FIRST SCIENTIFIC MEETING
of the
SURGICAL RESEARCH SOCIETY
of
AUSTRALASIA.

Surgery Department,
University of Otago.

January 29th,
1962.
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PROGRAMME

8.45 a.m. REGISTRATION (Physiology Small Lecture Theatre)

9.00 a.m. PAPERS

'The effect of ultra-violet light on wound healing'
- J.G. Brockie (Perth)
  (presented by C.W.D. Lewis)

'Heterologous transplantation of human tumours'
- Ian Russell (Melbourne)

'Renal transplantation'
- R.M. Mitchell (Brisbane)

'Carbohydrate metabolism in human skin grafts'
- L.J. Opit
  J.P. Savage (Adelaide)

10.20 a.m.- TEA
10.40 a.m.  PAPERS

'The use of intrasosseous phlebography in the investigation of the post-phlebitic syndrome'
  - J.P. Halliday (Sydney)

'Studies in gastric pepsin'
  - R.P. Jepson (Adelaide)

'Experimental laceration and repair of the liver'
  - Douglas Mackenzie (Sydney)

'The use of regional heparinisation in haemodialysis by the artificial kidney'
  - J. Nayman (Melbourne)

12.00-2.00 p.m. DEMONSTRATIONS (Physiology Practical Classroom)

12.30 p.m. BUFFET LUNCH (Staff Common Room, Dunedin Hospital)

2.00 p.m. PAPERS

'The mechanism of relapse after sympathectomy'
  - G.D. Tracy (Sydney)

'Factors in the etiology of cleft palate:
  Part 1: Genetic and environmental investigations in the human series including chromosome examinations
  - L.J. Roy (Christchurch)

  Part 2: The importance of causal mechanisms in the study of the pathogenesis of cleft palate'
  - D. Postillo (Christchurch)

'Active transport in rat liver mitochondria'
  - L.J. Opit (Adelaide)

3.20-3.40 p.m. TEA
3.40 p.m.  PAPERS

'Profound hypothermia with prolonged circulatory arrest: experimental observations'
   J.E. Johnston (Sydney)

'The effects of portal hypertension in the experimental animal'
   E.A. Allcock (Melbourne)

'The experimental induction of mega-ureter'
   G.F. Murnaghan (Sydney)

'Donor and host contribution to splenomegaly in homologous mouse chimaeras'
   I.M. Zeiss (Dunedin)
   M. Fox

5.00 p.m.  ANNUAL GENERAL MEETING

7.00 p.m.  INFORMAL DINNER AT 'LA SCALA' RESTAURANT
ABSTRACTS OF PAPERS

'The effect of ultra-violet light on wound healing' ... J.G. Brockis

See later.

'Heterologous transplantation of human tumours' ... Ian Russell

The ability of human tumours to survive as heterologous transplants in the anterior chamber of the guinea-pig eye has been studied. None of the tumours tested satisfies the criteria of successful transplantation adopted by the author. In keeping with other writers, Greene's work could not be confirmed. The value of transplantation as an aid in the assessment of prognosis is discussed.

'Renal transplantation' ... R. M. Mitchell

The cytotoxic drug V.L.B. "Velbe" and total body irradiation have both proved unsuccessful in preventing renal homograft rejection in sheep. Although a graft can be maintained in a viable condition without a cellular rejection pattern, such a graft becomes anuric in the same period as in untreated hosts. The mechanism of anuria will be discussed and the role of the electron microscope in studying this problem will also be considered.

'Carbohydrate metabolism in human skin grafts' ... L. J. Opit and J. P. Savage

A study of glycogen storage and synthesis in human (Thiersch) grafts has been made to evaluate the role of this carbohydrate as a metabolic pool in stored human skin.

A mean skin glycogen of 19 mg/100 g. wet weight was found in fresh Thiersch graft specimens. During 8 hours incubation this fell to about 40% of the initial value.

Incorporation of radioactivity into glycogen from C14 glucose or lactate was slow, suggesting little role for glycogen as a metabolic pool in skin.
The technique of intrasosseous phlebography has been adapted specifically to demonstrate the size and location of the ankle and calf perforating veins. Forty-five patients have been subjected to this procedure. The incompetent perforating veins can be seen readily in patients with the post-phlebitic syndrome, but in a normal limb or in a limb with superficial varicose veins, competent perforating veins are very small. A great difference was seen between the relatively small superficial veins in a normal limb and the grossly dilated abnormal veins. Numerous valves are visible in the deep veins of a normal limb, but these are not found in the veins of a limb affected by a deep venous thrombosis in the past.

Studies in gastric pepsin . . . R. P. Jepson

The purpose of gastric secretion is to activate pepsin activity and although the former has been extensively investigated in normal and abnormal stomachs, information on pepsin secretion is scanty. In an effort to study the latter, use has been made of Hunt's pectin meal; using a meal of known volume, consistency and temperature complete stomach aspiration was performed at 30 minutes.

The following parameters of gastric contents have been measured in fasting and "30 minute" juice: volume, amount of dye remaining, free and total acid, pH and pepsin. Distribution of these in normals and patients with gastric and duodenal ulcer is presented.

Experimental laceration and repair of the liver . . .

Douglas Mackenzie (Sydney)
'The use of regional heparinization in haemodialysis by the artificial kidney'. . . J. Nayman

Bleeding is no longer a contraindication to haemodialysis when only the region of the extracorporeal circuit is heparinized.

A technique for the simultaneous infusion of heparin and protamine sulphate by means of a synchronous double infusion pump has been evolved.

A method of monitoring and controlling this process is described.

'Mechanism of relapse after sympathectomy'. . . G. D. Tracy

Relapse following sympathetic denervation for vascular disorders has been variously attributed to natural recovery of vascular tone, supersensitivity of denervated vessels, regeneration of sympathetic nerves and incomplete denervation.

These theories are discussed, and evidence on the role of incomplete denervation is offered on the basis of experimental observations in unanaesthetised dogs in whom sympathetic denervation has been carried out.

Clinical evidence is also put forward to illustrate the significance of incomplete denervation.

'Factors in the etiology of cleft palate'

Part 1. 'Genetic and environmental investigations in the human series including chromosome examinations'. . . L. J. Roy

Cleft palate occurs once in about 650 live births, and in girls more frequently than boys in the ratio of 60/40. Direct genetic factors account for only 20 to 25 per cent, and environmental factors account for the remaining 75 to 80 per cent.

A questionnaire is being circulated to all parents of cleft palate children to collect information on events in early pregnancy.

Chromosomes are being examined in those families with a genetic history.
Part 2. 'The importance of causal mechanisms in the study of the pathogenesis of cleft palate...'

D. Foswillo

The principle of "knowledge of etiology precedes planned prevention" is discussed with relation to the pathogenesis of clefts of the posterior palate. The properties of the reacting system are studied in normal embryos, the potential causal mechanisms of malformation are postulated, and by an examination of the sequence of malformation in embryos under the influence of different teratogens, the relationship of these mechanisms to the ultimate deformity is discussed. This method may provide a basis for relating animal studies to known human malformations of the palate.

Active transport in rat liver mitochondria... L. J. Opit

The role of K ions in stimulating oxygen uptake in tissues or homogenates has been long recognised. A study in the effect of Na and K ions on respiration and phosphorylation in rat liver mitochondria has been undertaken, since these organelles are the principal site of biological oxidation and ATP synthesis in the animal cell.

No stimulation in either respiration or phosphorylation could be found with Na or K. The ability of mitochondria to bind K during active metabolism has also been studied under a variety of conditions.

Profound hypothermia with prolonged circulatory arrest: experimental observations... J. B. Johnston

The object of these experiments was to find a technique which would allow extension of time limit for circulatory arrest when using profound hypothermia.

It became apparent that three separate factors were important in determining survival:

(a) The effects of hypothermia
(b) The effect of stagnation of the circulation
(c) The availability of oxygen

An experiment was devised in which it was possible to assess each of these factors separately. The survival rate differed significantly in the 3 groups.
The effects of portal hypertension in the experimental animal... E. A. Allicock

Portal hypertension has been produced by anastomosis of the hepatic end of the divided portal vein to the aorta, either directly or by means of a vein graft. An Eck fistula has been fashioned at the same time. The results of this operation are compared with those of a simple Eck fistula.

The experimental induction of mega-ureter... G. F. Murnaghan

Perfusion and histological studies of excised segments of ureter have shown that the propulsive mechanism of the ureter is associated with a normal variation in muscular structure along its length.

In idiopathic mega-ureter it was found that the dilatation of the collecting system was associated with retrograde ureteric contractions without organic obstruction but with a predominance of circular muscle fibres in the ureteric wall.

By implanting different levels of dog-ureter into the colon it has been found possible to induce ureteric dilatation with retrograde ureteric peristalsis and a redistribution of muscle fibres in a circular direction so that the clinical criteria for a clinical diagnosis of mega-ureter have been experimentally fulfilled.

Donor and host contribution to sclerosis in homologous mouse chimaeras... T. H. Zeiss and M. Fox

Two main points emerge from the study:-

(1) As it deals with specimens in which a graft-versus-host-reaction is in progress the mitotic hyperactivity of donor cells at day seven may be interpreted as part of their immunological reaction against the host.

(2) Although the host was considered to be "immunologically immature", and was in fact unable to destroy the foreign cells, the mitotic rate of host spleen cells was abnormally high.

This excess proliferation of host cells could be ascribed to an immunological reaction only if recent reports on successful immunisation of new
born mice against homologous antigens could be further substantiated, and if it could be shown that "immunological tolerance" is essentially an "immune paralysis".

'The effect of ultra-violet light on wound healing' ... J.G.Brockia

The effect of ultra-violet light in the rate of healing in wounds in mice has been investigated.

An erythema dose of ultra-violet light applied locally to wounds increases the healing time. In the presence of infection ultra-violet light causes a temporary decrease in the bacterial flora, but this is accompanied by increased tissue destruction, and the overall effect is delayed wound healing.
DEMONSTRATIONS

1. 'Studies in lung excision and re-implantation'
   J. BORRIE (Surgery Department)

2. 'The effect of rheumatoid serum on body weight, wound strength and new tissue production in young rats'
   T.C. HIGHTON (Medicine Department and M.R.C.)

3. 'A necropsy study of the carotico-vertebro-cerebral vasculature in cases with brain infarction'
   R. RODDA and L. DUGDALE (Pathology and Radiology Depts.)

4. 'Problems of immunological tolerance and homologous chimerism'
4a. 'Studies on transference of bone'
   N. W. NISBET, B. H. HESLOP and I. W. ZEISS (Surgery Department)

5. 'A study of coconut eating Polynesians'
   J. D. HUNTER (Medicine Department)

6. 'Cytological diagnosis of prostatic cancer'
   N. W. FITZGERALD (Microbiology Dept)

7. 'A test system for scolicidal agents'
   J. H. HESLOP (Surgery Department)

8. 'Investigation of the aetiology of thyrotoxicosis'
   D. D. ADAMS (Endocrinology Research and M.R.C.)

9. 'Electron microscopy of the kidney'
   F. O. SIMPSON (Medicine Department and M.R.C.)

10. 'Dangers of electric cardiac defibrillation'
    A. M. CLARKE (Surgery Department)
11. 'Vertebral arteriography'
   L. DUGDALE (Radiology Department)

12. 'Studies on the arterial pulse in man'
   E. R. NYE (Medicine Department and
   M. R. C.)

13. 'Pathological physiology in varicose veins'
13a. 'A method of blood flow measurement'
   J. LUDBROOK (Surgery Department)