

It is claimed that the presence of fluorescent material in gastric washings after a suitable interval following a course of tetracycline indicates a malignant stomach lesion rather than a benign one.

The clinical application of this property of persistent fluorescence in gastric cancer as a diagnostic test has produced variable results by different workers.

We are attempting to establish the accuracy of a clinical test based on these principles and have studied fifteen cases of gastric pathology, seven of which were gastric carcinomas. Our results have been encouraging and suggest the test may have some clinical applications.

NOTES:

4. 10.00 a.m.

"THE EXPERIMENTAL PRODUCTION OF ASCITES"

D. L. Annetts and G. D. Tracy.

To be delivered by
D. L. Annetts, Sydney.
(Visitor)

Up to recent times, there has been no adequate rationale for surgical treatment of ascites due to cirrhosis. Many factors other than portal hypertension have been implicated. Failure to produce ascites from experimental portal vein occlusion had been noted. However, recent evidence has pointed to hepatic congestion, result from post-sinusoidal hepatic venous occlusion as a prime cause of ascites and has rekindled interest in portacaval shunts for the treatment of this condition.

In this experiment, several methods have been tried to produce similar hepatic outflow block in the dog. Four methods were tried to produce hepatic venous impedance, but only one has proved to be reproduceable with reasonable animal mortality.

The methods investigated include-

1. Supra-hepatic inferior vena caval constriction.
2. Intra-caval hepatic vein occlusion with a plastic cannula.
3. Hepatic exclusion with caval by-pass.
4. Direct hepatic vein ligation and division.

Ascites was produced successfully in these experiments, in which the resulting changes in portal pressure were recorded. Different shunting operations were tried to assess their relative value.

NOTES:

5. 10.15 a.m.

"RELATION BETWEEN DAILY OUTPUT OF GASTRIC JUICE AND MAXIMAL SECRETORY CAPACITY"

- G. W. Milton, Sydney.

It is usually presumed that the maximal secretory capacity of the stomach bears a direct relationship to the average daily secretion. This presumption may not be valid. The present investigation, using four Heidenhain pouch dogs, studied the average daily secretion over a period of more than four months and compared these with the maximal secretory capacity as measured by repeated tests for maximal secretion. These tests consisted of doubling dose histamine test in the fasted and in the recently-fed animal, and the response to a meat meal without histamine.

NOTES:

6. 10.30 a.m.

"THE EFFECT OF BILE ON TRYPSIN AND TRYPSIN AND TRYPSINOGEN IN PANCREATIC JUICE"

- R. G. Elmslie, Sydney.
(Visitor)

There is a division of opinion on the ability of bile of activate trypsinogen. The effect of bile on the activity pattern of trypsin has not been studied. Human, dog, sheep and goat gall bladder bile was incubated with human pancreatic juice and failed to activate the trypsinogen. On the other hand, it was found that bile altered the activity pattern of human trypsin by prolonging the activity time. The significance of these findings will be discussed.

NOTES:

7. 11.15 a.m.

"PATHOGENESIS OF GALL STONES"

- W. Burnett, Brisbane.

An analysis has been made of the various constituents of bile thought to be concerned in gall stone formation in man. Normal and pathological hepatic and gall bladder bile have been studied. Particular interest was taken in cholesterol, phospholipid, protein and the bile salts determined by partition chromotography as glycin or taurine conjugates of cholic, chenodesoxycholic or desoxycholic acids. Analysis of bile obtained at operation from patients who had formed either cholesterol or mixed gall stones suggests that the liver secretes a potentially lithogenic bile in which one or more of the following abnormalities occur - increased cholesterol, lowered phospholipid, lowered total bile acids with the tri- to dihydroxy bile acid ratio significantly lowered from a mean of 1.23/1 to 0.65/1 ($p<0.001$). Any abnormalities present in hepatic bile become accentuated after passage from hepatic duct, into gall bladder, so that the critical lecithin bile salt/ cholesterol ratio reaches a state favouring precipitation of cholesterol, given the presence of any secondary lithogenic factors such as increased calcium, protein, or biliary stasis or infection.

Details of the biochemical findings are presented and their implications discussed. A preliminary report is also made on the technique of infra red spectroscopic analysis of gall stones.

NOTES:

8. 11.30 a.m.

"EPIDEMIOLOGY OF URIC ACID STONE"

- W. D. Proudman, Adelaide,
(Visitor)

A review of 26 patients with proven uratic calculi, and their incidence related to hospital admission over a five year period, and to other renal stones.

A comparison of the epidemiology of these and 56 patients with proven gout.

NOTES:

9. 11.45 a.m.

"HCO_3 - CO_2 TURNOVER IN MAN"

- L. J. Opit, Adelaide.

Any measurements of the oxidation rates of carbon substrates, which use the production of CO_2 as the parameter of oxidation, require information about the CO_2 pool and its turnover.

The usual technique for estimating these oxidations involves the administration of C^{14} labelled substrate and collection of blood and breath to measure the substrate and product specific activity.

A technique suitable for these measurements in man is presented and the models of CO_2 - HCO_3 pool system are discussed in relation to precise measurement of rates in such a system.

NOTES:

10. 12.00 noon

"THE USE OF MICRO ANGIOGRAPHY IN RENAL INVESTIGATION'

J. P. Maddern and C. J. Schwartz.

- J. P. Maddern, Adelaide,
(Visitor)

In this experimental method, the kidneys are injected with micropaque and gelatine, x-rayed, fixed and then sliced into four millimetre sections. The sections are then micro-radiographed and either cleared or histologically examined. The method has applications in human morbid pathology and animal experiments. Current applications of this method in both renal vascular pathology and in animal experimental work will be provided.

NOTES:

11. 12.15 p.m.

"THE ISOLATED ILEAL LOOP AS A THIRD KIDNEY"

- S. C. Hopcroft, Adelaide,
(Visitor)

We began investigating the isolated loop of jejunum as a third kidney in 1962. The work has been done in several phases. First, a pilot study using nephrectomized sheep - an effort was made to keep sheep alive as long as possible using the loop as a sole means of exchange. We were not able to prolong life an appreciable amount doing this.

The second phase was to investigate the various perfusion fluids. In this study, sheep with one remaining kidney were given a large dose of urea, (15 g urea/70 lb. sheep). Various fluids were compared with a normal saline control.

An effort to improve the efficiency of the loop is being made in this phase. Two approaches are being used:

(1) To increase the blood supply of the isolated ileal loop, thus allowing an increase turnover of electrolytes and urea;

(2) To increase the blood/luminal ratio of urea, giving a greater rate of exchange than before.

Various vasodilators have been used in (1). We have used urease and nitrous acid in (2).

Our results indicate that we have in fact increased the efficiency of the loop in these ways.

The third phase of the work - applying the principles learned in phase II is now going ahead on nephrectomized sheep.

NOTES:

12. 12.30 p.m

"THE VENTILATORY EQUIVALENTS AS A MEASURE OF EFFICIENCY OF VENTILATION IN SURGICAL PATIENTS"

- V. C. Marshall, Melbourne.

The efficiency of minute ventilation in surgical patients is difficult to judge because various factors may decrease the percentage of alveolar ventilation while, at the same time, disease or injury may increase the tissue needs for gas exchange. A measure of the efficiency of ventilation is provided by the ventilatory equivalents: the volume of air ventilated for each 100 ml. of 0_2 uptake and CO_2 excretion ($V.E.o_2$ or $V.E.co_2$). The usefulness of the V.E. as an index of changing ventilation during surgical convalescence is unknown.

A group of 35 patients undergoing a variety of surgical procedures has been studied for ten to fourteen days consecutively, with hourly measurements of 0_2 uptake, $C0_2$ production and minute ventilation during the waking day. In certain patients, changes in minute ventilation throughout convalescence corresponded to the tissue needs for gas exchange and $V.E.o_2$ and $V.E.co_2$ therefore did not change. Over half the patients showed a fall of 0_2 consumption and $C0_2$ production on the day of surgery, total ventilation falling to a lesser degree, so that $V.E.o_2$ and $V.E.co_2$ increased, the latter being the more sensitive index. This evidence of decreased efficiency of ventilation after surgery may persist for several days, even in patients with no clinical evidence of pulmonary pathology. As activity and a normal diet were resumed, a return to normal values occurred.

This study emphasizes the postoperative variability in the tissue needs for gas exchange, and in the ventilatory response to these needs. The use of ventilatory equivalents provides a sensitive index of the efficiency with which the demands for gas exchange are met during convalescence.

NOTES:

13. 1.45 p.m.

"THE EFFECT OF CYTOTOXIC DRUGS ON BLOOD VOLUME"

T. S. Reeve, P. C. Vincent, Nea Brittle, and Annette Nicholls.

To be delivered by
- T. S. Reeve, Sydney.

Deleterious effects on the body as a whole are well known complication of therapy with cytotoxic drugs. Anaemia of any significance has been said to be uncommon, and if it occurs, to be delayed and of moderate degree. We have found however that significant anaemia requiring transfusion may occur after the patients have had large doses of cyclophosphamide.

This observation has prompted an evaluation of the effects of anti-cancer drugs on blood volume in the experimental animal, with particular reference to the red cell mass. Such an evaluation becomes even more important when it is considered that the use of these drugs at the time of surgery is becoming more frequent and further that the mean blood volume of patients with malignant disease is significantly below normal.

Animals were divided into four groups and were given HN_2 (1.5 mg/Kg), cyclophosphamide (120 mg/Kg), amethopterin (1.5 mg/Kg), or Mitomycin C (1 mg/Kg) by intraperitoneal injection. Control and starved animals were given intraperitoneal saline. After 7 days, (and in the case of HN_2 and starved animals, 4 days), each animal was reweighed and its blood volume determined using Cr^{51} labelled homologous erythrocytes. Haematocrits were determined by a micromethod using a Clay-Adams Centrifuge.

Nitrogen mustard caused a fall in total blood volume observed at 4 and still present at 7 days. This change was not different from starved animals. Cyclophosphamide and methotrexate treated animals had a slightly lowered blood volume but the Mitomycin C group were unchanged.

Red cell volume was decreased after HN_2 but was not evident until 7 days, and cyclophosphamide caused a striking decrease of red cell volume. Methotrexate caused a slight but significant depression of red cell volume as compared with controls and Mitomycin C had no effect.

13. (Contd.)

In the cases of HN_2, methotrexate and starvation decreased red cell volumes were notes in the presence of high haemoglobin and haematocrit values, due to a relatively greater decrease in total blood volumes. The finding of such values should not make the observer forget the possibility of a low red cell volume masked by hypovolaemia.

NOTES:

14. 2.00 p.m.

"EXPERIMENTAL ATTEMPTS TO REVERSE THE ARTERIO-VENOUS CIRCULATION"

- P. Ryan, Melbourne.
(Visitor)

In occlusive arterial disease in the limbs, the veins are normal. It seems theoretically possible to get arterial blood to the capillary bed via these veins, though the return of blood along diseased arteries may be inadequate. At least, in a normal dog, experiments have so far shown that transanastomosis of femoral artery and vein produces a pulsatile arterial blood flow in the vein to below the knee, unresisted by the valves; and that temporary occlusion of all thigh vessels other than those transanastomosed at once changes the colour of the blood flowing upwards in the femoral artery from red to blue. Further work is in progress.

NOTES:

15. 2.15 p.m.

"THE NORMAL FUNCTION OF THE VEINS OF THE LOWER LIMB"

- J. Ludbrook, Sydney.

When a person stands, some 700 ml. of additional blood enters the lower limbs. This volume of blood is theoretically susceptible to regulation both by alteration in venous tone and by the muscle pumps of the leg and thigh. Some work on the relative and absolute importance of these two mechanisms is presented. In normal existence the muscle pumps appear the more important, both in regard to lower limb blood volume regulation and as part of man's adaptation to the erect posture.

NOTES:

16. 2.30 p.m.

"FLUID SHIFT IN A THREE-COMPARTMENT SYSTEM"

- K. R. Cox, Melbourne.

Continuous monitoring of drug leakage during regional perfusion has been attempted by detection of systemic radioactivity after addition of auotologous red cells tagged with ^{51}Cr to the perfusion circuit. This situation, for which we require a mathematical description, concerns three volumes, of which only two are known. The blood volume is known by prior dilution measurement using tagged red cells. The priming volume of the perfusion circuit is also known, but the total perfusion circuit will include the limb whose intravascular volume is unknown.

The gain in counts in the systemic circuit follows an inverse exponential curve covered by the description $y = y_{\infty}(1-e^{-kt})$ assuming that the rate of transfer, k, is constant. The transfer rate can be determined from the slope of the first part of the mixing curve to predict the percentage of leakage at time t.

Simultaneous intermittent sampling has been used as a check on accuracy of the technique and to trace the recovery of all added counts.

NOTES:

17. 2.45 p.m.

"VASCULAR TRANSPLANTS AND MITRAL VALVE REPLACEMENT"

- J. S. Wright, Sydney,
(Visitor)

This study has been concerned with the possibility of total mitral valve replacement. Structurally perfect tricuspid prostheses rendered sterile, and perhaps non-antigenic, by ethylene dioxide gas have been employed.

Both homologous and heterologous pulmonary and aortic valves have been transplanted into the area of the mitral "ring" in experimental animals and cadaveric human hearts. Several methods of implantation have been employed and results have confirmed the practicability of these procedures. Haemodynamically normal valve function has been obtained.

Concurrent studies have been performed to explore the effects of ethylene dioxide gas on the physical properties and behaviour of arterial segments, both homologous and heterologous, implanted into the aorta of animals.

NOTES:

18. 3.00 p.m.

"ANOXIA AND COLD - EFFECTS ON CARDIAC MUSCLE EXPERIMENTAL STUDIES APPLIED TO CARDIOPULMONARY BY-PASS"

- V. Hercus, Sydney.
(Visitor)

Intra-cardiac surgery has now reached a stage where the repair of both simple and complicated defects involving the septa and outflow tracts can be performed with minimal mortality.

Aortic valve replacement with a homograft and multiple valve replacements necessitate more complex and longer-than-usual cardiopulmonary by-pass. During such a performance, it is tempting to utilise whole body moderate hypothermia (17-27^{o}C) and the enthusiastic application of sludge packed around the inactive heart. The coronary circulation must always be interrupted for varying periods of time during such procedures.

It will be shown that, in isolated strips of the rat ventricle, mechanical response to electrical stimulation is proportional to the intracellular cation content, and that lack of oxygen causes a rapid exchange of cations between the extra and intracellular compartments, together with a diminution in contractile response. When oxygen is re-introduced, the muscle constituents and its performance recover, but never completely. The muscle will inevitably fail much sooner than one not subjected to any hypoxic episode. Similarly, the effect of temperature will be discussed and a point of view presented in relation to the use of "sludge" during cardiac surgery.

The clinical significance of these problems will be referred to in relation to representative cases.

NOTES:

19. 3.30 p.m.

"THE USE OF HEATED THERMISTORS IN THE MEASUREMENT OF TISSUE BLOOD FLOW"

- G. M. Davidson, Sydney.
(Visitor)

The heated thermistor technique requires the measurement of the change in heat flow produced by momentary occlusion of the arterial inflow, in the normal state and when a small amount of heat is added. The theoretical basis of this method, which gives a quantitative estimation of local tissue blood flow, will be described, as well as some of the difficulties and disadvantages encountered in using this method to determine muscle blood flow during anaesthesia.

NOTES:

20. 3.45 p.m.

"EVALUATION OF A STABLE HYPOCHLORITE ("MILTON") AS A WOUND IRRIGANT"

P. C. Vincent, T. S. Reeve, and Annette Nicholls,

- To be delivered by
T. S. Reeve, Sydney.

The value of hypochlorite solutions for wound irrigation during cancer surgery has been well documented, in experimental animals, by Cole and his colleagues. Although the solutions used in these studies effectively reduced the incidence of tumour takes, they were difficult to prepare and were unstable. Availability of a stable hypochlorite solution ("Milton") prompted its evaluation in terms of effectiveness in an animal tumour system, and in terms of any adverse effects on surgical wounds in clinical use.

The solution was studied in mice inoculated with large doses of the Ehrlich ascites tumour (10^7 cells per mouse), by 3 methods. Preliminary studies indicated that a total hypochlorite dose of 0.7 mg. per mouse was non-toxic, although doses of 1.4 mg. per mouse or greater were associated with a mortality, increasing with dose.

In the first study, mice were inoculated IP with 10^7 tumour cells immediately following an IP injection of "Milton" solution. Total hypochlorite doses of 0.7 or 1.4 mg. produced highly significant and approximately equal delay in tumour onset and prolongation of survival when compared with control animals. No significant differences between these 2 doses could be demonstrated, and for either given total amount of hypochlorite, no difference could be detected between different combinations of concentration and volume.

In the second study, tumour cells were incubated with "Milton" in vitro for 1 hour at dilutions ranging from 1:2 to 1:16. Dilutions of 1:2 and 1:4 completely destroyed the cells, as judged by their failure to produce tumours in the 63 days of their subsequent inoculation into mice. Dilutions of 1:8 or 1:16 produced significant delay in tumour onset, and prolongation of survival.

In the third group, mice were submitted to laparotomy 30 minutes after contamination of the peritoneal cavity by the instillation of 10^7 tumour cells. At laparotomy, the wounds were irrigated with either 5 ml. of "Milton" solution (1:4 or 1:8) or with 5 ml. of

20. (Contd.)

hypertonic or isotonic saline. Tumour onset was significantly delayed in the "Milton" irrigated group.

Commercially available "Milton" contains 1% sodium hypochlorite, and 16.5% NaCl. Dilutions less than 1:8 are thus hypotonic, and in each experiment controls treated with equivalent hypotonic saline have been included.

Effects due to hypertoxicity were manifest only in the in vitro system and were far less than effects from equivalent dilutions of "Milton".

Clinical experience has continued the freedom from local wound toxicity previously repeated by others. The final clinical assessme: of this solution as a wound irrigant in cancer surgery must wait, but its continued use in this field can be recommended.

NOTES:

21. 4.00 p.m.

"LOW TEMPERATURE STERILISATION OF LINEN DRESSINGS AND INSTRUMENTS BY DRY HEAT"

- N. J. Bonnin, Adelaide.
(Visitor)

The origin of the custom of using a temperature of 160°C. for dry heat sterilisation is not known. An oven working at 120°C. has been in use for twelve years and can be relied on to kill bacterial spore in six hours.

Thermal death point of spores at temperatures between 110 to 160°C. has been determined by Dr. K. Anderson.

Rates of passage of heat into various surgical bundles at temperatures below 160°C. is under investigation by the University Engineering Department.

For purposes where not more than 1 to 3 loads per day are required (e.g. doctors' consulting rooms) a low temperature oven effects reliable sterilisation, and is suitable for all materials except plastics.

A sterilising oven fitted with automatic control will be demonstrated.

NOTES:

22. 4.15 p.m.

"THYROXINE AND PROTEIN SYNTHESIS"

- J. S. Charnock. Adelaide.
(Visitor)

Defects in thyroid function in man and animals result in profound changes in growth and protein metabolism.

Recently Tata has suggested that changed thyroid hormone status in experimental animals is reflected by changed animo-acid in vitro, and that this effect preceeds the well known metabolic effects of this hormone.

Experimental evidence will be presented demonstrating that the apparent effects of thyroxine on protein synthesis in vitro can be explained by alteration in the ionic environment rather than direct physiological action of the hormone.

NOTES:

PRESIDENT

Assoc. Professor G. W. Milton

VICE-PRESIDENT

Assoc. Professor G. D. Tracy

SECRETARY/TREASURER

Mr. K. R. Cox

COMMITTEE

Mr. J. Ludbrook
Assoc. Professor T. Reeve

LOCAL SECRETARY

Mr. R. C. Bennett

MEMBERS

Senior Members	Date of Birth
Professor M. R. Ewing	16.7.1912
Professor R. Jepson	15.2.1918
Professor C. Lewis	5.1.1916
Professor J. Loewenthal	22.12.1914
Professor F. Rundle	
Mr. F. Douglas Stephens	10.10.1913
Professor N. Sutton	
Corresponding Member	
Professor G. Yeoh	22.6.1918
Members	
Mr. E. A. Allcock	12.6.1919
Mr. R. C. Bennett	
Mr. J. Borrie	
Mr. J. Brockis	
Professor W. Burnett	
Mr. K. R. Cox	17.3.1927
Professor H. Dudley	1.7.1925
Mr. R. Fowler	7.5.1928
Professor G. Fraenkel	
Mr. J. P. Halliday	19.4.1926
Mr. J. D. Harris	
Assoc. Prof. J. B. Johnston	
Mr. D. Leaming	
Mr. R. Lowe	21.12.1922
Mr. J. Ludbrook	
Mr. D. Mackenzie	
Mr. V. C. Marshall	16.8.1931
Assoc. Prof. G. W. Milton	5.3.1924
Mr. R. M. Mitchell	
Assoc. Prof. G. F. Murnaghan	
Mr. N. Nisbet	
Mr. L. Opit	
Assoc. Prof. T. Reeve	
Assoc. Prof. F. O. Stephens	
Mr. G. Stirling	20.12.1927
Assoc. Prof. G. D. Tracy	
Mr. A. Vivian	