Abstracts of Proceedings

13th March, 1951

Annual Meeting

The Annual Meeting was held in the Society's Room, Tasmanian Museum. Mr. A. L. Meston, Vice-President, presided.

The following Office-bearers were elected for 1951:—Mr. J. W. C. Wyett was elected Vice-President in the place of Mr. A. L. Meston, who retired under Rule 12; Honorary Secretary, Dr. J. Pearson; Assistant Honorary Secretary, Mr. D. Martin; Honorary Treasurer, Mr. S. Angel; Honorary Auditor, Mr. A. M. Hewer.

The following were elected members of the Council for 1951: Mr. A. L. Meston and Mr. L. W. Miller were elected for three years in the place of Mr. J. W. C. Wyett and Mr. D. Martin who retired under Rule 21.

The following were elected members of the Society:—Miss P. H. Perkins, Mrs. Lucy Fletcher, Miss G. Whitfield, Mr. J. C. Murray, Mr. H. G. Pitt.

Mr. I. G. Anderson presented to the Society, on behalf of Mr. W. Gellie, a bound typescript containing the names of the settlers who arrived in Van Diemen's Land between the years 1804 and 1835. Dr. Crowther, who was absent owing to illness, sent a letter to the Chairman in which he referred to the typescript. The gift was accepted by the Chairman on behalf of the Society and the Secretary was instructed to send a letter of thanks from the Society to Mr. Gellie.

Mr. L. W. Miller delivered a lecture entitled " Post-war Development in Pest Control " of which the following is an abstract:—

> Since the second World War there has been a striking increase in the numbers of new insecticides. These new materials are all organic chemicals and have largely replaced the inorganic chemicals formerly used as insecticides.
>
> The most used of the new chlorinated compounds is DDT. Others coming into prominence in Australia are benzene hexachloride and chlordane.
>
> The other major group of new insecticides are the organo-phosphorous compounds such as H.E.T.P., T.E.P.P. and Parathion. More recently there have been developed the compounds within this group that show systematic properties.
>
> The implications of all these new insecticides on economic entomology were touched on.

3rd April, 1951

A meeting was held in the Society's Room. Professor S. W. Carey, Vice-President, presided.

The following were elected members of the Society:—Mr. D. H. Borchardt, Mr. B. J. Dempsey, Mr. R. J. Ford, Mr. J. L. Hickman, and Mr. H. J. Turner.

Dr. J. B. Polya delivered an illustrated lecture entitled " Chemo-Therapy of Cancer " of which the following is an abstract:—

> Cancer is not a single disease but a group of diseases characterized by malignant neoplasms. The criteria of malignancy are the ability to form metastases and a total or far going freedom from the control of organizers. A characteristic feature of cancer is a tendency towards the loss of special-

ization in the affected tissues. This tendency towards uniformity applies to individual cases only and the direction of this tendency varies from case to case.

Physical, chemical, biological and psychological methods, are being used in the treatment of cancer. Physical methods such as surgery and radiological techniques, are the most reliable at present. All chemical methods of treatment may not be classified as chemotherapeutic ones; nostrums have psychological effects only, "chemical surgery" is undesirable and the large number of ethical drugs used in the treatment of cancer assist the surgeon and the radiologist without striking at the root of the disease. True chemotherapeutical agents are expected to remove deficiencies, excess secretions, poisons and foreign bodies directly responsible for the disease. While chemical cures or improvement of cancer have been effected, it is not possible to claim that a certain percentage of any particular type of cancer can be cured by chemotherapy.

It is improbable that deficiencies, e.g., those of magnesium or vitamins, cause cancer and attempts to correct such deficiencies have not led to reliable cures of cancer. Low cobalt: nickel ratios are possibly correlated with the high incidence of malignant leukemias in Tasmania, but this requires further confirmation. As to dietary excesses, recommended starvation diets are more absurd than useful and it appears that the effect of diet is more pronounced on the cancerous than on the precancerous state.

Polycyclic tar hydrocarbons and azo-dyes may be used for the experimental production of cancer; some industrial cancers are due to such causes. At the same time some members of these carcinogenic classes, especially the weaker ones, may be used to inhibit tar cancer.

In the case of hormones, the notions of deficiency and excess are of little use. Much evidence on the correlation between cancer and hormonal levels (or the levels of metabolites governed by hormones) is contradictory. Tumours of the prostata may be controlled and occasionally cured by the administration of natural or synthetic oestrogens although this treatment may lead to complications. The formation of mammary cancers is delayed or inhibited by androgens which, however, cannot cure mammary cancers.

Cancer is not due to bacteria. The existence of Bittner's milk factor and the transfer of cancer through cell-free filtrates indicate that a virus may be involved but the lack of cancer epidemics and the delayed action of the virus indicate that the controlling factor in the viral production of cancer is the accommodation of the virus within living cells. Such a process would amount to a mutation if the cancer virus were assumed to act either as a supernumerary gene or as a substitute for a gene and if such an alteration of an originally normal cell were stable enough to be perpetuated through the mitotic process. The most promising methods of chemotherapy are based on this picture of a mutant cell acting as a foreign organism.

Drugs slowing down cell growth are expected to control the rapid cancerous growth. Colchicine is satisfactory from a cytological point of view but too toxic for therapeutic purposes. Some compounds related to the old colchicine structure, now recognized to be inaccurate, including synthetic substances related to stilboestrol and the chelidonium alkaloids are being studied. This work is promising but has not yet yielded significant results. Since the colchicine effect has been correlated with narcotic effects, some narcotics have been tried. Some urethanes and, to a lesser extent, benzene have some effect against leukemias but may give rise to other forms of cancer. Arsenical preparations have similar uses and dangers. Bacterial toxins have some selective effect against cancer but they are too toxic and tumours may develop immunity towards them. It is suggested that Apolant's work on eosine-selenium compounds be resumed since his early work indicates that such materials have a great selective toxicity for cancer cells.

Inhibition of nucleic acid synthesis through the competition of alpha methopterin with folic acid or 2, 6-diaminopurine with adenine and guanine has given promising preliminary results.

Mustard gas and the nitrogen mustards inhibit mitotic processes presumably through cross linkages between vital protein chains but similar effects on other proteins result in excessive general toxicity. Derivatives of ethyleneimine and ethylene oxide were expected to display antimitotic effects. Experimental work confirmed this prediction in a number of cases. Further extension of these theories has led to the investigation of some 1, 2, 4-

triazoles in Tasmania. Some compounds of the latter class have powerful antimitotic effects and 1-phenyl-3, 5-dimethyl-1, 2, 4-triazole powerfully inhibits C3H tumours of mice.

According to Potter cancer arises through the transformation of an unknown enzyme into a virus through carcinogens. Inhibition of the critical enzyme by co-carcinogens leads to a lowering of the enzyme : virus ratio to a value at which the symptoms of cancer appear. The enzyme might be succinic dehydrogenase or a closely related aerobic enzyme which is in good agreement with a number of observations, including the inhibition of cancer by methylene blue or pyocyanine.

Effective chemotherapeutic agents against cancer may be expected in the near future although it is probable that their usefulness will be restricted to particular types of cancer.

1st May, 1951

Jubilee Meeting

A meeting was held in the Society's Room. The meeting was arranged as part of the celebrations of the Jubilee of Federation. Professor S. W. Carey, Vice-President, presided.

The following were elected members of the Society:—Miss E. Cornelius, Mr. L. A. Hoare, Mrs. H. R. Evershed, Miss M. Wilson, Mr. Donald Cameron, Mr. B. R. Ellis, Mr. N. A. Findlay, Mr. John Lord, Mr. Allan T. Orr, Mrs. M. Padman.

Professor Carey, as Chairman, addressed the meeting regarding the imminent departure of His Excellency the Governor (President of the Society) and Lady Binney at the termination of his period of office as Governor of Tasmania. Professor Carey drew attention to the valuable work which both the Governor and Lady Binney had done for the community during their residence in Tasmania.

In reply His Excellency thanked Profesor Carey and the Society for giving him and Lady Binney the opportunity of saying farewell to members of the Society.

Mr. J. Reynolds delivered a lecture entitled " The Building of the Australian Federation ", of which the following is an abstract:—

It is fitting that the Royal Society of Tasmania should meet to celebrate the Jubilee of the Commonwealth of Australia. A number of the Society's members made valuable contributions to the building of the Federation:— Sir Edward Braddon, Sir Adye Douglas, Sir Neil Eliot Lewis, the Honourables Andrew Inglis Clark, Nicholas John Brown, and Charles Henry Grant were Tasmanian delegates to the Constitutional Conventions; Sir Herbert Nicholls, Messrs. Frederick William Piesse, and William Frederick Dennis Butler were leading members of the Federation League. And I am happy to see Mr. Wilfrid H. Hudspeth with us on this occasion. Mr. Hudspeth was a tower of strength to the Federalist cause as President of the Hobart Branch of the Australian Natives Association during the period of the Referendum campaigns for the adoption of the constitution.

Many and various causes operated both for, and against, the building of the Australian Federation. It is my purpose to-night to endeavour to mention one of the principal forces known to historians to-day.

Tasmania was the first colony to secure administrative independence from New South Wales. On December 3rd, 1925, the Royal Society commemorated the centenary of the separation with a dinner which was held in the old meeting room. Western Australia was founded four years later and was never subject to the Government at Sydney. In 1836, South Australia was established as a Province and not a colony, which was likewise governed by the Colonial Office. Victoria became a separate colony in 1851 and Queensland in 1859. Unfortunately when the Colonies received their grants of responsible representative government (1855-56), no provision was made in their constitutions for uniform action upon vital matters of mutual concern.

As early as 1848, the then Colonial Secretary (Earl Grey), had endeavoured, unsuccessfully, to form a federal union by an Act of the Imperial Parliament. His scheme was rejected through indifference in England, and violent opposition in all the colonies. In spite of the untiring efforts of leading Australian Statesmen, such as Sir Edward Deas-Thomson (N.S.W.), William Charles Wentworth (N.S.W.), Charles Gavan Duffy (Vic.), and George Higinbotham (Vic.), the colonists were determined to remain divided. For at least thirty years after the separation of Queensland (1860), the governing classes in England seemed by their indifference, to favour these separatist policies. "The little Englanders", the Manchester School disciples and the powerful Radicals all looked coldly upon any forward colonial policy. This situation was unchanged until Joseph Chamberlain became Colonial Secretary (1895), when the Federation Movement was well under way.

In these circumstances it is not surprising that the forces of Provincialism took command of colonial politics. The six colonies each provided themselves with practically the whole apparatus of civilised government. As these were unrelated and mostly unco-ordinated, great confusion, delay, and economic loss resulted. The greatest difficulty was the Tariff problem. Every colony at one time and another, during this period, raised customs barriers against its neighbours. In spite of the amazing number of conferences which were held to try and reach agreement, Federation in 1901 found them still squabbling. Matters were little better in respect to Postal Administration, Quarantine, Marine Regulations, Immigration and Legal Processes. The defence position was almost Gilbertian, there being at one period six little armies having different commands, arms, and uniforms. Naval defence after 1888 was slightly better as the Australian colonies and New Zealand were in that year brought into a general Imperial defence scheme. There had been some united action in support of Queensland's occupation of New Guinea (1881-82) to forestall Germany, but even encroachments of foreign powers, and Russia War scares (1885-90) failed to awaken the provincially minded politicians.

I am putting forward the theory this evening that it was the awakening and pressure of an Australian Nationalist public opinion that defeated the forces of Provincialism and made Federation possible. I feel that there is much evidence in support of this theory. The foundation (1871) and rapid growth in power and influence of the 'Nationalist' Australian Natives Association was something new to the colonies. Its members, native born Australians, were untiring missionaries for the idea of a Nation, rather than six squabbling colonies. In 1880, the Sydney Bulletin appeared. This journal soon achieved an importance out of all proportion to its circulation because it made Australian Nationalism and self-reliance its unshakable policy. It encouraged Australian writers, poets and artists on a scale hitherto unknown in journalism.

Sir Henry Parkes (the Father of Australian Federation) took up the cause of Union at a very early stage of his long political career. Between the years of 1860 and 1880, when the ridiculous tariff wars were at their height he used every opportunity to preach the federal gospel. His idea of a Federal Council was finally adopted and met for the first time in Hobart in 1886. It was too limited and powerless for his purposes. In 1889, Sir Henry saw his opportunity, and at Tenterfield (N.S.W.), made an historic appeal to the Australian people to unite and become a nation. This speech was the starting point of the Federation Movement. As I view this movement, I see it sweeping aside all the Provincial, sectional and local interests and carrying public opinion with it towards a national ideal. I claim that it was the existence of a national sentiment which made this possible.

The leaders of the movement adopted national phrases in making their appeal for support. Sir Henry Parkes coined the phrase, "One People, One Flag, One Destiny" (this was adopted as the motto of the Federation Leagues).

His successor in leadership, Sir Edmund Barton, was the author of the oft-repeated prophecy; that when Federation was achieved, "That, for the first time in history, there will be a nation for a continent, and a continent for a nation". And Alfred Deakin enthusiastically described his countrymen as "Independent Austral-Britons". Many other phrases and slogans could be quoted if time permitted. The Tasmanian, Andrew Inglis Clark, told the 1890 Federation Conference that he looked toward a "United Australia which will progress and flourish, and take its place among the nations of the world.

I have not discovered any other force which could be compared with Nationalism, as a means of achieving a national union of the colonies, whether by way of federation, confederation, or unification.

At the conclusion of this meeting the Council entertained His Excellency the Governor and Lady Binney to coffee and light refreshments in the Art Gallery. There were about 40 people present.

5th June, 1951

A meeting was held in the Society's Room. Mr. J. W. C. Wyett, Vice-President, presided.

The following were elected members of the Society:—Mr. A. M. Kilgour, Mr. J. B. Taylor, Mr. C. I. Wood, Mr. C. Pease.

Professor S. W. Carey delivered an illustrated lecture entitled "Industrial Power from Volcanoes".

3rd July, 1951

A meeting was held in the Society's Room. Professor S. W. Carey, Vice-President, presided.

The following were elected members of the Society:—Mr. R. S. Ellis, Mrs. J. H. Thyne, Mr. T. E. Burns, Mr. N. Hawkins.

Professor G. G. Firth delivered a lecture entitled: "Problems of Economic Research", of which the following is an abstract:—

A. Borderline Problems

Four main fields of economic research—

(1) Analysis of money flows and asset stocks in an economy.
(2) Behaviour of private economic units (households and business firms) in relation to market activities.
(3) Policies of governments and associated authorities (including central banks) in spending and taxing, altering the supply of assets and regulating the conditions of production and exchange.
(4) Measurement of "wealth and progress" in particular regions.

Of these fields (1) involves the co-operation of accountants; (2) that of psychologists, social anthropologists, production engineers and agricultural scientists; (3) that of political scientists; whilst (4) raises the profound philosophical difficulties associated with the measurement of "well-offness".

A research economist should have some knowledge of borderline problems in these fields and should be aware of the need to consult appropriate specialists when designing or interpreting his research.

B. Methods of Research

Impossibility of controlled experiment results in economists having to rely upon empirical correlations established by time series analysis. Relationships thus established are liable to change in the course of time. More frequent collection of data is desirable but expensive. The economist's problems here resemble those of the meteorologists.

Statistics are often collected as a by-product of administrative or commercial requirements. The research economist must be sceptical of published statistics and aware of their shortcomings. Random sampling techniques for collecting data have two main disadvantages: the absolute size of the sample must be fairly large, and the difficulty of avoiding "response bias".

Kinds of mathematics appropriate to economic research are only now being developed and are accessible to comparatively few economists.

C. Problems of Measurement

Quantitative economic studies often involve the use of aggregate values, involving a price component as well as a quantity component. To allow for changes in the value of money, aggregate values must be " deflated " by price index numbers. Unfortunately, the process of deflation involves a comparatively wide margin of error during times of acute monetary disturbance; yet these periods are of special importance for economic research.

The measurement of " welfare " between places and periods raises deeper philosophical problems, for the solution of which economic research can do little more than supply better and more plentiful information, as the basis for the normative judgments on which measurement of this kind ultimately depends.

D. Research Manpower

Review of the financial and other difficulties which at present make it almost impossible for State universities to attract research workers in economics who possess the necessary qualifications for effective original work.

7th August, 1951

A meeting was held in the Society's Room. Professor S. W. Carey, Vice-President, presided.

The following were elected members of the Society:—Mrs. V. E. Vimpany, Mr. T. R. Lorimer, Mr. S. L. Rennison, Mr. A. Weatherley, Commander F. D. Shaw, Mr. L. E. Wall, Mr. M. L. Yaxley.

Dr. Pearson explained that Lady Shoobridge had telephoned to him to the effect that fossilised trees had been uncovered during working operations on the road between Glenora and Gretna. Professor Carey had been immediately informed of this and members of the Geology Department at the University went out and examined the trees and took photographs. Specimens of the trees were exhibited at the meeting and Mr. M. R. Banks, Lecturer in Geology at the University, gave some notes of explanation. Sir Rupert Shoobridge also spoke.

Dr. A. G. Nicholls delivered a lecture entitled " Age and Growth of Trout from their Scales " of which the following is an abstract:—

The general structure and development of trout scales was described, and their relation to the growth of the fish explained. It was shown that summer and winter ring-formation is related to the food intake of the fish and not to temperature itself; this is only the indirect cause of variation in growth rate since the natural food supply depends on seasonal fluctuations.

Trout from the Lakes of Tasmania, where growth is good, show an anomaly in structure, in that the winter ring corresponding to the second year of the fish's life may be omitted. It is probable that the second ring laid down on the scale may correspond with the first occasion on which the fish spawns, usually the third year of life, as has been found elsewhere in Rainbow Trout.

27th August, 1951

A meeting was held in the Society's Room. Mr. J. W. C. Wyett, Vice-President, presided.

Mr. W. H. Hudspeth moved that " The meeting had learned, with deep regret, of the death of its former President, Sir Ernest Clark, G.C.M.G., K.C.B., C.B.E., and wishes to place on record its appreciation of his services to the Society ". In moving this resolution, Mr. Hudspeth spoke of the great interest which Sir Ernest had shown in the Society's business and mentioned that he actually presided at 70 meetings during his term of office from 1933 to 1945.

The following were elected members of the Society:—Mr. R. C. Robertson. Hon. Member, Mr. W. E. Masters. On the recommendation of the Council Mr. W. E. Masters, B.A., LL.B., had been nominated for Honorary Membership of the Society at the last meeting. In supporting the nomination Mr. W. H. Hudspeth, on behalf of the Council, had outlined the reasons for which this proposal was being made and referred particularly to the valuable work which Mr. Masters had carried out over a period of years on the historical researches connected with the Hobart waterfront and with other aspects of early history.

Professor Ralph Grim, Research Professor of Geology, University of Illinois, U.S.A., delivered a lecture entitled: "The Composition and Properties of Clays and Soils".

27th August, 1951

A Special Meeting was held in the Society's Room at the conclusion of the General Meeting. Mr. J. W. C. Wyett, Vice-President, presided.

Dr. Pearson (Hon. Secretary) explained the reason for the meeting namely, to pass the consolidated Rules of the Society as proposed by the Council, and in moving the consolidation Dr. Pearson pointed out that there were very few alterations from the amendments which had already been passed by the Society at various special meetings and any alterations that had been made were for the purpose of clarifying rules or for abbreviating certain statements such as the schedule dealing with Medals and Awards.

2nd October, 1951

A meeting was held in the Society's Room. Professor S. W. Carey, Vice-President, presided.

The following exhibits were shown:—Self portrait of J. Glover; Picture by J. Glover purchased in London; Six coloured photographs of drawings by Tobin during Bligh's expedition to Adventure Bay in 1792.

Dr. Joseph Pearson delivered an illustrated lecture entitled "Recent Researches in Marsupial Comparative Anatomy and Embryology", of which the following is an abstract:—

> This abstract deals with some aspects of the investigations on marsupial anatomy and embryology which are being carried out at the Tasmanian Museum by the Lecturer in collaboration with Mr. de Bavay.
>
> Although in the early vertebrates the Wolffian duct and Müllerian duct arise simultaneously by the splitting of the pronephric duct, there is a considerable time-lag in the formation of the Müllerian duct in the marsupials. Buchanan and Fraser have shown in *Trichosurus* that the Wolffian duct has already opened into the cloaca before the primordium of the Müllerian duct is first recognizable. Later the Müllerian duct, following the precise course already established by the Wolffian duct, lying at first on the outside but gradually moving its relative position until in its posterior section the Müllerian duct lies medial to the Wolffian duct in close association with it.
>
> The ureters arise as outgrowths from the Wolffian ducts and in the case of the 'placental' mammals (Eutheria) take a lateral course from their point of origin while in the marsupials (Metatheria) they take up a position medial to the Wolffian duct. Thus, the Müllerian ducts, in the Eutheria, take up a medial position side by side and ultimately coalesce in the middle line to form a single median vagina lying betwen the roots of the ureters, whereas in the Metatheria they remain as two separate tubes lateral to the ureters throughout life. In females each Wolffian duct degenerates and disappears except for a mere vestige which we believe persists in the Marsupialia, as a

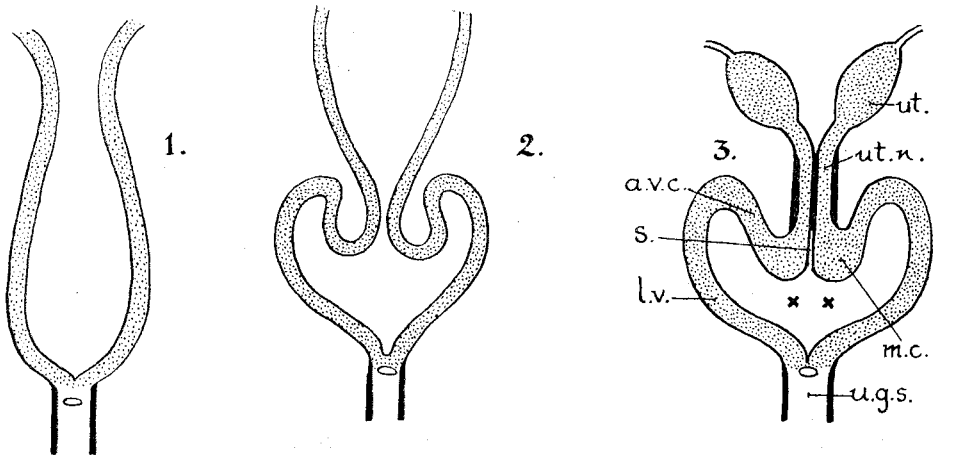

FIG. 1.—Arrangement of r. and l. Müllerian ducts in primitive mammal (hypothetical).
FIG. 2.—Embryonic arrangement of r. and l. Müllerian ducts in all marsupials.
FIG. 3.—Condition of the vaginal complex in the more primitive marsupials.
NOTE.—The two crosses indicate the level at which the two ureters enter the bladder.

a.v.c.—anterior vaginal canal
l.v.—lateral vagina
m.c.—median vaginal cul-de-sac
s.—septum between r. and l. culs-de-sac
u.g.s.—urogenital sinus
ut.—uterus
ut.n.—uterine neck

component of the posterior region of the lateral vagina in company with the Müllerian duct. In males the two Müllerian ducts usually disappear though vestiges may persist in some mammals.

The developing Müllerian ducts do not run caudally by the shortest route but follow the somewhat devious course already set by the Wolffian ducts, and are thus deflected medially until they almost meet, and then sweep outward and forward passing lateral to the ureters and then again in a caudal direction to reach the sinus.

This flexure of the Müllerian ducts (fig. 2) is characteristic of all Marsupials and the point at which the two ducts approximate most closely to each other marks the ultimate separation of each Müllerian duct into its two most important adult components, the uterus and the vagina.

Throughout the vertebrate series, with the exception of the viviparous mammals, the right and left Müllerian ducts remain distinct from each other throughout life. It may be assumed that this was also the case in the prototypal marsupials and many of the less specialized recent marsupials still retain this primitive condition (see fig. 3). However, in most marsupials the right and left Müllerian ducts communicate with each other immediately caudal to the uterine necks (figs. 4 and 5, *m.c.*). In the *Potoroidae* (Rat-Kangaroos) there is a further junction between right and left sides in the most anterior region of the vaginal complex where both anterior vaginal canals become enlarged and fuse to form a single chamber, the anterior vaginal expansion (fig. 6, *a.v.e.*).

The anterior part of the vaginal complex (anterior vaginal canal and its derivatives, including the anterior vaginal expansion) is concerned with the storage of spermatozoa received from the male during the period of oestrus. As will be seen later the lateral vaginae lose their original parturient function and become converted into spermathecae. The simplest modification is seen in the Macropodidae (fig. 5) in which the anterior portions of right and left vaginae become greatly distended during the oestrus period due to the presence of spermatozoa which have been received through the lateral vaginae. In the Potoroidae (fig. 6) the right and left enlargements (spermathecae) fuse to form the anterior vaginal expansion referred to above. This provision of a spermathecal system reaches its highest development in *Bettongia* in which the anterior vaginal expansion takes the form of a swollen anterior caecum which extends forward and lies immediately below the uteri.

This spermathecal caecum is homologous with the similar structures in *Perameles* (fig. 4, *caec.*) except that in the latter genus the right and left expansions remain separate and do not fuse, though the two separating walls lie close to each other in the middle line. Incidentally, it is worthy of note that *Perameles* is not a primitive and unspecialized marsupial as is sometimes claimed. Externally the feet show considerable specialization and the female urogenital system is specialized in the following respects:—

(1) The presence of a pair of vaginal caeca.
(2) The extreme anterior position of the openings of the ureters into the bladder.
(3) The extremely long lateral vaginae with a consequent long pseudovaginal gap.
(4) The short urogenital sinus.

The condition shown in fig. 3 may be regarded as typical of the marsupial vaginal complex and is found throughout the Didelphoidea, Caenolestoidea and the Dasyuroidea as well as in the least specialized members of the Phalangeroidea. However, occasionally it is found in these super-families that the septum (fig. 3, *s.*) between the right and left culs-de-sac breaks down, thus bringing about a junction between the right and left Müllerian ducts as described above.

The characteristic double kink of the vaginal system, shown in fig. 2, is found in the early developmental stages of all marsupials though it may be disguised in the adult condition of the more specialized type of vaginal complex (see figs. 4 and 6).

It is clear that this double kink must have made the act of parturition a very hazardous business for the prototypal marsupials (unless, as is not unlikely, the Müllerian ducts were still in the primitive phylogenetic condition shown in fig. 1). J. P. Hill has shown that this difficulty was overcome by the improvisation of a more direct passage for the purpose of parturition

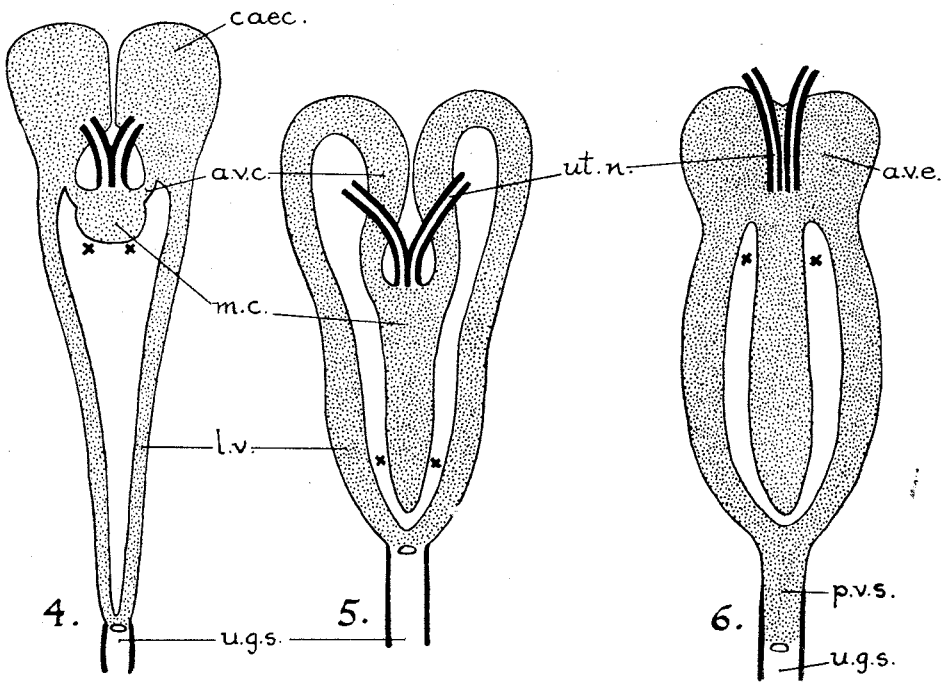

FIG. 4.—The vaginal system of *Perameles*.
FIG. 5.—The vaginal system of a Kangaroo (Macropodidae).
FIG. 6.—The vaginal system of *Potorous* (Potoroidae).
NOTE.—The uterine bodies are not shown.
a.v.e.—anterior vaginal expansion
caec.—vaginal caecum
p.v.s.—posterior vaginal sinus
(other letters as in figs. 1-3)

by way of a 'pseudovagina'. When the embryos pass from the uterus into the cul-de-sac the fluid pressure which has been set up is sufficient to force the embryo through the posterior wall of the cul-de-sac into a tract of loose connective tissue which extends caudally as far as the urogenital sinus. Probably this impetus also enables the embryos to force their way through the wall of the urogenital sinus. It may be assumed that at this crisis the epithelial walls of both culs-de-sac and sinus are subjected to hormonal action which assists the double 'break through'. In the more specialized marsupials the culs-de-sac are considerably enlarged in a caudal direction so as to reduce the pseudovaginal passage, and in extreme cases they reach the urogenital sinus (figs. 5 and 6). The climax to this extraordinary story of pseudovaginal parturition is reached in a few marsupials (some of the Macropodidae and *Tarsipes*) in which a permanent epithelial connexion is set up between the cul-de-sac and the sinus to form a permanent median vagina.

It is to be observed that this "median vagina" resembles the Eutherian vagina in three important respects.

(1) it is of Müllerian origin
(2) it is formed by the fusion of portions of the right and left Müllerian ducts
(3) it lies mesial to the ureters.

In other words, a structure has been produced in some of the more specialized Metatheria which resembles the highly efficient vagina of the Eutheria both in position and function, but which has been evolved in an entirely different way.

This is, *par excellence*, an example of convergence in which structures similar in function and in anatomical position have been produced independently

In this connexion it is necessary to point out that the '3-way vagina' so formed in a few specialized marsupials is not characteristic of the Marsupialia as a whole. Indeed the normal marsupial possesses short culs-de-sac and the presence of a functional 'median vagina' is the rare exception and not the rule. It is necessary to make this clear in order to correct the impression conveyed in some text books on this important point.

An examination is being made of embryological and adult material to determine the constitution of the posterior region of the lateral vagina about which there has been some difference of opinion. Our evidence seems to show that the lateral vagina consists of three parts

(*a*) the major portion (anterior) consisting of Müllerian duct only;
(*b*) this is followed caudally by a section which consists of both Müllerian and Wolffian elements lying side by side and both contributing to the epithelium which bounds the lumen in this region. The vestigial Wolffian duct is sometimes seen at the anterior end of this region as a short degenerate stump;
(*c*) a short posterior section formed from the sinus horn (sinus tissue).

19th November, 1951.

A meeting was held in the Society's Room. Professor S. W. Carey, Vice-President, took the chair at the beginning of the meeting.

This meeting was an important occasion as the Society welcomed its new President the Rt. Hon. Sir Ronald Cross, Bt., who had recently taken over the office of Governor of Tasmania. Professor Carey informed the meeting that the two Vice-Presidents and the Honorary Secretary waited on His Excellency on Tuesday, 28th August, to ask him whether he would agree, under Rule 11, to accept the office of President of the Society, and His Excellency acceded to this request. He therefore, had pleasure now in inviting His Excellency to take the chair as President of the Royal Society of Tasmania, and expressed the hope that members would have the pleasure of seeing our new President guiding the affairs of the Society on many occasions. His Excellency then took the chair.

The President then presented the Clive Lord Memorial Medal to Professor J. Burke, Professor of Fine Arts at the University of Melbourne, and asked him to deliver the Clive Lord Memorial Lecture entitled "The English Background of Colonial Architecture in Australia". This lecture was illustrated by lantern slides.

The following were elected members of the Society:—Mrs. F. Pryde, Miss L. I. King, Miss N. C. King, Dr. F. Ahamd, Mr. L. R. Butler, Mr. F. H. Long, Dr. K. Rodger.

The meeting then adjourned to the Zoological Room in the Museum where coffee was served.

Northern Branch

Annual Report

The Annual Meeting was held on the 30th March, 1951, Mr. J. E. Heritage presided, and the following office-bearers were elected:—

Chairman: Dr. C. Craig.
Vice-Chairman: Mr. J. E. Heritage.
Council: Messrs. G. C. McKinlay, W. Baulch, G. Crawford, W. Gellie, Rev. J. C. Jones.
Hon. Secretary and Treasurer: Miss I. Thomson.

In November, the Rev. J. C. Jones resigned and Mr. K. R. von Stieglitz was elected to the vacancy for the remainder of the term.

Meetings

During the year eight Council meetings and seven General meetings have been held. Historical Expeditions have been held to George Town and Clarendon.

Historical notes on these districts have been issued to members.

General Meetings were as follows:—

March 30th, 1951	Prof. S. W. Carey: "Industrial Power from Volcanoes".
May 5th, 1951	Mr. M. R. Banks: "Geology in the Community".
June 15th, 1951	Mr. J. B. Boniwell: "An Introduction to Geophysics".
July 13th, 1951	Messrs. J. E. Heritage, J. Curtis, W. F. Ellis, Dr. C. Craig: "The Tasmanian Aborigines".
August 31st, 1951	Mr. J. B. Thwaites: "Scenery Preservation in Tasmania".
October 16th, 1951	Prof. H. N. Barber: "The Experimental Control of Flowering".
November 30th, 1951	Dr. C. Craig: "The early History of Northern Van Diemen's Land with special reference to York Town, Launceston and George Town".

Membership

Membership of the Branch now stands at 132, showing an increase of 27 during the past year.

Donations

The Branch is indebted to many members who have helped throughout the year. Mr. K. R. Von Stieglitz has generously donated notice cards to the Society, Dr. C. Craig has presented the material he collected for his lecture " On the early settlements in the North of the Island " and Mrs. H. Stewart has given the manuscript material of the work of her late husband. Thanks are due to these and to all other donors.

The Branch offers its congratulations to Mr. K. R. von Stieglitz on being given an O.B.E., for his valuable work in the historical field.

To the Chairman, Vice-Chairman, Members of the Council and to the Press are thanks due for their continual help and co-operation in the work of the Society.

Meetings, 1951

30th March, 1951

The Annual Meeting of the Royal Society of Tasmania, Northern Branch, was held at the Museum, on Friday, the 30th March, at 8 p.m.

The Annual Report and Balance Sheet were adopted.

Mr. J. E. Heritage presided.

Under the rules the following Office-bearers were elected:—

Chairman: Dr. C. Craig.
Vice-Chairman: Mr. J. E. Heritage.
Council: Rev. J. C. Jones, Messrs. W. Baulch, G. C. McKinlay, G. H. Crawford, W. Gellie.
Hon. Secretary and Treasurer: Miss I. Thomson.

An illustrated lecture was given by Professor S. Warren Carey, Senior Vice-President of the Royal Society, on " Industrial Power from Volcanoes ".

He said that there was a moral responsibility on civilisation to harness never-ending sources of power, such as hydro, solar, wind and volcanoes, before using coal and petroleum reserves, which once used, could never be replaced.

Profesor Carey stressed that at the present rate of use there was only coal supply for 1000 years and reserve for 10 years, Volcanic power could be harnessed and the world had such a colossal reserve that there was no chance of exhaustion.

The Speaker discussed developments of this power in Italy, New Zealand and Japan, and explained the methods used.

5th May, 1951

A meeting was held at the Museum, Dr. C. Craig presiding.

Mr. M. R. Banks, lecturer in Geology at the University of Tasmania, spoke on " Geology in the Community ".

Mr. Banks said that Man, through industry, is dependent on rocks and the minerals they contain to maintain his standard of civilisation. Geologists here are already, owing to the threat of reduced exports from America,

intensifying their search for the raw materials of sulphuric acid, a basic requirement for industrial purposes.

The Persian oil crisis accentuates the need for Australia to find and develop oil fields close at hand. In this need the geologist is in the forefront of investigations.

Mr. Banks said that even in building a city the geologist can advise on the best site, best local building material and precautions against instability of the underlying rocks.

15th June, 1951

A meeting was held at the Museum, presided over by Mr. J. E. Heritage.

Mr. J. B. Boniwell was the Speaker. He took as his subject "An Introduction to Geophysics".

Mr. Boniwell explained the meaning and use of Geophysics in many undertakings, especially those concerned with oil and water prospecting today. He described instruments used in these processes and the methods employed, illustrating his talk with slides.

13th July, 1951

A meeting was held at the Museum, Dr. C. Craig presiding.

The lecture took the form of a symposium of "The Tasmanian Aborigines".

Speakers were:—

Mr. J. E. Heritage: who after a general review of the problem discussed past and current theory of the origin of the group.

Mr. W. F. Ellis: who discussed the nature and distribution of the Archaeological deposits left by the Tasmanians.

Mr. J. Curtis: who described their implements and weapons and their uses.

Dr. C. Craig: who, under the heading "Were the Tasmanians a successful race?" concluded the series with a review of their culture and its relation to environment.

31st August, 1951

A meeting was held at the Museum, Mr. F. Smithies presiding.

An illustrated lecture on "Scenery Preservation in Tasmania" was given by Mr. J. B. Thwaites, Acting Superintendent of Scenery Preservation Board.

Mr. Thwaites outlined the aims and work of the Board and showed coloured films of the Youth Hostels already set up, of historic buildings and of general Tasmanian scenery.

16th October, 1951

A meeting was held at the Museum, Dr. C. Craig presiding.

Professor H. N. Barber spoke on "The Experimental Control of Flowering".

Professor Barber opened his address by reviewing the research work at present being undertaken in his department at the University of Tasmania. He stated that it was hoped to have Rodway's "Flora of Tasmania" revised and in the hands of the Government Printer by 1955 or 1956. The Speaker then described, with the aid of slides, experiments illustrating various factors that bear upon the flowering of plants. He pointed out, how, within limits, the flowering of plants can be experimentally controlled.

30th November, 1951

A meeting was held at the Museum, the President of the Society, Sir Ronald Cross, presiding.

The Speaker, Dr. C. Craig, gave an address on " The early history of Northern Van Diemen's Land, with special reference to York Town, Launceston, and George Town ".

Dr. Craig presented much original material connected with these early settlements and gave many previously unknown details of the founders and their ability and achievements.

The lecture was illustrated with slides of the settlements, maps and extracts of reports and correspondence.