PROCEEDINGS
OF THE
Royal Zoological Society
OF
NEW SOUTH WALES
for the year 1950-51

Price, 3/-
(Free to all Members and Associates)

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ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES
Established 1879

REGISTERED UNDER THE COMPANIES ACT 1899 (1917)

Patrons:
The Right Honourable Sir John Greig Latham, G.C.M.G.

COUNCIL, 1951-52
President: James Roy Kinghorn, F.R.Z.S., C.M.Z.S.
Vice-Presidents:
Edward John Lees Hallstrom, F.R.Z.S.
Frank Marshall, C.M.G., D.D.S.
Garnet Halloran, M.D., B.Sc., F.R.C.S. (Edin.), F.R.A.C.S.
Emil Herman Zeck, F.R.Z.S.

Members:

Henry Burgh
Norman Chaffer
Aubrey Halloran, B.A., LL.B.
Percy Fincham Harvey
James Allen Keast
Keith Collingwood McKeown, F.R.Z.S.

Anthony Irwin Ormsby, LL.B.
Theodore Cleveland Roughley, B.Sc., F.R.Z.S.
Ellis Le Geyt Troughton, F.R.Z.S., C.M.Z.S.

Officers:
Honorary Secretary: Mrs. L. Harford.
Honorary Treasurer: C. F. Laseron, F.R.Z.S.
Assistant Honorary Treasurer: L. Webber.
Honorary Editor: Gilbert Percy Whitley, F.R.Z.S.
Honorary Librarian: Mrs. M. D. Scott-Sim
Assistant Honorary Secretary: Mrs. F. E. Lane
Honorary Auditor: M. S. Davies

OFFICERS OF SECTIONS

Avicultural Section:
Chairman: L. Webber
Hon. Secretary: Percy F. Harvey

Ornithological Section:
Chairman: W. R. Moore
Hon. Secretary: A. R. McGill

Budgerigar Section:
Chairman: H. Yardley
Hon. Secretary: J. L. Bright

General Section:
Chairman: J. R. Kinghorn
Hon. Secretaries: P. R. Johnston and D. Miller

Marine Zoological Section:
Chairman: R. G. Swann
Hon. Secretary: Mrs. E. J. Jackson
Royal Zoological Society of New South Wales

The Seventy-first Annual Meeting was held at Taronga Park on Saturday, 28th July, 1951. About 160 members and friends were present. The Hon. Secretary presented the Seventy-first Annual Report.

71st ANNUAL REPORT

Membership at 1st July, 1951.—Total membership, 578, consisting of: 1 Endowment Member, 3 Associate Benefactors, 9 Honorary Members, 51 Life Members, 380 Ordinary Members, 2 Hon. Associate Members, 21 Life Associate Members, 111 Associates and 15 Junior Members. A total of 121 members were removed from the Register; 90 in terms of Article 9, 10 by death, and 21 by resignation.

It is somewhat alarming to note that the membership has decreased considerably subsequent to the increase of the annual subscription, and it is urged upon all members to make an effort to interest their friends in the Society, its activities and benefits, with a view to increasing membership.

Council.—Eleven meetings of the Council were held during the year, with an average attendance of eleven.

It is regretted that through pressure of business Mr. T. A. Everitt resigned from the office of Hon. Secretary, but the Council has been pleased to record in the minutes a tribute to the valuable service he rendered to the Society. Mrs. L. Harford, a very active member of the Society, has been appointed to succeed Mr. Everitt, and it is worthy of note that she is the first lady to hold such office and to be Councillor of this Society.

On the day of our last Annual Meeting, Dr. G. A. Waterhouse died following a long illness, and the Society lost one of its most distinguished members. Dr. Waterhouse, entomologist and a world authority on butterflies, took an active part on the Councils of several leading scientific societies. He served the Council of this Society for many years and at one time was our President. He also held the joint office of Hon. Treasurer and Secretary.

On the 30th March, 1951, our esteemed Councillor and one time President, Mr. A. S. Le Souef, died suddenly at his home at the age of 74. He had been a member of this Society for about 40 years, first as Director of the Zoological Gardens, Moore Park, and subsequently as Curator of Taronga Park. He was a Councillor for many years, and only a few days before his death had been acting as Hon. Secretary. Mr. Le Souef, who was a man of considerable charm, had a wide zoological knowledge and devoted his later years to the conservation of the Australian fauna.

Publications.—A further part of "The Australian Zoologist" will be issued at a very early date. Finance permitting, it is the hope of the Council to publish the journal at less infrequent intervals.

Finance.—Due to the shortness of time between the end of the year and this meeting, and in the absence of the Treasurer, it is regretted that a financial statement is not yet available.
**Fellowships.**—Under the terms of Article 17(a) and Rule 6 the Qualifications Committee met and examined the published scientific papers and enquired into the general zoological research of several members whose names had been submitted for fellowship. On consideration of the report the Council conferred the title "Fellow" on Charles F. Lason (Conchology), Emil H. Zeck (Entomology) and James R. Kinghorn (Herpetology).

**Sections.**—All the sections of the Society have been very active, the many interesting lectures and discussions were well attended, and the general standard of sectional work has been maintained.

**Junior Members.**—During August last year the following Rule was added to the Society's list in terms of Article 40:—

"That Junior Members, 16 years and under, be admitted to the Society at an annual subscription of 5/-, with the privileges of attending meetings and such outings as may be organised."

As a result of this 15 Juniors have been enrolled.

Mr. Aubrey Halloran moved the adoption of the Annual Report, seconded by Mr. G. P. Whitley, and carried on the voices.

The following were elected to the Council:—Mrs. L. Z. Harford, Messrs. P. F. Harvey, J. A. Keast, A. I. Ormsby, Dr. F. Marshall, L. C. Webber, G. P. Whitley and E. H. Zeck.

**Address by the Chief Secretary.**—The meeting was addressed by the Guest Speaker, The Honourable Clive R. Evatt, K.C., M.L.A., Chief Secretary of New South Wales, who said:

It is a great pleasure to attend the Annual Meeting of a Society that has for one of its objects the protection and preservation of Australian animals. This is not the first Annual Meeting I have attended, and I hope it will not be the last.

May I congratulate you all on the completion of another successful year and for the valuable work accomplished by all sections.

I particularly congratulate the Society for electing Mrs. Harford as Hon. Secretary, the first woman Councillor and the first lady to occupy this position.

Your President, Mr. Kinghorn, is a member of the Fauna Protection Panel; so, too, are Professor Murray, Mr. Hallstrom and Mr. Troughton. The Fauna Protection Panel is the statutory body created under the Fauna Protection Act, 1948. It was my privilege to move the second reading of that Act and also of the Bush Fires Act, 1949. Both those statutes contribute greatly to the protection and preservation of our fauna.

Never was there greater need for fauna protection than there is at present. The slaughter of wild life has been appalling. Some species are extinct. The survival of others is problematical. Among the latter is the koala. In one year—1924—two million koala skins were exported from the eastern States of Australia.

Could not we celebrate this Jubilee Year by protecting those unique, original Australians—our native birds and animals? I have made New South Wales a vast sanctuary for our wild life. The other States should also be sanctuaries, but what do we find? Widespread destruction of marsupial life! In the last five years, marsupials killed in the other States totalled:—

<table>
<thead>
<tr>
<th>State</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>76,000</td>
</tr>
<tr>
<td>South Australia</td>
<td>331,000</td>
</tr>
<tr>
<td>Tasmania</td>
<td>845,000</td>
</tr>
<tr>
<td>(including 250,000 opossums)</td>
<td></td>
</tr>
<tr>
<td>Western Australia</td>
<td>850,000</td>
</tr>
<tr>
<td>Queensland</td>
<td>No records kept</td>
</tr>
</tbody>
</table>
In Queensland the destruction of marsupials, kangaroos in particular, has been ruthless. In that State the Department of Agriculture is charged with the responsibility of protecting wild life. Once again in New South Wales there is a move engineered in all probability by skin dealers and professional shooters to remove fauna protection from the jurisdiction of my department. Since I became Chief Secretary, more than twelve months ago, permission to kill protected fauna has been refused.

Among the special steps taken to protect our native birds and animals is the declaration of the following species as "rare fauna":—

- Koala.
- Platypus. 
- Spiny Ant-eater.
- Southern Whip-tail Wallaby.

Lyre-bird. 
Mallee Fowl.
Brush Turkey.
Plain Turkey.

Heavy penalties, including imprisonment, await those who kill or injure "rare fauna".

The following have been removed from the unprotected schedule and are now fully protected:—

- Grey Butcher-bird. 
- Friar-bird or Leatherhead. 
- Yellow-throated Friar-bird.

Black Falcon.
Grey Falcon.
Grey or White Goshawk.

Ornithologists have urged the protection of the Wedge-tailed Eagle on the ground that at most times and in most places it does more good than harm. The Wedge-tail has been placed on probation by the declaration of a closed season for twelve months. At the end of that period consideration will be given to the question of affording permanent protection. Do not forget that in the United States the Eagle—America's national emblem—is virtually extinct as a result of senseless slaughter. We have no desire to inflict a similar fate on our national emblems—the kangaroo and the emu.

Protective action has been taken with the Wombat. It is regrettable that, according to reports, our "New Australians" are illegally killing many birds and animals. The Federal Minister for Immigration will be asked to instruct migrants concerning fauna protection. Serious consideration is being given to the question of licensing all firearms.

I have taken appropriate steps to enforce protection of the Dolphin.

As far as possible the traffic in toy Koalas made from Wallaby skins has been terminated.

In view of a recent campaign, I desire to make it clear that I have no intention of removing protection from Bandicoots.

My refusal to declare an open season for the slaughter of wild ducks led to claims that the rice crop would suffer. Figures establish that this year's rice crop will be a record and that the yield per acre will also be a record, exceeding last year's by about 10 per cent.

We should endeavour to put an end to the export trade in Kangaroo skins which are sent to the United States to be made into shoe leather. This sordid trade, it is argued, means more dollars. My view is that all the dollars would not compensate us for the extinction of our unique marsupials.

Ministers come and go. Your Society, we hope, will go on forever. I should like you as a Jubilee gesture to set up a Vigilance Committee to assist my department in the important work of fauna protection.

A vote of thanks to the Guest Speaker was proposed by Dr. Garnet Halloran and carried by acclamation.

Mr. J. R. Kinghorn then delivered the Presidential Address (see pages 4 and 5) and the meeting closed after a vote of thanks to the President had been moved by Mr. E. J. L. Hallstrom and carried by acclamation.
OFFICERS FOR THE YEAR 1951-1952

President: Mr. J. R. Kinghorn.

Vice-Presidents: Mr. E. J. L. Hallstrom, Dr. G. Halloran, Dr. F. Marshall and Mr. E. H. Zeck.

Honorary Secretary: Mrs. L. Harford.

Honorary Treasurer: Mr. C. F. Laseron.

Assistant Honorary Treasurer: Mr. L. C. Webber.

Honorary Editor: Mr. G. P. Whitley.

Honorary Librarian: Mrs. M. D. Scott-Sim.

Honorary Auditor: Mr. M. S. Davies.

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PRESIDENTIAL ADDRESS

By J. R. Kinghorn

I do not intend to give the customary zoological address today, but intend to confine my remarks to matters concerning the activities and interests of the members and sections in relation to the Society in general. More particularly I wish to make certain suggestions in regard to the part you might take in helping to reorganise or readjust the activities and so help to lift the Royal Zoological Society to a higher place than it at present occupies among the scientific societies of the Commonwealth.

In addition to attending all meetings of the Council and the General Zoology Section, it has been my privilege and duty to visit each section at least twice as time and occasion may demand.

Quite apart from zoological interests, it was my intention to gain a better idea of the work of the sections; in particular, the administrative set-up, and I wish to mention here, many seemingly trivial items, which, if given careful attention, will tend to enhance the general tone and decorum of meetings.

Perhaps I do not appreciate the value of the attendance book, other than to record addresses of members, but I do suggest that the names of visitors be handed to the Chairman or Secretary on arrival. Such will save some embarrassment and will afford the Chairman an earlier opportunity of expressing a welcome.

I have noted that some members of the Society who regularly attend one section regard themselves, or may be regarded as visitors when they attend any other section, and I actually was present at one section when several members were welcomed as visitors. It should be more widely known that members of the Society automatically become members of all sections.
It is a pity that there is, or was, a tendency to regard a section as something apart from the parent body—so much so that for many years such sections have at times demanded that a representative have a seat on the Council. I think it might be made quite clear now that Councillors represent the Society and not individual sections, and they are elected to Council at the Annual General Meeting, and that sections are constituted of those members who have banded together to study certain specific zoological subjects.

It may be stated that members of Council have not a very full knowledge or appreciation of the work of the sections. That can best be rectified by the section, and I suggest for your consideration that either a regular report or the minute book be made available for the information of the Council. Such books could be left in the Secretary’s office from time to time.

From my knowledge as ornithologist at the Australian Museum, I wish to inform the Ornithological Section that there is a constant demand for an annotated list with dates of the birds of the Sydney metropolitan area. I know that such information is on hand, and suggest that a committee be set up to consider such for publication. There is also a lesser demand for a map of marine collecting grounds, showing means of transport and the general type of fauna to be expected. This might also be considered for what it is worth. Some years ago at each sectional meeting selected members made reference to the more recent publications dealing with subjects of sectional interest. As a matter of scientific necessity this should be revived. I suggest also that a brief resume be given relative to papers in MS. or in the Press, as is done at most other scientific societies.

This leads me briefly to remark on a certain aspect of the work of sections. It would appear that too often the scientific activities of sections are quite secondary to the lecture of the evening, and sometimes such lecture is on a subject not even distantly related to the work. It is my opinion that a section has little right to exist if it has to rely entirely on a monthly lecture. During the forthcoming year I hope to look into the following matters. Some years ago the Council decided to award annually a Diploma for Zoological Research, but so far as I can find no such diploma has as yet been made.

Negotiations are proceeding with regard to the reconstruction of a cabin in National Park, though to date the results are not very encouraging.

I am suggesting the affiliation with existing Natural History Societies in the country and, if possible, the formation of country branches. In the very near future a meeting of entomologists will be called with the object of considering the possibility of re-establishing the Insectorium at Taronga Park. This has not functioned since 1917.

I would like also to see a closer association of all N.S.W. Natural History and Zoological Societies, with perhaps an Annual Conference of delegates.

You will agree that quite a lot can be and needs to be done, and I look to you, if you are interested in the Society and not only your sections, to look around and see how you can tidy matters up.
# ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

**Revenue Account for the year ended 30th June, 1950**

## GENERAL ACCOUNT

<table>
<thead>
<tr>
<th>Description</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Office Rent</td>
<td>491 18 1</td>
<td></td>
</tr>
<tr>
<td>&quot; Office Stationery and Postages</td>
<td>31 6 5</td>
<td></td>
</tr>
<tr>
<td>&quot; Telephone</td>
<td>26 11 10</td>
<td></td>
</tr>
<tr>
<td>&quot; Electricity</td>
<td>11 12 4</td>
<td></td>
</tr>
<tr>
<td>&quot; Insurance</td>
<td>7 15 0</td>
<td></td>
</tr>
<tr>
<td>&quot; Publication of “Proceedings”</td>
<td>144 1 1</td>
<td></td>
</tr>
<tr>
<td>&quot; Sundry Expenses</td>
<td>49 11 11</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>762 16 8</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
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</thead>
<tbody>
<tr>
<td>By Subscriptions</td>
<td>645 12 9</td>
<td></td>
</tr>
<tr>
<td>&quot; Rent—Sub-letting</td>
<td>85 12 6</td>
<td></td>
</tr>
<tr>
<td>&quot; Telephone Collections</td>
<td>5 1 10</td>
<td></td>
</tr>
<tr>
<td>&quot; Interest—Bank Account</td>
<td>13 3 7</td>
<td></td>
</tr>
<tr>
<td>&quot; Treasury Bond</td>
<td>3 5 1</td>
<td></td>
</tr>
<tr>
<td>&quot; Exchange</td>
<td>0 12 9</td>
<td></td>
</tr>
<tr>
<td>&quot; Sale of Badges</td>
<td>0 3 0</td>
<td></td>
</tr>
<tr>
<td>&quot; Balance, Excess of Expenditure over Income for year ended 30th June, 1950</td>
<td>753 11 6</td>
<td></td>
</tr>
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</table>

**Total**                                          **762 16 8**

## PUBLICATION ACCOUNT

<table>
<thead>
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<th>£ s. d.</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
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</thead>
<tbody>
<tr>
<td>To Surplus of Income over Expenditure for year ended 30th June, 1950</td>
<td>391 11 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By Sales—Handbooks</td>
<td>272 8 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; Australian Zoologist&quot;</td>
<td>31 11 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; Interest—Inscribed Stock</td>
<td>34 6 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; Savings Bank</td>
<td>3 5 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; Government Grant</td>
<td>341 11 8</td>
<td></td>
<td></td>
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</tbody>
</table>

**Total**                                          **391 11 8**

## BUILDING FUND

<table>
<thead>
<tr>
<th>Description</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
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</thead>
<tbody>
<tr>
<td>To Balance transferred to Building Fund</td>
<td>24 17 5</td>
<td></td>
</tr>
<tr>
<td>By Interest—Investments</td>
<td>22 15 0</td>
<td></td>
</tr>
<tr>
<td>Bank Account</td>
<td>2 2 5</td>
<td></td>
</tr>
</tbody>
</table>

**Total**                                          **24 17 5**
# ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

**Balance Sheet as at 30th June, 1950**

<table>
<thead>
<tr>
<th>LIABILITIES</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCUMULATED FUNDS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance as at 30th June, 1949</td>
<td>3,092</td>
<td>0 2</td>
</tr>
<tr>
<td>Add: Surplus for year ended 30th June, 1950</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publication Fund</td>
<td>391</td>
<td>11 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less: Deficiency for year ended 30th June, 1950—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Account</td>
<td>9 5 2</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BUILDING FUND:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance as at 30th June, 1949</td>
<td>797</td>
<td>3 6</td>
</tr>
<tr>
<td>Add: Interest received for year</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 17 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SUBSCRIPTIONS PAID IN ADVANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>137 10 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>£4,433 18 1</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASSETS</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FURNITURE &amp; EQUIPMENT:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Lecture Room Furniture and Equipment—at Valuation</td>
<td>515</td>
<td>7 11</td>
</tr>
<tr>
<td>Library Books—at Valuation</td>
<td>503</td>
<td>4 6</td>
</tr>
<tr>
<td>“Parrot” Paintings—at Valuation</td>
<td>500</td>
<td>0 0</td>
</tr>
<tr>
<td><strong>INVESTMENTS (at face value):</strong></td>
<td></td>
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</tr>
<tr>
<td>Australian Commonwealth Inscribed Stock</td>
<td>1,010</td>
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<tr>
<td>Australian Commonwealth Treasury Bonds</td>
<td>100</td>
<td>0 0</td>
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<tr>
<td></td>
<td></td>
<td>1,110</td>
</tr>
<tr>
<td><strong>COMMONWEALTH SAVINGS BANK:</strong></td>
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</tr>
<tr>
<td>General</td>
<td>506</td>
<td>2 11</td>
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<tr>
<td>Publication Fund Account</td>
<td>310</td>
<td>9 11</td>
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<tr>
<td></td>
<td></td>
<td>816</td>
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<tr>
<td><strong>CASH ON DEPOSIT:</strong></td>
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<td></td>
</tr>
<tr>
<td>Metropolitan Water, Sewerage &amp; Drainage Board</td>
<td>100</td>
<td>0 0</td>
</tr>
<tr>
<td><strong>CASH ON HAND</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 6 9</td>
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</tr>
<tr>
<td><strong>BUILDING FUND INVESTMENTS:</strong></td>
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<td>Australian Commonwealth Treasury Bonds</td>
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<td>Commonwealth Savings Bank</td>
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<td>822</td>
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<td><strong>PREPAYMENTS</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>51 5 2</td>
<td></td>
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</tbody>
</table>

**AUDITOR’S REPORT TO THE MEMBERS OF THE ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES.**

I hereby report that I have audited the books and accounts of the Royal Zoological Society of New South Wales for the year ended 30th June, 1950, and have obtained all the information and explanations I have required, and, in my opinion, the above Balance Sheet exhibits a true and correct view of the state of the Society’s affairs as at 30th June, 1950, according to the best of my information and the explanations given to me and as shown by the books of the Society.

I have examined the Register of Members and other records which the Society is required to keep by law or by its Articles of Association and am of opinion that such records have been properly kept.

(Sgd.) MERVYN S. DAVIES, A.C.A. (Aust.),
Hon. Auditor.

Sydney, 21st August, 1951.
The late A. S. Le Souef.
OBITUARIES

Albert Sherbourne Le Souef.

To his many friends and associates within the Society, and the Council in particular, news of the sudden death of Albert Sherbourne Le Souef on 31st March, 1951, at his Mosman home in Sydney, was received with a keen sense of personal loss. Not only had he been a member of Council for almost fifty years, since first assuming the Curatorship of the Society's Moore Park Zoological Gardens in 1903, but he was also its Honorary Secretary in 1908, and President in 1943-4.

It was characteristic of his self-effacing but enthusiastic sense of service to natural history that he should have occupied the presidential chair so late in his prolonged service to the Society. Equally significant was the fact that he had taken over the Acting Hon. Secretaryship as a matter of emergency at the time of his death, just prior to which he had written the President, not relinquishing the responsibility in an emergency, but expressing regret that his service to the Society must be curtailed on explicit instructions from his doctor.

The name of Le Souef has been practically synonymous with the foundation and progress of zoological display in various States of the Commonwealth. A. S. Le Souef was born on 30th January, 1877, at Melbourne, and was educated at Carlton College. The father of "A.S.", as he was affectionately known, Albert A. C. Le Souef took charge of the Albert Park Gardens, Melbourne, in the early days of the Zoological and Acclimatisation Society of Victoria. The eldest son, W. H. Dudley Le Souef, succeeded the father, while another son, E. A. Le Souef, became Curator of the Perth Zoo. After assisting his brother in Melbourne, A. S. Le Souef accepted the appointment in Sydney. The older members of the Society may well remember the controversy about the transfer of the Zoological Gardens in 1916 from the flat and unimposing site at Moore Park to the present situation at Taronga Park. It was strongly urged in many quarters that the site was too exposed and that the more tropical kinds of animals would suffer in consequence. Who can doubt that the wealth of knowledge, gained from childhood under his distinguished father, as well as an innate love and understanding for wild creatures, was largely responsible for the successful establishing of the zoological gardens at the new site? He continued in charge until his retirement in 1939, and the world-wide acclaim of Sydney's Taronga Park must ever remain as a tribute to his planning and efforts for its foundation.

Arising from his close study of captive fauna, A. S. Le Souef became a comprehensive student of wild life, contributing a number of papers on birds to The Emu, journal of the Royal Australasian Ornithologists' Union, of which he was one of the few remaining original members. He also went to considerable personal expense in obtaining specimens of marsupials and indigenous rats and bats from a wide range of localities. Several papers were written upon mammals, notably the naming of the Great Grey Kangaroo of Tasmania as a distinct species. The writer had the privilege of
co-authorship with him in naming a very distinct species of Ring-tail Possum from the Bunya Mountains of south-east Queensland. In one’s early experiences in organising the new Department of Mammals at the Museum, Le Souef was to prove a generous and encouraging collaborator, especially in the preparation of The Wild Animals of Australasia, in company with the late Harry Burrell, which appeared in 1926.

As a lover of nature, he was particularly interested in several societies concerned with conservation of the flora and fauna and, indeed, it was in such activities that he found his greatest satisfaction after retirement. He was a member of the Royal Society and the Linnean Society of New South Wales, and a Corresponding Member of the Zoological Society of London. The writer well remembers the great enthusiasm of Le Souef, after the Second World War, on deputations to Canberra advocating the establishment of a National Fauna Park in accordance with the original plans for the capital. He was also a member of the joint Committee of the Linnean and Royal Zoological Societies for planning and carrying out a Scientific Survey of Kosciusko State Park, under the leadership of Dr. W. R. Browne.

Le Souef loved the gorse-y alpine heights of Kosciusko and the rugged tree-covered slopes of the Snowy River. He was perhaps most at home at the Creel after a day’s troutting, and one likes to remember him in good companionship around the fireside, for in such surroundings his gentle soul found its happiest expression. People believed in him and his work, and one might quote of him, from Browning’s Lessons from the Gorse:

Mountain gorses, do you teach us  
From that academic chair  
Canopied with azure air,  
That the wisest word man reaches  
Is the humblest he can speak?  

E. Le G.T.

We regret to record the following deaths of distinguished zoologist members during the year:—

Professor W. E. Agar, C.M.G., F.R.S., etc.
Mrs. Edith Coleman.
Professor T. Harvey Johnston.
Mr. Harold John Finlay.

NOTES AND NEWS

A Mantis Shrimp from Elizabeth Reef.

In the account of the zoology of Middleton and Elizabeth Reefs, a complete list of the Crustacea Decapoda collection was given (McNeill, Austr. Zool., viii, 4, 1937, p. 263). One crustacean, which formed the balance of the collection, was a Stomatopod or Mantis Shrimp, at that time beyond identification. Only recently this interesting species has been critically examined by Dr. R. Serene, and he has determined it as his own species described in Bull Mus. Nat. Hist. Nat., Paris (2), xxxii, 5, 1950, p. 571, as Gonodactylus tweediei. A more comprehensive description, with figures by Dr. Serene, based in part on the single specimen from Elizabeth Reef, collected by G. P. Whitley, is to appear in the forthcoming Records of The Australian Museum.

F. A. McNeill.
REPORTS OF SECTIONS
AVICULTURAL SECTION

From January the meetings have shown an improvement in the attendances—an average of sixteen and twenty-one at the May meeting, when Mr. N. Chaffer entertained members and visitors with his excellent films of New Guinea and the Birds of Paradise.

During the year we have been entertained with films and lectures by the following:

January: Mrs. Harford, with films of Whipsnade Zoo and Namatjira the Painter.
February: Mr. L. Webber. Lecture on the "Genetics, Colour Factors and Breeding of the Gouldian Finch".
March: Mr. S. Dummett. Lecture with exhibits of Aviary Accessories.
April: Mr. J. Hallstrom. Lecture, "The Search for the White Bird of Paradise in New Guinea".
May: Mr. N. Chaffer. Colour films of New Guinea.

In closing may I ask members to keep the section on the upward trend by attending regularly and by introducing new members and inviting visitors and friends to the coming year's meetings.

Percy F. Harvey,
Hon. Secretary.

BUDGERIGAR SECTION

In presenting the Annual Report of the Budgerigar Section, I do so with the greatest satisfaction, as the year concluding, June, 1951, has proved the outstanding year in the history of the section.

The average attendance at the meetings during the concluding year has been 42, which is an increase of 12 over the previous year.

The support of the Juniors has been outstanding by their participation in the Table Shows and the work at the Annual Lawn Show.

The following are the details of the meetings held during the year:

1950—
August: "Colour Mating". Lecture by Mr. T. McSwiggan.
September: Budgerigar Quiz.
October: Table Show. Any other variety Budgerigar.
November: Table Show. Young Bird, Unbroken Cap.
December: Question Night.

1951—
January: Table Show. Young Bird, Broken Cap.
February: "Preparing Birds for Show". Lecture by Mr. S. Maher.
March: Table Show. Pair Class.
April: Question Night.
May: Table Show. Type only.
I extend the sincere thanks of the members to Mr. T. McSwiggan and Mr. S. Maher for having extended to the section their time and knowledge by the means of lectures to our meetings.

The outstanding meeting of the year was the Quiz Night, the attendance on the evening being 48. During the quiz all questions were in relation to the Budgerigar, embracing the breeding, standard, show rules and genetics. The quiz brought forward many questions of interest to all present, the questions being compiled by Messrs. Maher, T. McSwiggan and H. Yardley.

The 15th Annual Lawn Show, held at the residence of Mr. and Mrs. Vincent Fairfax, "Elaine", 550 New South Head Road, Double Bay, on Saturday, 24th February, 1951, was the outstanding success of all past shows. 325 birds were exhibited, and their overall quality showed a marked improvement. One judge remarked especially on the Juvenile Section as one of the hardest classes to judge in the show. The Newcastle exhibitors proved particularly strong—of six exhibitors, four were trophy winners. We are indebted to Mr. Vincent Fairfax for having granted the use of his home and grounds for the staging of this event, and to Mrs. Fairfax for presenting the trophies and providing afternoon tea for exhibitors and visitors; to both we extend our sincere thanks.

The section wishes to convey to Mr. E. J. Hallstrom its sincere thanks for his generous donation to the trophy list, which helps to provide such a display of trophies and create keen competition.

In conclusion, the Chairman and myself wish to convey our personal thanks to all in appreciation for the support accorded to the section during the year and at the Annual Lawn Show.

J. L. BRIGHT,
Hon. Secretary.

GENERAL SECTION

Due to power restrictions, the February meeting of this section had to be cancelled. The remaining meetings, however, provided an interesting and varied series of lectures and discussions.

Although attendances were maintained at monthly meeting, it is felt by members that the high standard of lectures during the past year should have brought a much greater response.

Highlights among the lectures for the year were:—

Corals of the Great Barrier Reef.
Furred Animals of Australia.
Sharks.
Aphids.
Spiders.

On two occasions, owing to the absence of the lecturer, the Chairman obliged with talks on "The Historical Background of the Australian Museum" and "Amphibia".

Several evenings were devoted to discussion of various aspects of zoology. These gave members the opportunity of stating their views on such contentious matters as "The Species Concept", the ability of insects to establish themselves in new areas, etc.

It is hoped that the lectures decided upon for the new year will furnish members and visitors with interesting and educational information on subjects that have not previously been discussed during the post-war activities of this section.

J. R. KINGHORN, Chairman.
A. I. ORMSBY, Hon. Secretary.
MARINE ZOOLOGICAL SECTION

Regular monthly meetings were held in spite of lighting restrictions, and the interest and keenness of members has been evident during the year 1950-51. New members have joined the Society after being guests at several lectures. It has been pleasant to note the increased attendance at lectures and field days, while the conchology study group held eleven meetings, which were as popular as previously.

FIELD DAYS.

1950—

Sunday, 27th August: Gunnamatta Bay.
Sunday, 10th September: Kurnell.
Saturday, 14th October: Bottle and Glass Rocks.
Saturday, 11th November: Long Reef.
Saturday, 9th December: Shark Island.

1951—

Saturday, 24th February: Bottle and Glass Rocks.
Saturday, 24th March: Long Reef.
Saturday, 21st April: Gunnamatta Bay.
Saturday, 19th May: The Spit.
Sunday, 17th June: Bayview.

The excursion to Shark Island on December 9th took the form of a Christmas picnic for members and their friends. Launch transport was kindly supplied by the Maritime Services Board. At the May outing to The Spit an interesting fact was fact was recorded—quantities of live Smaragdella pulcherrima (Angas) were observed on the weeds at low tide (inner harbour).

LECTURES

1950—

5th September: “Sea Stars, Sea Urchins and their Neighbours”, Miss E. Pope.

1951—

2nd January: Work on the Cabinet. Members only.
3rd April: Game Fishing (films), Mrs. L. Harford.
5th June: Work on Cabinet and Election of Officers.

The lectures were of a very high standard and stimulated the interest of students both in the particular subject of the lecture and in the section generally. The section wishes to express its appreciation and thanks to the above lecturers for the knowledge they have imparted to us.

E. F. HOLLAND, Chairman.
L. HARFORD, Secretary.
ORNITHOLOGICAL SECTION

It is pleasing to report a year of keen ornithological activity and well-attended meetings. Attendance at the regular monthly meetings compared favourably with past records. 73 members and friends were present at the March meeting, and the monthly average over the period was 54.

Details of the meetings are as follows:—

1950—
July 20: “Cockatoos”: General Discussion, led by Messrs. Francis, Keast and MacKay.
August 17: Film Slides and Commentary, by J. E. Roberts.

1951—
January 18: Film Slides and Commentary, by K. A. Hindwood.
March 15: Colour Films, by Norman Chaffer.

No organised outings were arranged, but individuals showed the necessary enthusiasm and many full-day or afternoon outings by members were reported. A most successful event arranged by the section was the Annual Congress and Camp-out of the Royal Australasian Ornithologists’ Union. The Congress, held in the Lecture Hall of the Australian Museum on October 24th, was opened by the Chief Secretary, the Hon. Mr. Clive Evatt. Further events whilst the delegates were in Sydney were a civic reception, full-day outing to the National Park and welcome by Mr. Mark Gosling on behalf of the Park Trustees, films screened by Mr. Norman Chaffer and a reception luncheon at Taronga Park by the Trust and address by Mr. E. J. L. Hallstrom. The camp-out was held at ”Derra Derra”, 14 miles west of Bingara, over a period from October 27 to November 6. The number attending—53—was probably a record for such an event, and taxed the excellent accommodation facilities. A number of section members participated. Other distant trips made by section personnel were by A. H. Chisholm to south-central Queensland, J. A. Keast to Flinders Island to participate in the Mutton-bird survey, Don Miller to Cape York, whilst Messrs. Chaffer and Moore returned from their European tour.

The committee held a few meetings during the year, mainly to debate upon the protection of avifauna in the State. Co-operation was evident with the Fauna Protection Panel. The Grey Butcher-bird (Cracticus torquatus), Noisy and Little Friar-birds (Philemon corniculatus and P. citreogularis), Grey or White Goshawk (Accipiter novaehollandiae), Grey and Black Falcons (Falco hypoleucus and F. subniger) were all added to the list of protected birds by the Minister on the recommendation of the Panel following approaches by the section. The Mallee Fowl (Leipoa ocellata) was declared “rare fauna” within the State, when the necessity for protection was urged by the committee following investigation by A. H. Chisholm. The Lyre-bird (Menura novaehollandiae), Brush Turkey (Alectura lathami) and Plain Turkey (Bustard) (Eupodotis australis) were also fittingly added to the “rare fauna” schedule. The status of the Wedge-tailed Eagle (Uroaetos audax) was also discussed, and the hope is held that this
noble bird might yet receive full protection, especially in certain areas where it is now becoming rare. The committee supported Miss Crommelin in her request to obtain a National Botanic Garden, Fauna Park and Australian Arboretum by an extension of the Warrah Sanctuary and the grant of an endowment to provide suitable guardianship.

Mr. Chisholm reported that Trans-Australia Airlines, following a request to him, had named two of its skymaster 'planes "John Gilbert" and "John Gould" respectively—a fine tribute to two noted ornithologists.

At the Annual Meeting all retiring officers were re-elected:

Chairman: J. S. Waterhouse.
Vice-Chairman: J. Francis.
Secretary: A. R. McGill.
Assistant Secretary: J. A. Keast.

ARNAOLD R. McGILL,
Section Hon. Secretary.

FIELD REPORT OF THE ORNITHOLOGICAL SECTION FOR 1950-1951

Field observations of birds throughout New South Wales generally are regrettably restricted. Whilst the environs of Sydney are well watched for noteworthy records, the lack of sufficient country observers is unfortunate. During the year the far-western parts of the State received abnormal rains, but scarcely any report of any expected large concentration of bird life was received. Such favourable conditions for gregarious nesting water-birds were evidently the reason why common Sydney-frequenting species, such as the White-eyed Duck (Aythya australis), Grey Teal (Anas gibberifrons), Coot (Fulica atra) and White Egret (Egretta alba), were practically absent from their usual haunts for eight months of the year. In the late autumn of 1951 all had returned, the Coot, especially, arriving in great numbers. Inland species, such as the Plumed Egret (Egretta intermedia) and Marsh Tern (Chlidonias hybrida), which visit the metropolitan area somewhat regularly for a short period each spring, apparently failed to arrive in 1950. Migratory waders were also noticeably fewer in numbers than usual.

No visit by any city member to far-western State areas was reported. A number participated in the Campout at the R.A.O.U. at "Derra Derra" station, north-western New South Wales. Birds were observed in good numbers both as individuals and species and an interesting list was compiled. The overlap of typical eastern and western forms was noteworthy and the locality might be considered one of the few places in the State where one could see side by side the King Parrot (Aprosmictus scapularis) and Blue Bonnet (Psephotus haematogaster), Brush Turkey (Alectura lathami) and Red-tailed Thornbill (Acanthiza pusilla albiventris), Tawny Grassbird (Megalurus timoriensis) and Red-backed Kingfisher (Halcyon pyrrhopygia), Turquoise Parrot (Neophema pulchella) and Little Wood-Swallow (Artamus minor), and the White-browed Scrub-Wren (Sericornis frontalis) and Purple-backed Wren (Malurus assimilis).

A most noteworthy Sydney record was the arrival of a Common Noddy (Anous stolidus), which frequented Long Reef during a period of three months. First seen by Mr. Palmer, it was identified and observed by many local bird enthusiasts. There are only two previous known State records of the species. Another unexpected sea-bird arrival was the recovery of a storm-washed White Tern (Gygis alba), picked up near Grafton and forwarded to the Australian Museum, to become the first-known specimen
for Australia, although previously thought to occur occasionally off our coast. Specimens also received by the Australian Museum included the Great-winged Petrel (Pterodroma macroptera), White-headed Petrel (P. lessonii) and Sooty Tern (Sterna fuscata)—all picked up on Dorrigo showground by Mervyn Goddard after a cyclone along the coast. Good numbers of albatrosses were recorded at Malabar during the winter—the Black-browed (Diomedea melanophris) and Wandering (D. exulans) both being identified. In the same locality the Giant Petrel (Macronectes giganteus) was common and the Great Skua (Catharacta skua) occasionally seen. During the summer the Pomarine Skua (Stercorarius pomarinus) was in probably larger concentrations than usual. Both at Port Macquarie and Harrington (north coastal towns) the remains of Gannets (Sula serrator), possessing leg-bands, were washed up, which proved that they were ringed some months previously as young birds at the Cape Kidnappers gannetry in New Zealand.

In the late winter of 1950 a Pied Butcher-bird (Cracticus nigrogularis), first recorded by Mr. Gannon, was seen by many members subsequently in the vicinity of a Pymble golf course. Some of our rarer pigeons paid short visits: the Green-winged Pigeon (Chalcophaps chrysochloris) was seen at Beecroft in May, the Wonga (Leucosarca melanoleuca) at Bayview in February, the Brown Pigeon (Macropygia phasianella) at Lindfield in July and the Topknot Pigeon (Lopholaimus antarcticus) reported in Hyde Park. The Scaly-breasted Lorikeets (Trichoglossus chlorolepidotus) were in company with good numbers of Rainbow Lorikeets (T. moluccanus) at Lindfield, where the latter species again nested. A few flocks of King Parrots (Aprosmictus exsapidalis), larger than usual, were amongst autumn records, being seen both at Gymea and Pennant Hills Crescent Honeyeaters (Phylidonyris pyrrhoptera) occurred in good numbers also at the former suburb. The little Friar-bird (Philemon citreogularis) rarely visits Sydney, but some were seen feeding in flowering coral trees at Taronga Park in June (Hindwood). The Drongo (Chlidia bracteata) was recorded in the northern suburbs, Golden Bronze Cuckoo (Lamprococcyx plagosus) seen during July at Lugarno and the Blue-winged Shoveler (Anas rhynchos) noted both at St. Marys and Eastlakes. The Sooty Oyster-Catcher (Haematopus fuliginosus) was seen at Boat Harbour in September and also returned, after an extended absence, in small numbers to Long Reef. Also at Boat Harbour, amongst the wader flocks, the Grey Flover (Squatarola squatarola) was observed twice.

A pair of Rock Warblers (Origma rubricata) added to their tradition for strange nesting places by building a nest under the spring mattress of an occupied bed in a caretaker's home in The National Park. Lyre-birds (Menura novaehollandiae) selected the nest site used two years previously at Roseville, renovated to rear their young. Magpie-Larks (Grallina cyanoleuca) apparently nested throughout the year, and at one nest Mr. Chaffer observed the adults feeding the young on trapdoor spiders, surely further proof of the usefulness of the ubiquitous "Peewee".

A. R. McGill,
Honorary Secretary.

SYLLABUS OF SECTIONAL MEETINGS
FOR 1951-52

(Visitors are welcome and members are invited to bring their friends.)

Avicultural Section.

Meets on the fourth Tuesday of each month. Lectures, films, etc.

Budgerigar Section.

Meets on the third Tuesday of each month.

Syllabus:

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1951—
August 21: Lecture, Mr. S. Maher.
September 18: Table Show, A.O.V.
October 18: Budgerigar Quiz.
November 20: Table Show. Young Bird Unbroken Cap.
December 18: Convivial Evening.

1952—
January 15: Table Show. Young Bird Broken Cap.
February 5: "Elaine" Lawn Show.
March 18: Table Show. Pair Class.
April 15: Films.
May 20: Table Show. Type only.
June 17: Annual Meeting.
July 15: Lecture.

General Zoological Section.
1951—
Meets on second Tuesday of each month.
July 10: General Zoological Discussion.
September 11: "Beginnings of Life on Land", Mr. J. A. Keast.
October 9: "Acclimatisation of Horned Dragons", Miss E. McFadyen.

1952—
January 8: "Spiders", Mr. A. Musgrave.
February 12: "Myxomatosis", Mr. J. Elliot.
March 11: "Beetles", Mr. H. Zeck.
April 8: "Australian Palaeontology", Mr. H. O. Fletcher.
May 13: Film Night.
June 10: Annual Meeting and Chairman's Address.

Marine Zoological Section.
Meets on the first Tuesday of each month.

1951—
July 3: Film Night, showing films of Norfolk Island and Hawaii and Heron Island.
August 7: "Animals Without Mackbones", by Mr. Mervyn Sheldon.
October 2: "Some Stages of Vertebrate Evolution", by Professor P. Murray.
November 6: "Lake Eyre River Basin", by Mr. M. Sawtell.
December 4: Mr. F. A. McNeill.

1952—
January 1: Work on the Cabinet.
February 5: "Drawings of Australian Fishes", by G. P. Whitley.
March 4: "Prawns", by Mr. Walton.
April 1: Mr. A. Colefax.
May 6: Mr. T. Iredale.
June 3: Work on Cabinet and Election of Officers.

The subject for each monthly meeting is advertised in the "Lectures" column of the Sydney Morning Herald usually on the prior Saturday.
Conchology Study Group.
Meets at 7.30 p.m. on the second Thursday in each month.

1951—
July 12: “How to Make Exchanges”, Discussion by all members.
August 9: “Veneridae”, Mrs. L. Woollacott.
September 13: “Collecting Land Shells at Jenolan Caves”, Mr. D. McAlpine.
October 11: “Australian Chitons”.
November 8: “Cones of Australia”, Miss G. Thornley.

1952—
“Land and Fresh Water Shells”, Mr. C. McLaughlin.
February 14: “Rare Shells”, Miss E. E. Duff; “Shells from Broome”,
Mrs. N. Jackson; “Olives in My Collection”, Mr. R. Swan.
March 13: “Rare Australian Cowries and Volutes”, Miss G. Thornley.
April 10: “N.S.W. Mitres”, Mr. C. Laseron.
May 8: “Cavolinidae, Tethyidae”, Miss J. Allan.
June 12: Table Display. “Beautiful Pectens and Chlamys from all
over the World”. Members’ Night. General Discussion.

Ornithological Section. N.S.W. Branch, Royal Australasian
Ornithologists’ Union.
Combined meetings are held in the R.Z.S. Rooms, 6th Floor, Bull’s
Chambers, 28 Martin Place, each month on the third Thursday, at 7.45 p.m.
Visitors are always welcome.

SYLLABUS FOR 1951-1952

1951—
September 20: Question Night.
October 18: Films from the Department of Information.
December 20: General Discussion on Sandstone Birds.

1952—
February 21: General Discussion on Vocal Mimicry.
March 20: Films by Norman Chaffer.
May 15: General Discussion on Shale Birds.
June 19: Annual Meeting: Chairman’s Address.

GOLDEN PEAS MAKE GOLDEN PUDDINGS
By Tarlton Rayment, F.R.Z.S.

Just how much longer certain Australian wild-bees could keep their
secrets from prying eyes has long interested students of the honey-gatherers.
The bees in question closely resemble honey-bees, of a stout “cobby” appear-
ance, although they are somewhat smaller, yet they are equally hairy. The
males, however, have a much redder aspect, due to their thick fleece of
rufous hair, and the red bands on the dark-brown abdomen. They are
included in an interesting but very limited genus of two or three species.
Professor T. D. A. Cockerell described the male, Andrenopsis flavorufus,
as far back as 1905, and twenty-four years later, in 1929, he admitted that:
“Nothing is known of the habits of the genus, and the female is unknown”.
It seemed, therefore, well worth while to discover the female and learn a little of its life-history. The information was to come from an unexpected quarter in 1950.

Australians cling tenaciously to the place-names so dear to their English forebears. One would have thought that the individuality of youth, and a proper appreciation of the arresting features in a unique land, should have resulted in the retention of the no less euphonious aboriginal names.

There are several Cheltenhams scattered over the six States of the Commonwealth, and all are pleasant places, but very different indeed from the famous Spa in England. Cheltenham, in Victoria, is an attractive village, three miles or so east of my home on Port Phillip, but one may still glory in the creamy acres of wedding-bush, *Ricinocarpus pinifolius*, there are also the golden peas of the bush, *Dillwynia*, *Platyllobium*, *Daviesia*, and, of course, the ubiquitous tea-trees, *Leptospermum laevigatum*. It is a good place for the naturalist, and I have spent many days searching for the chubby, hairy wild-bees—but without success.

Cheltenham, in South Australia, is more noted for its racecourse than for its natural history. There is, however, yet another Cheltenham, in New South Wales, some fifteen or so miles north of Sydney, a delightful sort of village, where it is still possible to study the native flora in its natural setting. The *Dillwynia* is there, also the *Daviesia* and the *Platyllobium*; in short, there is an abundance of bush-peas, parrot-peas, flat-peas, all of which yield golden pollen-grains shaped like a miniature plump grain of wheat. There is, of course, the Christmas-tree, *Ceratapetalum gummiferum*.

The bright-golden colour of the pollen will wash off when treated with ether, leaving the grains almost glassy. It is evident that the colouring is due to the presence of a rich oil, which stains the puddings, and even colours the larvae of the bees a delicate pale salmon-colour. Indeed, the ethereal oil stains even the cradle-gowns woven in earthen cells. Staining with Sudan red proved that the oil is fatty in nature, and probably holds the perfume of the flowers.

Norman Rodd, rambling along a bush-track, where the sandy soil contains a modicum of clay, discovered a few undistinguished holes; that is, the shafts did not differ in any salient character from those of dozens of other fossorial bees. There is no pit-mouth, "crater" or tiny symmetrical volcano formed by the debris brought up from below. There is a mere shaft leading down to the earthen cells.

There were fifteen or twenty shafts scattered over an area of, say, a couple of square yards, but they were mere holes in the ground. Just what becomes of the "spoil" brought up from below we do not know.

The tumulus or mound of fine soil formed by certain other bees soon dries in the air, and is then readily dispersed by wind and rain. Certain wasps, such as *Sericophorus*, rake in the loose soil to fill the shaft, and "tread" it down firmly, as a man would compact a bale of wool.

The shafts of *Andrenopsis* wind down, at first at a slight angle, but then drop vertically to a depth of about eight inches. The grape-shaped cells, three or four in number, are disposed at various levels below the surface of the ground at two, three, four or even five or six inches down. All are closed off from the main shaft by neatly fitting plugs of earth cunningly inserted by the mother. It is an architectural feature used by many bees, even *Halictus*, which is far, far removed from *Andrenopsis*.

The walls of the interior of the cells, the earthen cradles for the baby bees, are trimmed by the mandibles to a smooth "finish", and later are draped with a delicate membrane, which is applied by the short, wide glossa possessed by all colletid bees. *Halictus*, on the contrary, adorns her cells with the thinnest of thin varnish that is almost imperceptible to the eye.
The rather dry "puddings", for the sustenance of the babies, are harvested by the industrious females from the golden bush-peas, *Pultenaea elliptica*, and they are rich in oil. Strangely, *Parasphecodes*, another fossorial bee related to *Halictus*, actually discharges surplus oil from pollen by a physiological process, and in certain experiments on the hive-bee, *Apis*, the author was able to determine that an excess of fatty substances in the food—over 7 per cent.—brought about severe distress by digestive troubles. In general, it can be said that, on the whole, bees are not fitted physiologically to digest fatty foods.

The babies of *Andrenopsis* are typical of the Family; that is, they are smooth and plain in structure and lack the numerous spines and hooks that distinguish the pupae of *Halictus*, and, indeed, of many fossorial wasps in the Family Sphecidae. One is tempted to postulate that the Halictidae are as old, or perhaps even older, than the Colletidae.

It is plain to all Hymenopterists that the great superfamily of bees, *Apoidae*, had a bi-phylogenetic origin, but it would be unwise to attempt a separation by the character of the "tongue" or glossa; short and wide for the Colletidae, and acute and long for Halictidae, because in the genus *Meroglossa* the females have a short broad tongue, and the males an acute long form. On this ground alone systematists have long abandoned the old divisions of obtusilingues and acutilingues.

It is more logical and safer, in the author's opinion, to separate the two great families by a character which has hitherto not received the consideration it deserves. Colletid bees require twelve months to complete the biological cycle, but many halictid bees complete the cycle in four months; at least, that is the case with most of the Australian species investigated by the author. It is certainly true of many American and European bees.

However, let us return to *Andrenopsis flavorufus*. On fine warm days the sexes indulge in some love-making among the golden blossoms of the bush-peas. The males are unlike the females, so that the pairs are not easily associated unless they be taken together.

The bees conform with certain fundamental laws of beedom—the males appear before the females, and they are smaller, which is not surprising, since they invariably receive less food. But a nice point arises: are the somatic cells of males smaller than those of females? It would appear that the germ-cells of both sexes are approximately of equal size.

Kerr (1) has shown that in *Melipona*, at least, the castes are due to genetic factors and not to food. Sanderson and Hall (2) have suggested that "as a nuclear constituent, desoxyribonucleic acid (D.N.A.), is constant for any one species, if the amount per unit of tissue weight be ascertained, then the number of cells present in any sample can be determined... it may be possible, by a comparison of male and female tissues in parthenogenetic species, to determine whether differences of body size are due to differences in number of cells".

*Andrenopsis flavorufus* Ckll.


Allotype, Female: Length, 11.5 mm. approx. Blackish-brown. Head transverse, shining, coarsely punctated; face with white hair laterally; frons coarsely rugoso-punctate; large depressed facial foveae; clypeus coarsely punctured, rising to a broad median band which is impunctate and polished, and with the thickened margin, forms a T-shaped area; supraclypeal area impunctate, polished, rising to a fine carina that encircles the median ocellus;

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Plate 1. (See page 22 for Explanation.)
vertex closely and coarsely punctate; compound eyes with anterior margins parallel; genae coarsely punctured, white hair; labrum black, a long oval, a fimbria of golden setae; mandibulae broad, spoonlike, a median reddish patch; slender scapes, flagellum submoniliform, black above, reddish beneath.

The glossa very broad and deeply emarginate; salivarium large, four segments in labial, and six in maxillary palpus, maxillary combs exceedingly well developed; the strong subantennal pit is connected to the large tentorial pit by a deep suture as in Cladocerapis colmani Raym.

Prothorax not visible from above; tubercles black, a fringe of white hair; mesothorax duller, contiguous punctures, a few dark hairs on disc, ochreous hair on margin; scutellum shining, punctures larger, black hairs; postscutellum rugose, ochreous hairs; metathorax with a small area of coarse rugae enclosed with a line of deep pittings; pleura shining, scattered punctures, a delicate sculpture; abdominal dorsal segments so closely punctured as to appear granular, hind margins reddish, inconspicuous lines of golden hair, basally a line of white hair, an anal fimbria and red pygidial plate; ventral segments polished black, fringes of white hair.

Legs strong, black, a dense scopa of white hair on hind pair; a long narrow patella coarsely punctured; tarsi reddish-black, short and broad, ochreous hair; claws reddish-black, short, and hind calcar amber, closely and coarsely pectinate; tegulae piceous, polished; wings infuscated; nervures blackish-brown; two cubital cells longer than the radial cell; pterostigma small, brown, with a darker margin; hamuli eleven, strongly developed.


Allotype in the collection of the author.

Allies: Quite unlike the male, since it lacks his bright-fulvous hair. A. velutinus Ckll. is closest, but smaller, with much red on the abdomen. The legs of the male A. flavorufus are clear-ferruginous, and the calcar is remarkable, but the metathorax has a similar sculpture. Andrenopsis is closer to Cladocerapis than to Euryglossimorpha, for the six or so spines of the strigilis are entirely lacking in the latter genus, although the former has three cubital cells; all have a large pygidial plate.

**Explanation of Plate 1**

1. Front of head-capsule of female Andrenopsis flavorufus Ckll.
2. Antenna-cleaner (strigilis) of front leg.
5. One of the claws of the feet.
6. The large pygidial plate at the end of the abdomen.
7. Short broad glossa and other mouthparts of the female.
8. Lateral view of female with hind leg loaded with pollen.
9. Tarsal segments of front leg.
10. Maxillary palpus more highly magnified.
11. The jaw of the male is similar to that of females from Lane Cove.
12. Seventh sternum of male.
14. Sixth sternum of male.
15. Fifth sternum of male.
17. Maxillary comb enlarged.
18. Eighth abdominal sternum of male.
19. Ninth sternum of male. (By the structure of these sterna Andrenopsis approaches the genus Trichocolletes.)
20. Pectinate spur of hind leg of female.
22. The spoonlike jaw of one female from Cheltenham.
23. Rugoso-punctate sculpture of the frons.
24. Hooklets (hamuli) of the smaller hind wings.
25. Punctate sculpture of mesothorax.
(The abdominal sterna are numbered morphologically, and the various organs are not in their natural positions, but are somewhat distorted by pressure of the cover-glass on the mounted preparations.)

NOTES ON CERAMBYCIDAE

By KEITH C. McKEOWN, F.R.Z.S.
Assistant Curator of Insects, Australian Museum, Sydney

A NEW GENERIC NAME: In a recent paper, "Revision des 'Homonoeni'" (Loungicornis, i, 1950, p. 334), St. Breuning establishes a new genus, Heterometopia, to accommodate Heteroclytomorpha brunnea Aurivillus (Ark. f. Zool. A/17, 1923, p. 14) from Digoer, New Guinea. The name Heterometopia is, however, untenable as it is preoccupied, having been used in 1846 by Macquart for a Dipterous genus (Mem. Soc. R. Sci. Lille, 1844 (1846), p. 298). I am, therefore, renaming this Cerambycid genus Metopivaria.

SORMEA ORIGINI: In the same paper (p. 346), Breuning redescribes Sormea orbignyi Guerin from Port Praslin, New Ireland, and states that "La description ci-dessus se base sur un individu de 26 mm. de long et de 9 mm. de large, de la collection OBERTHUR, etiquete: 'Port Jackson, Type'". It would seem certain that this label became attached to the specimen in error and at a comparatively much later date, and it can only lead to confusion concerning the distribution of the insect. Sormea orbignyi has not been recorded from Australia. Such a possibility is extremely remote, and should it occur on this continent, it would be in the extreme north, and not in the temperate vicinity of Sydney (Port Jackson). Many instances have occurred where erroneous locality data have been attached to insect specimens collected on the early expeditions, and produced confusion. It is extremely unlikely that the label, referred to by Breuning, was attached to the specimen by Guerin, who gives the locality definitely as "Port Praslin", and can in consequence have no value whatever. Its later origin is strongly borne out by the addition of the word "Type", since it was not the custom of entomologists in 1831 to designate their type specimen. The use of the term "type" by some French workers merely meant "typical". The labelling of the specimen selected as the type as such has probably been followed for little more than the past half century.

LAGOCHIRUS FUNESTUS: A note by Dr. P. Lepesme (Longicornia, i, 1950, p. 588) pointing out the apparent rarity of this species, introduced from Mexico into Australia and South Africa to combat prickly pear, drew my attention to the fact that it was not represented in the Australian Museum Collection. Thanks to the friendly co-operation of Mr. Alan P. Dodd, Director, Department of Public Lands, Biological Section, Sherwood, Queensland, who sent specimens, it has been possible to examine this insect, hitherto unknown to me. It was at once apparent that it is identical with the insect described by me as Karadina nudila in 1942 (Rec. Aust. Mus., xxxi, p. 97, fig. 9). My genus and species are, therefore, absolute synonyms of Lagochirus Ericson, 1847 and funestus Thomson, 1865.

It is extremely interesting to note that the type of my species was stated to have been bred from the branch of Acacia sp., collected in the Carnarvon Range, S. Queensland, in the pupal state, by Mr. N. Geary, a very reliable collector and observer. A second pupa, found in a similar situation, died without emerging. It would appear from this that this insect, the natural food-plant of which is Opuntia, spp., may, under the changed conditions of its adopted habitat, have become adapted to a new, and very different, host. Mr. Dodd, however, in litt., believes that an error was made in associating the insect with Acacia.
"LONGICORNIA": The publication of the first volume of a new entomological periodical is an event of considerable interest, but it is to workers on the Cerambycidae that the issue of volume i of Longicornia will be of special importance. Longicornia. Etudes et Notes sur les Longicornes is published in Paris, under the direction of my fellow worker, Dr. P. Lepesme, by Paul Lechevalier, who is also editor. The first volume, issued in 1930, contains over 600 pages, and is illustrated with a fine coloured plate and many accurately drawn text figures. Surely France can be suffering little of the publishing-pains so constantly experienced here! Papers of particular interest to Australian workers are "Revision des Parmenini", "Revision des Homonoeni", by St. Breuning; "New and Rare Lamiinae", by E. F. Gilmour, and "Sur la Dispersion par l'Homme et l'Acclimatation de quelques Phoracanthini", by Dr. P. Lepesme.

The thanks of all workers on the group will go out to Dr. Lepesme for his initiative in producing Longicornia.

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THE TAIPAN
By Roy Mackay

Since it was first brought to the notice of the public about 1923, the Taipan has received much publicity. Its reputation as a killer is not without foundation, for only one person has survived its bite. Prompt first-aid treatment and administration of antivenine may have prevented many of the deaths.

This snake was first named Pseudechis scutellatus. It was described by a German named Peters in 1867 from a specimen in the Godeffroy Collection from Rockhampton, Queensland. About 60 years later Mr. J. R. Kinghorn, of the Australian Museum, named two snakes from Coen, Cape York, as a new species, Oxyuranus maclemani. Then in 1933 Dr. Donald Thomson, an anthropologist, who collected several specimens of this snake in Cape York, wrote an article stating that Peters' and Kinghorn's snakes were the same species and so derived the name Oxyuranus scutellatus. Thomson states that Peters' snake came from south-east New Guinea, but investigation showed this statement to be incorrect. Boulenger gives the reference to Peters, but bases his description on two specimens from the Fly River, south-eastern New Guinea, and disregards Peters' scale count on the sub-caudals. Peters' specimen had a low number of sub-caudal scales as did one of Thomson's specimens, which he states had a truncated tail.

The head of the Taipan (Oxyuranus scutellatus) showing the very large eye and nostril.
The word “Taipan” is the Cape York aborigines’ name for this snake. It is also known as the Giant Brown Snake and the MacLennan Brown Snake. It is an aggressive snake and, when annoyed, it raises one or two of its coils from the ground and flattens its neck laterally, as does the Green Tree Snake, instead of dorso-ventrally, as does the Tiger Snake. Its head flattens out to such an extent that the angle of the jawbones is distinctly seen. Instead of biting and holding on as do many of our venomous snakes, it snaps several times with lightning speed. The venom produced in great quantities by this snake is extremely potent. It is principally neurotoxic, but also destroys red blood cells and causes coagulation of the blood. The venom glands have a capacity of 400 milligrams of venom; that is, about 200 lethal doses. The large fangs, up to half an inch long, are frequently shed. This accounts for specimens having three or four fangs in place at the one time. The Taipan is not a bulky snake, but, like the common Brown Snake, is slender for its size. Its average length is six feet, but specimens up to eleven feet have been seen. The Taipan is usually regarded as being quite rare, but in the past few years many specimens have been seen and killed, and at certain places in northern Queensland this snake is quite common. It frequents open country on the lowlands and highlands of New Guinea and northern Queensland to as far south as Gladstone, and also occurs in the Northern Territory, as far west as the Darwin area.

The food of the Taipan seems to be the smaller mammals, such as rats, mice, and small marsupials. One of the few oviparous venomous snakes in Australia, the Taipan lays from three to eight eggs every year. The colour of this snake is from light to dark brown above with a pinkish tinge on the sides of the neck. Underneath it is white to creamy yellow, sometimes with brown or grey blotches.

Like many of our snakes, the Taipan is poorly represented in museums. Any reptiles which are killed without being mutilated would be much appreciated by museum authorities.

Scalation: Rostral broader than deep, nasal divided, 1 preocular, 2 postoculars, 6 supralabials, 7 infralabials. Frontal longer than broad, shorter than the parietals. Anal single, 21 or 23 rows of scales round the body. Subcaudals 48-78 divided. Ventral 230-243; the dorsal scales keeled. 1 or 2 small grooved teeth behind the fang.

References

NOTES ON SNAKE HIBERNATION
IN NEW SOUTH WALES
By A. I. Ormsby

The writer of these notes has long been intrigued by reports by Ditmars (1943) and Pope (1946) of mass hibernation of snakes in America, and in successive winters in this State since 1945 has searched consistently for such “snake dens”, but has at no time obtained evidence or information which would lead one to believe that mass hibernation exists in New South Wales.
The following personal observations of instances of snake hibernation have been made between April and September, which is the probable period of hibernation in and around Sydney:—

(a) *Dendrophis punctulatis* (the Green Tree Snake), near Waterfall, June, 1946. Two young snakes, 18 inches long, were taken separately from underneath a conglomeration of rocks around the roots of trees on a high ledge.

(b) *Demmansia psammophis* (the Whip Snake), at Kurnell, in June, 1946. A number of specimens were taken individually under sandstone rocks on top of a small flat hill in a sandy area. (Many other similar records.)

(c) *Denisonia nigrescens*, at Kurnell, in August, 1947. Several specimens were taken from underneath rocks well embedded about half-way up the hill referred to in (b) above.

(d) *Denisonia signata* (the Marsh Snake), near Newport, in July, 1951. Several specimens were taken from underneath flat iron flush with the ground on a hill in this area.

(e) *Pseudechis porphyriacus* (the Black Snake), near Woy Woy, in July, 1949. Six well-grown specimens (average nearly 5 feet) were taken from underneath a large slab of concrete about 12 feet square and 4 inches thick, formerly the base of an old farm shed. The snakes were reached by breaking the concrete with a crowbar. The slab was on a slight rise near a marsh in fairly open country and appeared to be the only suitable hibernation site in the vicinity.

The following general conditions were noted in all cases:—All snakes were taken in elevated, dry, well-drained surroundings. In only one instance, namely (e) above, were the snakes hibernating together. In this case it was very interesting to note that all six specimens were well grown, which was peculiar, in that these black snakes were very common in the vicinity and a very exhaustive search was made without any result for other hibernating places. This could perhaps be explained by the fact that this species, more than any other local species, has cannibalistic tendencies. In no case were different species found together.

It seems from the absence of all records to the contrary—and there is no doubt that such an event as the discovery of a large number of snakes in hibernation together would result in considerable publicity—our snakes normally hibernate separately and the presence together of more than one specimen is purely coincidental due to the hibernation site being so pre-eminently suitable as winter quarters. In this respect it is of interest to note that American snakes for the most part belong to the families Colubridae and Crotalidae, whereas all the records referred to above, with the exception of the Green Tree Snake, family Colubridae, refer to the family Elapidae, which is the predominant family in Australia.

From this it seems that conditions in temperate Australia may be distinguished from American conditions in that our winter being not so severe as in the United States, it is not necessary for snakes to find such a secure resting-place for the winter as a "den", and consequently there are many more places available for hibernation so long as the consistent factors of dry conditions and reasonable security exist.

The writer has, of course, received many other similar records of snakes hibernating from authentic sources, but the above five instances only have been quoted as personal observations and typical cases. For instance, the writer has frequently collected snakes of the family Typhlopidae (Blind snakes) under stones in the winter, but as these are burrowing snakes, it is unlikely that there is any extensive change in their habits during the winter. A very interesting report recently concerning the collection of five Green Tree Snakes under the roof of a house at Dee Why in June of last year.
probably is a good illustration of snakes choosing a pre-eminently suitable site for hibernation as in (e) above, but is still very far short of a mass hibernation. The writer has no local records concerning the Carpet or Diamond Snake, which is the only member of family Boidae found in this State, but from his observations of this species on the Atherton tablelands, Queensland, in the winter of 1943 formed the opinion that this snake is not particularly affected by cold weather, merely seeking sheltered surroundings, and certainly at no time did he find more than one specimen of this snake. Probably in this State this species hibernates much as any other species, refrains from feeding, but occasionally comes out on warm days.

The writer is, however, very anxious to obtain further reports on this most interesting matter of snake hibernation and would welcome any information from members or interested persons.

References

SOME NOTEWORTHY FISHES FROM EASTERN AUSTRALIA

By Gilbert P. Whitley, F.R.Z.S.
(Contribution from The Australian Museum, Sydney)
(Figs. 1-5)

In the course of ichthyological routine recently the following interesting records and new synonyms of eastern Australian fishes have come to my notice:

(1) Basket-work Eel, Diastobranchus danae (Bruun, 1937.) (Figs. 1 and 1a.)

Mr. M. Olsen, of the C.S.I.R.O., Hobart, forwarded a specimen of this remarkable eel to the Australian Museum (Regd. No. 1B.2707). It is an adult female, 4 feet long and 4½ lb. in weight, with many eggs, about 1.25mm. diam., in the oes, and had been taken in 100 fathoms, east of Maria Island, Tasmania, in July, 1951. New record for Australia and new size-record for its family, the Synaphobranchidae. It was dark chocolate to liver-brown in colour, darker along margins of fins, with violet tinge along dorsal fin; eye pale blue with paler, watery, opalescent iris. Slender, subdorsal scales in short rows almost at right-angles form a “basket-work” pattern on cheeks and body. More than 150 pores in 1 lat., of which 25 are before the vent. Head (6½ ins.) 7.5, depth (3½) 14 in total length (47). Eye (25mm.) 6.25 in head, or 2 in snout (50) and greater than the distance between the gill-slits below (23). Predorsal length, 15.6 inches; preanal, 12; pectoral fin, 3.7; gill-slit, 1.2. Interorbital, 22mm.; gape, 30. Dorsal origin behind level of vent. Gill-openings separated by a median thoracic bag. 

Drs. K. C. and J. L. Shellshear, of Sydney, kindly supplied X-ray films which showed: Br. 15; D.366; A.337; P.15; C.8 on each hypural, i.e., 16; and vertebrae 174.

This Tasmanian eel (Fig. 1) is evidently allied to the South African D. capensis Barnard, 1923, but appears to have the mouth extending less behind the eye and about half-way along the length of the head, more vertebrae, and more numerous enlarged teeth along vomer. It is apparently the adult of the larva named Synaphobranchus danae from east of New Zealand by Bruun (Dana Rept. ix, 1937, pp. 13 and 29, pl. i, figs. 1 and 3), whose figure is reproduced here as Fig. 1a, a glass eel which was associated with Diastobranchus by Norman and Trewavas in 1929.

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Figure 1. Basket-work Eel, Dieastobranchus damae. 1, adult female from Tasmania; 2, teeth on roof of mouth (lower jaw dotted); 3, scales; and 4, lower surface of head and body. G.P. W. del.

Figure 1a. Larval type of the Basket-work Eel, D. damae, 6⅛ ins. long, from east of New Zealand. After Beami.
(2) Sea-horse, *Hippocampus planifrons* Peters, 1877 (Fig. 2). When dredging in Moreton Bay with Mr. T. C. Marshall, I noticed a sea-horse with more evenly sloping profile and lower corona than that of *H. whitei* Bleeker, 1855, which we were obtaining at the same time. This was identified as *H. planifrons*, the Berlin Museum type of which I previously illustrated from Western Australia (Austr. Zool., ix, 1940, p. 414, Fig. 21), but it also became obvious that *H. dahli* Ogilby, 1908, was a new synonym of *planifrons*, and one of Ogilby's specimens (Austr. Mus., No. I.12523) from Moreton Bay, Queensland, is figured here to show the congruency. Family Syngnathidae.

![Figure 2.—Sea-horse, *Hippocampus planifrons*. From a Moreton Bay topotype of *H. dahli*.](image)

G.P.W. del.

(3) Silver Batfish, *Monodactylus argenteus* (Linne, 1758) (Fig. 3). Here figured from a juvenile, about 16 mm. or \( \frac{1}{4} \) in. long, the largest of which were netted in Sydney Harbour by officials of Taronga Park Aquarium (Austr. Mus., regd. No. IB. 2688). Unlike the adult, the young has prominent ventral fins, serrated preoperculum, dorsal spines free of scales, front of back scaleless, fin-rays all simple, and lateral line ending below soft dorsal fin. D. (iv procumbent), viii, 28; A. (i proc.), iii, 30. Colour mostly black. Snout, pectorals, margins and posterior rays of soft dorsal and anal fins and whole of caudal white. A whitish embayment below end of second dorsal and a similar one over the end of the anal unite in some specimens to form a white bar down the body isolating the black blotch over the caudal peduncle. Family Monodactylidae.

(4) Sweep, *Scorpius lineolatus* Kner, 1865. *Juvenella carangoides* Whitley (Rec. Austr. Mus., xxii, 1948, p. 90, Fig. 9) is the young of *Scorpius lineolatus*, so my generic and trivial names become synonyms of Kner's and Juvenellidae equals Scorpidae.

(5) Luderick, *Girella tricuspidata* (Quoy & Gaimard, 1824) (Fig. 4). This common New South Wales fish exhibits curious variations at times. In February, 1951, Mr. C. R. Adams caught a xanthistic female at Malabar, near Sydney, which was canary-yellow almost all over, except for a few scattered blotches or spots of dark grey (Austr. Mus., regd. No. IB. 2628). An almost entirely canary-yellow Luderick was caught at Malabar on 30th August, 1951, by Mr. F. Fincher (No. IB.2713). Xanthic abnormalities have been recorded in Victorian and Tasmanian freshwater eels (*Anguilla*) and in foreign rock-cods (*Scorpaenidae*), lampreys (*Petromyzon*) and certain loaches and carp-like fishes.

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Figured here is a Luderick, normal as to colour, but with abnormal soft bumps on head and near tail. It is a male, 21 inches long, from Bondi, near Sydney. (Austr. Mus., regd. No. 1B. 2482.)

(6) Rogue Fish, *Tetraroge darnleyensis* Alleyne & Macleay, 1877 = *leucogaster* (Richardson, 1848) (Fig. 5). Through the courtesy of Mr. J. R. Henry, Curator of the Macleay Museum, University of Sydney, I have been allowed to borrow the unique type of Alleyne & Macleay’s species for illustration here. It is 55 mm. long with eye 7 mm. and interorbital at least 3 mm.; Br. 6; D. xiii, 7; A. iii, 6; P. 16; V. i, 5 and 10 main caudal rays. About 15 tubes in l. lat. It is slightly shrivelled and all colours have faded. No barbels. Bands of villiform teeth on jaws, vomer and palatines; two nostrils on each side; deep temporal fossae. Gill-membranes free, last gill-cleft closed; about 8 short blunt gill-rakers on lower part of first arch. Body naked. Bases of ventral fins narrow and separated by narrow interspace. *T. darnleyensis* seems synonymous with *Apistus leucogaster* Richardson (Voy. Samarang, Fish., 1848, p. 5, pl. v, figs. 1-2) from the Sea of China. As *Gymnapistus leucogaster*, it has been figured in colour by Bleeker (Verh. Akad. Amst., xvi, 1876, pp. 10 & 84, pl. iv, fig. 1, and Atlas Ichth., ix, 1878, pl. cccxxi, fig. 6). Family Tetrarogidae.

(7) Deep Velvet Fish, *Kanekonia queenslandica*, sp. nov. A small fish, 1½ ins. long, from Albany Passage, north Queensland, which is like the figure (Tanaka, Fish. Japan, xxviii, 1918, p. 510, pl. 136, fig. 380) of *K. florida* Tanaka, 1915, but has a higher soft dorsal fin, shorter snout, and rounder tail. D. xii, 8; A. 9; P. 14; V. i, 3; C. 3, 11, 2. L. lat. 8 or 9. The head has smooth ridges which join to enclose a “honeycomb” of sunken areas. Head equal to depth, 2.3 in standard length (30mm). Eye (3.5) equal to snout and slightly exceeding interorbital. Colour light brown to yellowish; eye blue. Holotype, Austr. Mus., regd. No. IA.3742. Family Aploactidae.

Figure 3.—Young Silver Batfish, *Monodactylus argenteus*, from Sydney Harbour.
Figure 4.—Abnormal Luderick, *Girella tricuspidata*, from Bondi. New South Wales.

Photo.—H. Hughes.

Figure 5.—Rogue Fish, *Tetraroge leucogaster*. Type of *T. darnleyensis* from Darnley Island, Queensland. Show below are (left to right): Top of head, urinogenital openings, and left gill-covers.

G.P.W. del.
(8) Gurnard, Dixipichthys ferculum, sp. nov. An extraordinary little gurnard was picked up on Palm Beach, N.S.W., on October 1, 1951, by Mr. O. Best (Austr. Mus., regd. No. IB. 2718). It had two long horns diverging from the snout and two more reaching back from the occiput. It seems near Dixipichthys hoplites Fowler (Proc. U.S. Nat. Mus., 85, 1938, pp. 101 & 119, fig. 57), from the Philippines, except that the eye is in the posterior half of the head, the nasal and occipital spines (16 to 17 mm. long) are longer than the head without them (19 mm.), and it is yellowish-white with black spots instead of plain. The Palm Beach fish is less than 2 ins. long and slightly shrivelled so that formulae cannot be given; the pectoral reaches nearly to caudal peduncle, the interorbital is much sunken, there are no bony bucklers, and the general characters agree with D. hoplites. It might be the young of the Painted Gurnard, Pterygotrigla picta andertoni Waite, 1910, of which I have no specimens less than 7 ins. long for comparison, but I think this unlikely as considerable metamorphosis of the spines, alteration of shape, and development of bucklers would have to take place to liquidate their differences. Family Trigidae.

(9) Amongst the Flatheads (family Platycephalidae), I consider a few species to be synonymous and provide a new generic name for another.

The Tiger Flathead, originally called Platycephalus macrodon by Ogilby in 1885, is evidently synonymous with P. richardsoni Castelnau, 1872, the latter name, being earlier, prevailing as Neoptalycephalus richardsoni.

Platycephalus castelnaui was originally described inaccurately by Macleay in 1881; much later, when in Western Australia, I named Planipora melsomi (Austr. Zool. xi, 1945, p. 38), but the latter falls as a synonym of Planipora castelnau, emended.

Insidiator parulis McCulloch, 1914, is evidently a synonym of Platycephalus staigeri which may now be called Sugggrundus staigeri (Castelnau, 1875). For references, see Austr. Mus. Mem. v, 1930, pp. 400-403.

Cumbel, gen. nov. is proposed with orthotype, Platycephalus haackei Steindachner (Anz. Akad. Wiss. Wien xx, Oct. or later, 1883, p. 195; Sitzungs. Akad. Wiss. Wien 88, 1, 1883 (1884), p. 1081, pl. ii, figs. 2-2a) equals Cumbel haackei. It differs from Platycephalus in having the head about one-third total length; a small third preopercular spine; and rounded caudal fin.

Waite suggested that Platycephalus semermis De Vis, 1883, might refer to the same species; if so, haackei, being later, would become a synonym. It seems to me, however, that semermis is a synonym of cinereus Gunther, 1872.

The above records are the frugal rewards of many heuristic hours.

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NOTES AND NEWS

Visit by the “Galathea” Expedition.

The Danish Deep-Sea Expedition round the world in the naval frigate Galathea, under the leadership of the distinguished marine biologist, Dr. Anton Bruun, visited Sydney in November, and meetings were arranged between members of the expedition and members of the Royal Zoological Society for scientific and social enjoyment.

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OUR EXPLORERS' INSECTS

By KEITH McKEOWN, F.R.Z.S.

(Asst. Curator of Insects, Australian Museum)

In this Jubilee year, with public attention focussed on the exploration of Australia by re-enactments of Sturt's memorable journey down the Murrumbidgee and Murray Rivers and the first crossing of the Blue Mountains by Blaxland, Lawson and Wentworth, it may be interesting to look at the insects which attracted the attention of the explorers, and the effect which some, at least, of them may have had on their often hazardous journeys.

While Torres does not appear to have sighted the Australian mainland, he sailed through Torres Strait in September-October, 1606. In Prado's Relacion he tells of the naming of the Isles of Cantharides, because "so great was the number of flies they call cantharides that it seemed as if they wanted to eat the men up".

Possibly the first important reference is that of Francis Pelsart, when on 16th June, 1629, after his ship, the "Batavia", had struck on Houtman's Abrolhos, he and some of his crew, having crossed to the mainland in search of water, found "the country was flat and without vegetation or trees, with nothing in view but ant-hills, and these so high that they looked afar off like the huts of negroes, and at the same time they were so plagued with flies, and those in such multitudes that they were scarce able to defend themselves. . . ." This was the Europeans' first view of termite mounds, and their first experience of the persistent attentions of the little Bush Flies (Musca vetustissima), which were to arouse the wrath of many subsequent explorers. In 1688, the buccaneer Dampier made the first close acquaintance of the aborigines—and of the flies. He wrote: "Their Eyelids are always half closed, to keep the Flies out of their Eyes; they being so troublesome here, that no Fanning will keep them from coming to one's Face; and without the assistance of both Hands to keep them off, they will creep into one's Nostrils and Mouth, too, if the Lips are not shut very close". Eight years later, in 1696, Willem de Vlamingh, landing on the western coast, found that "in the daytime one is terribly tortured with the Flies".

1699 saw Dampier again visiting New Holland, and once more he noted "several things like Hay-cocks standing in the Savannah, which at a distance we thought were houses, looking just like the Hottentot's houses at the Cape of G. Hope; but we found them to be so many rocks". The savages here "were much the same blinking Creatures", and "(and here being also abundance of the same kind of Flesh-flies teizing them). . . . While we were about the Well we were sadly pester'd with the Flies".

With the discovery of the east coast of Australia by Capt. James Cook, in 1770, natural history observations became more exact and factual. Cook's expedition was accompanied by two first-rate naturalists, Mr. Banks and Dr. Solander, and this practice was followed with many subsequent voyages of discovery. In Cook's own journal he writes on his third voyage, at Adventure Bay, in January, 1777: "Insects, though not numerous, are here in considerable variety. Amongst them are grasshoppers, butterflies and several sorts of small moths, finely variegated. There are two sorts of dragon-flies, gad-flies, camel-flies; several sorts of spiders and some scorpions; but the last are rather rare. The most troublesome, though not very numerous tribe of insects, are the mosquitoes; and a large black ant [Myrmecia forficata], the pain of whose bite is almost intolerable during the short time it lasts. The mosquitoes make up the deficiency of their number by the severity of their venomous proboscis".

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In Sir Joseph Banks' journal, the insects observed receive more detailed attention. At Bustard Bay, on 23rd May, 1770, he tells how the men were afflicted by the bites of ants and by stinging caterpillars. "Fresh water we saw none", he writes, "but several swamps and bogs of salt water. In these, and upon the sides of the lagoons, grew many mangrove trees, in the branches of which were many nests of ants, of which one sort were quite green. These, when the branches were disturbed, came out in large numbers and revenged themselves very sufficiently upon their disturbers, biting more sharply than any I have felt in Europe. The mangroves had also another trap which most of us fell in. It was a small kind of caterpillar, green and beset with many hairs, numbers of which sat together upon the leaves, ranged by the side of each other, like soldiers drawn up; twenty or thirty, perhaps, on one leaf. If these wrathful militia were touched ever so gently, they did not fail to make the person offending sensible of their anger, every hair in them stinging much as nettles do, but with a more acute, though less lasting smart". The ants were the Green Tree Ant (Oecophila virescens), which forms large nests of green leaves among the branches of the trees. Of them Banks has more to say at a later date. This is the first record of trouble with ants, which in later years was to become almost a "theme song" of some explorers in the interior of the continent.

Elsewhere in his journal, Banks has more to say about these pestilent insects. He tells how, "Of insects there were but few sorts, and among them only the ants were troublesome to us. Mosquitoes, indeed, were in some places tolerably plentiful, but it was our good fortune never to stay at any time in such places. The ants, however, made ample amends for the want of the mosquitoes; two sorts in particular, one green as a leaf and living upon trees, where it built a nest, in size between that of a man's head and his fist, by bending the leaves together and gluing them with whitish paper substance which held them firmly together. In doing this their management was most curious: they bend down four leaves broader than a man's hand and place them in such a position as they choose. This requires a much larger force than these animals seem capable of; many thousands indeed are employed in the joint work. I have seen as many as could stand by one another, holding down such a leaf, each drawing down with all his might, while others within were employed to fasten the glue. How they had bent it down I had not an opportunity of seeing, but that it was held down by main strength, I easily proved by disturbing a part of them, on which the leaf, bursting from the rest, returned to its natural situation, and I had an opportunity of trying with my finger the strength that these little animals must have used to get it down. But industrious as they are, their courage, if possible, excels their industry; if we accidentally shook the branches on which a nest was hung, thousands would immediately throw themselves down, many of which falling upon us made us sensible of their stings and revengeful dispositions, especially if, as was often the case, they got possession of our necks and hair, their stings were by some esteemed not much less painful than those of a bee; the pain, however, lasted only a few seconds.

"Another sort there were, quite black, whose manner of living was most extraordinary. They inhabited the inside of the branches of one sort of tree, the pith of which they hollowed out almost to the very end of the branches; nevertheless, the tree flourished as well to all appearances as if no such accident had happened to it. When first we found the tree, we, of course, gathered the branches, and was surprised to find our hands instantly covered with legs, and of these small animals who stung most intolerably; experience, however, taught us to be more careful for the future.

"... A third sort nested inside the root of a plant which grew upon the bark of trees in the same manner as mistletoe. The root was the size of a large turnip, and often much larger; when cut, the inside showed innumerable winding passages in which the animals lived. The plant itself throve to all appearances not a bit the worse for its numerous inhabitants. Several hundreds have I seen, and never one but was inhabited, though some were
so young as not to be much larger than a hazel nut. The ants themselves were very small, not above half as large as our red ants in England: they sting, indeed, but so little that it was scarcely felt. The chief inconvenience in handling the roots came from the infinite number; myriads would come in an instant out of many holes, and running over the hand tickle so as to be scarcely endurable. . . ."

Termites, too, did not escape Banks’ attention. Although noting their similarity to “white ants,” he tended to associate their large nests with those of a species of “true” ant. On the Endeavour River, 28th June, 1770, he recorded that, “We have ever since we have been here observed the nests of a kind of ant, much like the white ant in the East Indies, but to us perfectly harmless: they were always pyramidal, from a few inches to six feet in height, and very much resembled the Druidical monuments which I have seen in England. To-day we met with a large number of them of all sizes ranged in a small open place which had a very pretty effect. Dr. Solander compared them to the runic stones on the plains of Upsala, in Sweden; myself to all the small Druidical monuments I had seen”. Later in his journal reference is again made to these nests, where, in discussing the true ants, he writes: “The fourth kind were perfectly harmless, at least they proved so to us, though they resembled almost exactly the white ants of the East Indies, the most mischievous insect known in the world. Their architecture was, however, far superior to that of any other species. They had two kinds of houses—one suspended in the branches of trees, the other standing upright on the ground. The first sort were generally three or four times as large as a man’s head; they were built of a brittle substance seemingly made from small parts of vegetables kneaded together with some glutinous matter, probably afforded by themselves. On breaking this outer crust, innumerable cells appeared full of inhabitants, winding in all directions, communicating with each other, as well as with divers doors which led from the nest. From each of these an arched passage led to different parts of the tree, and generally one large one to the ground. This, I am inclined to believe, communicated with the other kind of house, for the animals inhabiting both were precisely the same; I see no reason why they should be supposed, contrary to every instance that I know in Nature, to build two different kinds of houses, unless, according to the season, prey, etc., they inhabited both equally.

“The second kind of house was very often built near the foot of a tree, on the bark of which their covered ways, though but seldom the first kind of house, were always to be found. It was formed like an irregularly-sided cone, and was sometimes more than six feet high and nearly as much in diameter. The smaller ones were generally flat-sided and resembled very much the old stones which are seen in many parts of England, and supposed to be the remains of Druidical worship. The outer coat of these was two inches thick at least, of harder, well-tempered clay, under which were their cells; to these no doors were to be seen. All their passages were underground, where probably they were carried on till they met the root of some tree, up which they ascended and so up the trunks and branches by the covered ways before mentioned. These I should suppose to be the houses to which they retire in the winter season, as they are undoubtedly able to defend them from any rain that can fall, while the others, though generally built under the shelter of some overhanging branch must, from the thinness of the covering, be but a slight defence against a heavy rain”.

From the description, the smaller “flat-sided” nests suggest those of the Meridional Termite (Hamitermes meridionalis). Banks’ speculations concerning the summer and winter homes of the insects are at fault, each type of nest being constructed by a different species; he also badly misjudged the ability of the termite nests to withstand heavy rain. It is perhaps with relief that Banks concludes his account of the ants in these words: “Thus much for the ants, an industrious race which in all countries have for
that reason been admired by man, though possibly in no country more
admirable than in this. The few observations I have written down con-
cerning them are chiefly from conjecture, and therefore are not at all to be
depended upon. Were any man, however, to settle here who had time and
inclination to observe their economy, I am convinced that it would far
exceed that of any insects we know, not excepting our much-admired bees”.

The only other insect referred to in detail by Banks is a butterfly
(Danaida melissa hamata), observed at Thirsty Sound, on 29th May, 1770.
Banks wrote: “Insects in general were plentiful, butterflies especially. With
one sort of these... the air was for the space of three or four acres
crowded to a wonderful degree; the eye could not be turned in any direction
without seeing millions, and yet every branch and twig was almost covered
with those that sat still. Of these we took as many as we choose, knocking
down with our caps, or anything that came to hand. On the leaves
of the gum-trees we found a pupa or chrysalis, which shone as brightly as
if it had been silvered over with the most burnished silver, which it per-
fectly resembled. It was brought on board, and the next day came out
into a butterfly of a velvet black changeable to blue; the wings, both
upper and under, were marked near the edges with many brimstone-
coloured spots, those of the under wings being indented deeply at each end.”
Similar gregarious habits have been observed for Danaida hamata
by modern scientists and naturalists; the second butterfly mentioned was
a species of Euploea.

I have quoted Banks at some length in view of the variety and interest
of his observations.

In August, 1791, the French Government despatched two ships, the
“Recherche” and the “Esperance”, under the command of d’Entrecasteaux,
to search for the missing La Perouse; with the expedition, as naturalist,
was Jacques Labillardiere. They reached Tasmania in April, 1792, and
here Labillardiere witnessed a “lady” devouring game from her own head!
“We observed with disgust”, he tells, “that like most of the blacks, she
churned these filthy insects between her teeth and then swallowed them”. Few insects, in Tasmania, seem to have come under his notice, but he
tells how, at Port d’Entrecasteaux, 13th May, 1792, “I was obliged to make
great haste in preparing the skins of the birds which I wished to preserve;
for the flesh, when exposed to the air, very soon became full of small living
larvae, deposited in it by a fly of a reddish brown colour, which is viviparous
like that of our country, known by the name of musca carnaria.
These larvae accelerate the putrefaction of flesh in a surprising manner.”
And at Rocky Bay, 24th January, 1793, “In the woods we found few in-
sects; but for this we were amply compensated when we returned to the
seaside. As the weather was very fine, the insects had flown thither from
all parts and among the great number of these that had attempted to cross
the bay, many termites, and various coleoptera, of very strange shapes.
The wind had driven them upon the sand, where we could collect them
with great ease”. At Esperance Bay, on the western mainland, d’Entre-
casteaux complained that “The mosquitoes fatigued me much. The species
were the Musca domestica, the Stomoxys irritans and the Culex pipiens of
Fabricius”.

Eight years later, the distinguished French naturalist, Francois Peron,
accompanied the ships” “Geographe” and “Naturaliste” on a surveying expedi-
tion around our coasts. On 31st May, 1801, the ships entered Geographe
Bay, and the next day Peron with a large party went ashore, but, “Insects
even seemed exiled from these parts, always excepting ants, whose black
legions, particularly on the slopes of the dunes, were everywhere as innumer-
able as they were disagreeable. I recognised several new species among them,
of which one, remarkable for its great size, closely resembles the Formica
gracilis of Fabricius; but the account of these animals will be treated more
in detail in another part of my works”. Unfortunately, Peron did not live
to write this portion of his work. The ant was one of our unique Bulldog Ants (Myrmecia), a group of which more will be heard in the story of our exploration.

Following the "Geographe" and "Naturaliste" came the French ship "Uranie". An account of the voyage by Arago tells that when the expedition visited Peron Peninsula, W. Australia, in September, 1818, "I was attacked by such a prodigious number of flies, assailing my eyes and my mouth, that I had all the difficulty in the world to protect myself against them". He adds, graphically, "The sun sets; everything is dead. The myriads of flies that devoured us have disappeared; no insect wings through the air... The sun reappears, the air is again peopled".

The coastal surveys of Captain Phillip P. King, in 1817, 1819 and 1820, were rich in scientific results, but the journals contain little, among the references to natural history, about the insects. On the third voyage, while at Careening Bay, "Small lizards, centipedes and scorpions were numerous about our encampment; and the trees and bushes about the tents were infested by myriads of hornets and other insects, particularly mosquitoes and small sand flies, which annoyed us very much in the evenings".

King also noted at Cleveland Bay, 16th June, 1819, great swarms of butterflies: "Here, as well as at every other place that we had landed upon within the tropic, the air is 'crowded' with a species of butterfly, a great many of which were taken. It is doubtless the same species as that which Captain Cook remarks as so plentiful at Thiristy Sound... The numbers seen by us were indeed 'incredible'; the stem of every grass-tree, xanthorrhoea, which plant grows abundantly upon the hills, was covered with them, and on their taking wing the air appeared, as it were, in perfect motion'.

"It is a new species and is described by my friend, Mr. W. S. Macleay, in the appendix, under the name of Euploea hamata".

When the tide of exploration turned from the coastal regions to the inland areas, insects of new types were encountered, but the old enemies, ants, mosquitoes and sand-flies still attacked the travellers, and added to the trials and hazards of their journeys, the foremost being the ants, which, in the desert areas, may even at times have jeopardised the prospects of success or even of survival.

Among these explorers of the inland was Major (later Sir) Thomas Mitchell, who led parties to the Macintyre River, in 1831-2; to the Darling River, in 1835, and to the Darling and Murray Rivers, in 1836. He tells in his journal, 26th December, 1831, that "Amongst the objects which in this country were quite new to me were the insects continually buzzing about my tent. Of these a fly as large as a small bee, and of a rich green and gold colour, being a species of stilbum, occasionally surprised me with a hum almost as musical as the tones of an Eolian harp. But the habits of the bees there are not the least remarkable, judging from a singular circumstance that occurred respecting my rifle, for I found that a quantity of wax and honey had been deposited in the barrel, and also in the hollow part of the ramrod. I had previously observed one of the bees occasionally enter the barrel of the piece, and it now appeared that wax and honey had been lodged immediately above the charge to a depth of about two inches. The honey was first perceived in the hollow part of the ramrod, and although the empty double-barrelled gun lay beside the rifle, neither wax nor honey was found in either of its tubes. The bee which I frequently observed about my tent was as large as the English bee and had no sting."

The "species of stilbum" was, of course, one of the metallic Cuckoo-wasps, which are parasites in the nests of the Mason Wasps. The intruder in the gun-barrel is, however, a mystery; its behaviour is reminiscent of one of the smaller Mason Wasps, but these insects do not produce "wax and honey", but stock their cells with the paralysed bodies of small prey as food for their grubs.
Mitchell's description of the spiders met with on 18th January, although not entomological in the strict sense, may be quoted here. He writes: "The character of the spiders was very strange; and it seemed as if we had arrived in a new world of entomology. The spiders resembled an enamelled decoration, the body consisting of a hard shelly coat of dark blue colour, symmetrically spotted with white, being nearly circular, and armed with six sharp projecting points". This spider was one of the "Spiny-bellied" Spiders (Gasteracantha), which are gems of Arachnid beauty.

On 27th January, 1832, Mitchell notes: "This morning my attention was drawn by a noise resembling the growl of a dog, when I perceived a black insect nearly as large as a bird, carrying something like a grasshopper, with which it alighted and disappeared in a hole. On digging, it suddenly arose from the dust and escaped; but we found there various large larvae; this was the largest insect I had seen. A beautiful species of stilbum frequently visited my tent; its buzz, having two distinct notes, had a very pleasing sound. . . ."

The black insect was, without doubt, one of the large Sand-wasps, which excavate burrows in the soil, and stock them with the paralysed bodies of grasshoppers and other insects. Without casting too great doubt on the Major's veracity, it must be suggested that the size of the insect was greatly enhanced by his excitement in the chase. None of these insects, in any way, aspires to the size of a "bird"—even a small one!

An incident, which occurred on 3rd February, makes amusing reading—although, it may be doubted that Mitchell saw anything amusing about it. "On entering the wood beyond", he writes, "a sudden extreme pain in my thigh made me shout before I was aware of the cause: a large insect had fastened itself upon me, and on looking back, I perceived Souter, 'the Doctor', endeavouring to defend himself from several insects of the same kind. He told me that I had passed near a tree on which their nest was suspended; and it appeared that this had been sufficient to provoke the attack of these saucy insects, who wore the largest stings I had ever seen. The pain I felt was extreme, and the effect so permanent that when I alighted in the evening, on that leg from my horse, not thinking of the circumstances, I fell to the ground, the muscles having been generally affected. The wound was marked by a blue circular spot, of the size of a sixpence, for several months".

An alleged example of these "saucy insects" was secured, and was subsequently named Abispa australasiae, but this is one of the solitary clay-working Mason Wasps—so the identity of the insect must be sought elsewhere. Mitchell's description closely fits, in every way, the aggressive behaviour of one of the Paper-nest Wasps (Polistes)—warlike insects, which require little or no provocation to attack fiercely and painfully those who heedlessly venture near their nest.

On 15th February, "The rain poured from a sky that might have alarmed Noah", and "ground crickets of an undescribed species—which perhaps may be called Gryllotalpa australis—came out of the earth in great numbers".

As the expedition approached the Bogan River, "We were now in a 'land flowing with honey', for the natives with their new tomahawks extracted it in abundance from the hollow branches of the trees, and it seemed that, in the season, they could find it almost everywhere. To such inexpert clowns, as they probably thought us, the honey and the bees were inaccessible, and indeed invisible, save only when the natives cut it out and brought it to us in little sheets of bark, thus displaying a degree of ingenuity and skill in supplying their wants which we with all our science could not hope to attain. They would catch one of the bees and attach it to, with some resin or gum, the light down of the swan or owl; thus laden, the bee would make for the branch of some lofty tree and so betray its home of sweets to its keen-eyed pursuers, whose bee-chase presented indeed a laughable scene".
In contrast to the attention paid to the insect life of the country on the first expedition, the journal of the second contains only one reference of general interest; this concerns the strange nest of an ant, the identity of which, so far as I am aware, has not satisfactorily been settled. "The work of an ant peculiar to that country has also attracted attention", Mitchell writes, when near the Darling River. "Instead of an ant-hill, the habitation of these insects is made under a portion of the surface, which to the extent of about six feet in diameter appears quite smooth, level and clean, as if swept. This kind of surface was, to us on first advancing into the interior, one of its wonders. The ants render this nearly as hard as stone, reserving access through it by one or two small holes only. Thus they dwell securely at some depth below, for nothing less than a pick-axe could penetrate to the larvae, which in ant-hills of the common kind are eaten by the native females and children, who carry wooden shovels for the purpose of digging them out".

Compared to Mitchell's sometimes lively interest in the insects encountered, Sturt makes little reference to them, except on such occasions as they literally forced themselves upon his notice. In the journal of his expedition to the Macquarie River in 1828 and 1829, he tells how, while in the Macquarie Marshes: "We found it unsufferably hot and suffocating in the reeds, and were tormented by myriads of mosquitoes. . ."; and, again, while about sixty miles from the Macquarie, "we were previously tormented by the mosquitoes", and, once more, near Oxley's Tableland they found water and tethered their horses near it for the night, "and should have been tolerably comfortable had not the mosquitoes been so extremely troublesome. They defied the power of smoke and annoyed me so much that, hot as it was, I rolled myself in my boat cloak, and perspired in consequence to such a degree that my clothes were wet through, and I had to stand at the fire in the morning to dry them". The persecution of the mosquitoes becomes almost a "theme song"—and if it was not mosquitoes, it was kangaroo-flies. These are curious flat-bodied Louse-flies which infest kangaroos, and, when these animals are shot, leave their cooling bodies to crawl over the hunters. Those of Sturt's experience did not, however, follow their usual procedure. Near New Year's Creek, he tells how: "Our camp was infested by the kangaroo fly, which settled upon us in thousands. They appeared to rise from the ground, and as fast as they were swept off were succeeded by fresh numbers. It was utterly impossible to avoid their persecution, penetrating as they did into the very tents.

"The men were obliged to put handkerchiefs over their faces and stockings upon their heads; but they bit through everything. It was to no purpose that I myself shifted from place to place; they still followed, or were equally numerous everywhere. To add to our discomfort, the animals were driven almost to madness, and galloped to and fro in such a furious manner that I was apprehensive some of them would have been lost. I never experienced such a day of torment; and only when the sun set did these little creatures cease from their attacks.

"It will be supposed that we did not stay to subject ourselves to another trial; indeed, it was with some degree of horror that the men saw the first light of morning streak the horizon. . ."

"Although we had left the immediate spot at which the kangaroo flies (cabarus) seemed to be collected, I did not expect that we should have got rid of them so completely as we did. None of them were seen during the day; a proof that they were entirely local. They were about half the size of a common house fly, had flat brown bodies, and their bite, although sharp and piercing, left no irritation after it".

On his historic journey down the Murrumbidgee and Murray Rivers, such insect plagues were either absent or Sturt's attention was confined to other matters, for they receive no mention.
During the years 1837 to 1839, the spotlight of exploration swings from the eastern side of the continent to the west and north-west, where George Grey was struggling against thirst, hunger and other hardships. Here we find reference to the Barde, the fleshy larva of the Longicorn Beetle (Bardistus cibarius), which was an important food of the aborigines. Grey tells how, “Generally speaking, the natives live well... I have found the sorts of food vary from latitude to latitude... for example, in the southern parts of the continent the Xanthorrea affords an inexhaustible supply of fragrant grubs, which an epicure would delight in, when once he has so far conquered his prejudices as to taste them; whilst in proceeding to the northward, these trees decline in health and growth, until about the parallel of Gantheaume Bay they totally disappear, and even a native finds himself cut off from his ordinary supplies of insects...” Later, he tells more of this grass-tree dweller. “The grubs are white, have a fragrant aromatic flavour, and form a favourite article of food amongst the natives. They are eaten either raw or roasted, and frequently form a sort of dessert after native repasts. The presence of these grubs in a grass-tree is thus ascertained. If the top of one of these trees is observed to be dead, the natives give it a few sharp kicks with their feet, when, if it contains any Barde, it begins to give way; if this takes place, they push it over, and breaking the tree in pieces with their hammers, extract the Barde.” The adults were eaten as readily as their larval and pupal states. Although insect specimens were secured for later description by entomologists, mosquitoes paid the party their usual unwelcome visits, while “In other parts rose the gigantic ant-hills—so much spoken of by former visitors of these shores...” or he ‘laid awake, listening to the cries of the sea-birds and watching the brilliant fire-flies moving about in the dark foliage of the trees’.

Grey writes feelingly, while at Hanover Bay, in December, 1836, of the pestilent little Bush-flies, the bane of earlier visitors to the west. “To sleep after sunrise was impossible”, he writes, “on account of the number of flies which kept buzzing about the face. To open our mouths was dangerous—in they flew, and mysteriously disappeared, to be rapidly ejected again in a violent fit of coughing; and into the eyes, when unclosed, they soon found their way, and by inserting the proboscis, and sucking, speedily made them sore; neither were the nostrils safe from their attacks, which were made simultaneously on all points and in multitudes. This was a very troublesome annoyance, but I afterwards found it to be a very general one throughout all the unoccupied portions of Australia; although in general the further north you go in this continent, the more intolerable does the fly nuisance become”. While in the same locality, he tells, with little concealed amusement, of an encounter with the Green Tree Ants, which, on the eastern coast, had already impressed Captain Cook’s party by their pugnacity. “The thickness of the vegetation made it difficult to force a way through, and whenever in attempting so to do, a tree was shaken, numbers of a large green sort of ant fell from the boughs on the unhappy trespasser, and making the best of their way to the back of his neck, gave warning by a series of most painful bites that he was encroaching on their domain. Yet it was sometimes ludicrous to see one of the party momentarily stamping and roaring with pain as he cried out to a companion to hasten and assist him in getting rid of an enemy at once so diminutive and so troublesome”.

Edward John Eyre, in the years 1840-41, also suffered from the attentions of the ubiquitous Bush-flies, and, when approaching Lake Torrens, in August, 1840, we find him writing of them: “The flies were also incessant in their persecuting attacks. What with flies and dust and indisposition, I scarcely remember to have spent a more disagreeable day in my life. My eyes were swollen and very sore, and altogether I was scarcely able to attend to anything or employ myself in any profitable way”. Later, near Fowler’s Bay, in February, 1841, this torment was exchanged for another—that of large blood-sucking March-flies (Tabanidae): “For the
last few days", he writes, "the weather had been tolerably cool, and we had not been much troubled with mosquitoes; instead, however, we were per-secuted severly by a very large greyish kind of horse-fly, with a huge proboscis for sucking up the blood. These pests were in great numbers, and proved a sad annoyance, lighting upon us in every direction and inflicting very irri-tating wounds even through clothes of considerable thickness"; and again in March, "The large flies were also very numerous, troublesome and irritating tormentors. They literally assailed us by hundreds at a time, biting through our clothes and causing us constant employment in endeavouring to keep them off. I have counted twenty-three of these blood-suckers at one time upon a patch of my trousers eight inches square".

The added strain upon already sorely tried explorers, caused by the persistent attacks of insects, must be experienced to be fully realised. It seems possible that, at critical times, the success or failure of an exploring party may have been influenced by insects. Commander J. Lort Stokes, during his survey of the coasts of Australia in H.M.S. "Beagle", during the years 1837 to 1843, was, like so many before and after him, beset by the Bush-flies. After quoting Dampier's remarks on the pest, he continues: "We found constant occasion, when on shore, to complain of this fly nuisance; and when combined with their allies, the mosquitoes, no human endurance could, with any patience, submit to the trial. The flies are at you all day, crawling into your eyes, up your nostrils, and down your throat, with the most irresistible perseverance; and no sooner do they, from sheer exhaustion, or the loss of daylight, give up the attack than they are relieved by the mosquitoes, who completely exhaust the patience which their predecessors have so severely tried. It may seem absurd to my readers to dwell upon such a subject; but those who, like myself, have been half-blinded, and to boot, almost stung to death, will not wonder that even at this distance of time and place I recur with disgust to the recollection".

Stokes next turns his pen upon their "mosquito" tormentors: "Procuring the necessary observations completed the duties of the day", he writes, "but, alas! the sleep all could have enjoyed so much after our work was rendered impossible by the swarms of mosquitoes, who at sunset relieved those of their tribe upon whom the day duty had developed, and commenced a most unsparing attack upon us: all devices to escape them were tried in vain, and some of the men were really half mad with the insufferable annoyance. . . ."

And, again, "I must be pardoned for again alluding to our old enemies the mosquitoes, but the reception they gave us this night [March 9th, 1838] is too deeply engraven on my memory to be ever quite forgotten. They swarmed around us, and by the light of the fire, the blanket bags in which the men sought to protect themselves, seemed literally black with their crawling and stinging persecutors. Woe to the unhappy wretch who had left unclosed the least hole in his bag; the persevering mosquitoes surely found it out, and as surely drove the luckless occupant out of his retreat I noticed one man dressed as if in the frozen north, hold his bag over the fire till it was quite full of smoke, and then get into it, a companion securing the mouth over his head at the apparent risk of suffocation; he obtained three hours of what he gratefully termed comfortable sleep, but when he emerged from his shelter, where he had been stewed up with the thermometer at 87 degrees, his appearance may easily be imagined.

“Our hands were in constant requisition to keep our tormentors from the face and ears, which often received a hearty whack, aimed in the fruitless irritation of the moment at our assailants, and which sometimes ended in adding headache to the list of annoyances. Strike as you please, the ceaseless humming of the invincible mosquito close to your ear seems to mock his unhappy victim!

“One poor fellow, whose patience was quite exhausted, fairly jumped into the river to escape further persecution".

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Later, while still on the Fitzroy River, Stokes made a discovery: "It was this, and I mention it, as the hint may be useful to others: I found our enemies the mosquitoes did not resort to the higher portions of the tree, and that by climbing some thirty feet from the ground, a night's repose, or at least a night undisturbed by their attacks might be obtained".

This was, however, not the end of the mosquito trouble, but now Stokes attributes some good to their persecution. He tells how, "One of the officers on a shooting excursion lost his way and got entangled in a mangrove forest, where . . . fatigue hastened by thirst, at length quite knocked up my shipmate, who threw himself exhausted on the ground. In vain did he seek for a little rest, for no sooner was he quiet than swarms of mosquitoes assailed him, and forced him again on his legs; unwelcome as these tormenting visitors generally are, they were probably in this case the means of saving my friend's life, as goaded on by their unceasing attacks, to exertions otherwise out of the question, he eventually reached assistance, and was brought on board in a most helpless condition".

At Port Essington observations were made on the habits of the beautiful little Sugar Glider (Petaurus breviceps), which "is a great enemy to the wild bee, devouring them and their nests; the bees the natives discover by tapping the tree and listening for a buzzing from within. Those we saw, amounting to nearly a hundred, were about the size of a fly, of a dusky black colour, and strange to say, were hovering round an empty tar-barrel. They have been unsuccessfully tried in hives at Sydney". This attempt at domestication of the little Native Bee (Trigona) does not appear to have been recorded elsewhere.

Like so many travellers in the north of the continent, the officers and men of the "Beagle" did not escape the attentions of the Green Tree Ants. On Melville Island, "Whilst taking a few angles near the cliffs, we suddenly experienced a series of severe bites or nipping in several parts of our body, and looking round to discover when arose this unexpected attack, found ourselves under a tree covered with large green ants. Their bites were exceedingly painful, and it was only by beating and tearing off our clothes that we could rid ourselves of these unwelcome visitors. From a distance our appearance must have been sufficiently amusing. One moment soberly intent upon our duties, and the next jumping like madmen, and hastily stripping off our garments. The name of Ant Cliffs records our visit to the south shores of Melville Island. . . ."

On 7th July, 1841, the "Beagle" approached Sweers Island: "Previous to landing, the whole island appeared to be perfectly alive with a dense cloud of small flying animals, which, on our reaching the shore, proved to be locusts in countless numbers, forming a complete curtain over the island. They rose from the ground in such prodigious flights at each foothold that we were absolutely prevented from shooting any of the quails with which the island abounds. This annoyance, however, was only experienced for the first day or two, as the locusts winged their flight to Bentinck Island, leaving the trees only laden with them; out of these they started, when disturbed, with a rushing noise like surf on a pebbly beach". At this distance in time, it is not possible to identify these insects, but they were certainly a gregarious species of locust (Acrididae).

It is somewhat remarkable to find, on turning to Ludwig Leichhardt's journal of his expedition from Moreton Bay to Port Essington, in 1844-45, to find but few references to insects—a feature all the more striking in view of his constant and often petulant complaints. The Bush-flies, mosquitoes and sandflies receive only passing mention, and even these comments show remarkable restraint of expression in the circumstances. "The mosquitoes were a little troublesome after sunset and in the early part of the night", he writes, "but, after that time, it was too cold for them. The flies were a much greater nuisance; at times absolutely intolerable, from
the pertinacity with which they clung to the corners of our eyes, to the lips, to the ears, and even to the sores on our fingers'. Such were the conditions near the Mackenzie River, on 2nd January, 1845; and although a similar state of affairs probably prevailed for the greater part of the journey, it is not until 23rd July that we read, "We were never so much troubled by swarms of flies as during the last two days; it was impossible to get rid of them by any means'. Of the biting, night pests, Leichhardt writes briefly, while near the Palm Creek swamps: "We were very much annoyed and harassed, during the evening and the early part of the night, by sand-flies and mosquitoes; but the clear night grew so cold that these great enemies of bush comforts were soon benumbed".

Near Robinson's Creek, "The nests of the white ant were rarely seen; but the soldier ant, and the whole host of others, were everywhere. The funnel ant digs a perpendicular hole in the ground, and surrounds the opening with an elevated wall, sloping towards like a funnel; the presence of this insect generally indicates a rotten soil, into which horses and cattle sink beyond their fetlocks. . . . The "soldier ant" is almost certainly a Bulldog Ant (Myrmecia), but the identity of the "funnel ant" is obscure.

Wasps receive fairly frequent mention in the journal, and following the last quotation, he writes of Paper-nest Wasps (probably Polistes tepidus): "Large hornets of a bright yellow colour, with some black marks, made their paper nests on the stems of trees, or suspended them from the dry branches; most of us were several times severely stung by them. When found near our campment we generally destroyed them by quickly raising a large fire with dry grass". On the Calvert, "Great numbers of large bright yellow hornets, with some black marks across the abdomen, visited the water. Flies were exceedingly troublesome: but the mosquitoes annoyed us very rarely, and only where water was very abundant".

Termite nests, somewhat strangely, excited Leichhardt's interest but little, and receive only passing notice. On the Perry River, "Whenever we passed through open Vitex scrub, with its stiff loamy soil, we were sure of meeting a great number of the conical constructions of the white ant: they were from one to three feet high, very narrow, and tapering to a sharp point". And again, shortly afterwards, "I followed the Casuarina Creek up to its head, and called it "Big Ant-hill Creek", in consequence of numerous gigantic strangely buttressed structures of the white ant, which I had never seen of such a form and of so large a size".

As with previous explorers in the north, the Green Tree Ant made its presence felt in its typical manner: "It was at the lower part of the Lynd that we first saw the green-tree ant, which seemed to live in small societies in rude nests between the green leaves of shady trees. The passer-by when touching one of these nests, would be instantaneously covered with them, and would soon be aware of their presence by the painful bites they are able, and apparently most ready, to inflict".

It is somewhat unusual to find, among references to so many insects of an, at least, annoying nature to read that "immediately after sunset, the chirping of several kinds of crickets was generally heard, the sound of which was frequently so metallic as to be mistaken for the tinkling of our bell". These insects were encountered in the vicinity of Kirchner's Range, and would seem to have been a species of mole cricket (Gryllotalpa), which has a churring, bell-like note. At Snowdrop's Creek, Leichhardt tells of the little native bees (Trigona), which "came like flies on our hands, on my paper and on our soup plates, and indicated abundance of honey; a small species of Cicada had risen from its slumbers and was singing most cheerfully".

A magnificent locust—or short-horned grasshopper (Petasida ephippigera), found near the South Alligator River, is illustrated, and of it Leichhardt writes: "Whilst on this expedition we observed a great number of grasshoppers, of a bright brick colour dotted with blue: the posterior
part of the corselet and the wings were blue; it was two inches long, and its antennae three-quarters of an inch".

A brief mention of "a large green-eyed horse-fly, which was extremely troublesome to us, and which scarcely allowed our poor animals to feed" completes the references to the insects observed on this expedition.

It is rather remarkable that Sir Thomas Mitchell, in his Journal of an Expedition into the Interior of Tropical Australia (1848), has so little to remark concerning the insects, especially as his botanical notes are both frequent and detailed. On 5th April, 1846, he records how "in the scrub I passed through, in my ride, I found a Casuarina, indeterminable in the absence of flowers or fruit. It produces a gall as large as a hazel nut". It was probably one of the Coccid galls, of the genus Frenchia, which are not infrequently found on these trees. One species resembles a hazel nut surrounded by bract-like scales around the base. While still on the Balonne, "A very remarkable whiteness appeared on the leaves of the Eucalyptus populifolius, which, on very close examination, appeared to be the work of an insect". In a footnote, J. O. Westwood remarks that "It is an extremely beautiful production, quite unlike anything I have yet seen, and is, I have no doubt, the scale of a coccus", but few remains—unidentifiable—insects could be found. In the light of our present knowledge it would appear that it was the sugary covering of one of the lerp insects (family Psyllidae) which so often thickly cover the leaves of eucalypts.

On 22nd September the members of the expedition encountered an extremely small species of native bee (Trigona) of which Mitchell writes: "The bees were also new to Yuranigh, who drew my attention to their extreme smallness; not much exceeding in size a knat or mosquito. Nevertheless, he could cut out their honey from hollow trees and thus occasionally procure for us a pleasant lunch, of a waxy compound, found with the honey, which in appearance and taste much resembled fine gingerbread. The honey itself was slightly acid, but clear and fine flavoured".

After reading the accounts of the journeys of other Australian explorers, one is inclined to imagine that the members of Mitchell's expedition were comparatively free, at least, from the persecutions of flies and mosquitoes. The only record of this nature is on 5th-9th November, near the end of the journey, when Mitchell writes: "In the meanwhile, I continued to finish maps and drawings, although suffering much inconvenience from excessive heat under a tent infested with numerous flies".

The entomological references in Captain Charles Sturt's "Narrative of an Expedition into Central Australia", although few are of exceptional interest.

When in the neighbourhood of Cawndilla, in October, 1844, Sturt describes the method used by the natives to secure the larvae of one of the large wood-moths—possibly a species of Trictena—which form one of their foods. He writes: "... their greatest delicacy being the large caterpillar (laabika), producing the gum-tree moth, an insect they procure out of the ground at the foot of those trees, with long twigs like osiers, having a small hook at the end. The twigs are sometimes from eight to ten feet long, so deep do these insects bury themselves in the ground".

Like so many of their predecessors, they were persecuted by the attentions of flies and mosquitoes. At Flood's Creek, on 17th December, "the horses perspired from their exertions to get rid of the mosquitoes". On the 23rd Sturt writes: "At this time the men generally complained of disordered bowels and sore eyes, but I attributed both to the weather and to the annoyance of the flies and mosquitoes". On 19th January, 1844, in describing the native huts, he tells how, "At whatever season of the year the natives occupy these huts they must be a great comfort to them, for in winter they must be particularly warm, and in summer cooler than the outer air; but the greatest benefit they can confer on these poor people must be that of keeping them from ants, flies and mosquitoes: it is impos-
sible to describe to the reader the annoyance we experienced from the flies during the day and the ants at night. The latter in truth swarmed in myriads, worked under our covering, and, creeping all over us, prevented our sleeping. The flies, on the other hand, began their attacks at early dawn, and whether we were in dense brush, on the open plain or the herbless mountain top, they were equally troublesome. On the present occasion Mr. Browne and I regretted we had not taken possession of the deserted huts, as, if we had, we should have got rid of our tormentors.

This is the first reference to the ants which were to prove the bane of future explorers of the centre. To describe the desolation of the Stony Desert, Sturt says: "The stillness of death reigned around us, no living creature was to be heard; nothing visible inhabited that dreary desert but the ant—even the fly shunned it..." On 1st October, at Cooper's Creek, "The 30th was a day of oppressive heat, and the flies and mosquitoes were more than usually troublesome. I have not said much of these insects in the course of this narrative, for, after all, they are secondary objects only", writes Sturt, with astonishing restraint, "but it is impossible to describe the ceaseless annoyance of these and a small ant. The latter swarmed in myriads in the creek and on the plains, and what with these little creatures at night and the flies by day, we really had no rest. I continually wore a veil, or I could not have attended to our movements or performed my duties. It is probable that being in the neighbourhood of water they were more numerous, but here they were a perfect plague, and in our depressed and wearied condition we, perhaps, felt their attacks more than we should otherwise have done. I was fairly driven down to the valley by the flies, as numerous on the burning stones on the top of the hill as anywhere else, and I left a knife and a pocket handkerchief behind me". This ant has not, however, as yet been satisfactorily identified, but it is stated by Mr. H. H. Finlayson (The Red Centre) to be a species of Camponotus. It is with the journeys of Giles, Forrest and Warburton that these baneful insects appear to dominate the life of the explorers.

While at Fort Mueller, from 20th November to 16th January, 1874, Giles tells how the place was infested with myriads of small black ants, flies and mosquitoes: "We are eaten alive with flies, ants and mosquitoes'. The enervating effect brought about by the tormenting attentions of these insects, and consequent loss of sleep, must be apparent to even the most casual reader. This is vividly described by Giles on 21st February while in the vicinity of the Petermann Range: "I was so bitten by the ants that I had to keep moving, but Jimmy lay sleeping and snoring (although swarmed over and almost carried away by the ants) as peacefully and calmly. Here was one human being, young and strong certainly, sleeping away the dreary hours, gaining the necessary vigour for the toils of the coming day, totally oblivious to swarms of creeping insects that not only crawled all over him, but kept constantly biting into his flesh; while another, who perhaps prided himself too much on the mental gifts bestowed by God upon him, was compelled by the same insects to wander through the whole night from rock to rock, unable to sleep..." The next day he was compelled to pass several hours in a rock pool to escape the ants.

A vivid picture is that of Giles struggling back to safety from Gibson's Desert, humping his keg of precious but rapidly dwindling water, when he writes: "Generally speaking, whenever I saw a shady tree there was an enormous bulldog ants' nest under it, and I was prevented from sitting in its shade".

While Forrest makes few references to these insect persecutors, Warburton's diary abounds in them. In September, 1873, his camels dying and gear discarded, Warburton writes: "The flies torment us; the ants nearly eat us up, and the Australian bee or honey fly stick to us most perseveringly. They don't sting, but they smell badly, which is perhaps why they persist in walking up our nostrils". On 8th October, while struggling in the sandhills and searching for water the ants still denied much-needed sleep.
By day or by night the little insects gave them no respite”. Warburton was a hard, experienced traveller, but from day to day we find the entries: “Our miseries are not a little increased by the ants. We cannot get a moment’s rest, night or day, for them...”

And so to the end of the journey. Warburton’s final reference to the ants adequately sums up the effect upon the travellers of their unceasing persecution. He tells how, “Not only were we thus compelled to seek our rest in the daytime, but the greatest annoyance perhaps of all was caused by those little insignificant insects, the ants; they gave us no peace. It was impossible to go on the shady side of the bush without being immediately covered. We could not sit down or attempt to write or make any calculations without being literally covered with these creatures. We had to travel all night and we could not sleep in the day, which was another thing that caused us to fall into such a miserable state.”

Apart from the ants and general references to flies and mosquitoes, Warburton mentions an ulcerous sore upon the back of one of the camels, which became fly-blown to such an extent that the maggots had to be scooped out with a ‘pint pot’.

The above account of our Explorers’ Insects is by no means exhaustive, but it will serve to indicate the wealth of information contained in the explorers’ journals concerning those species which attracted attention, and the part played by some of them in increasing the hardships, if not in actually retarding the mapping of our continent. I have as far as possible allowed the explorers to tell their own story, with a little comment as possible by myself.

BOOK REVIEWS

“The Australian Junior Encyclopaedia”, edited by Charles Barrett and Brian Harris. Georgian House, Melbourne, August, 1951, 2 vols., pp. xvi and xii + 998, 24 coloured plates, 8 maps, and 1,000 figs.

This fine encyclopaedia, though designed primarily for young people, will prove interesting and instructive to everyone. Apart from articles on domestic animals and palaeontology in volume one, zoologists will be interested in “Wonders of the Great Barrier Reef”, “Whaling in Southern Seas”, “The Old Sealing Days” and “Wealth in Australian Seas”. Natural History is extremely well catered for in volume two, which contains articles on a variety of Australian animals by well-known zoologists, well illustrated with coloured plates and in black and white.

“Ichthyological Notes, No.1”. By T. C. Marshall, Dept. of Harbours and Marine, Brisbane, 1951, pp. 1-9, pls. i-iii.

It is pleasing to welcome a new zoological publication, this time one devoted to the fishes—and presumably other forms of marine life—of Queensland. Mr. Tom Marshall has built up a fine collection of fishes in the Edward Street headquarters of the Department of Harbours and Marine, Brisbane, of which he is Ichthyologist, and in this, the first of a proposed series of papers, he records some of special interest or rarity. There are good illustrations by George Coates and Rose Cox. Such work will be of lasting value and interest not only to ichthyologists, but to naturalists and fishermen generally, and so we wish “Ichthyological Notes” continued success.


Dr. F. S. Bodenheimer, who is Professor of Zoology at the Hebrew University Jerusalem, has, in this remarkably interesting book, gathered
together the widely scattered references to the use of insects as food by man. Hitherto regarded purely as a gastronomical curiosity, the eating of insects attained some importance during World War II., when members of the armed forces were taught how to "live off the country"; it is now regarded as "the key to the true interpretation of the puzzling results obtained by a number of physiologists who have studied the diets of tropical races and found them to be deficient in animal proteins and fats, and yet the people were fit and obviously adequately fed. The constant eating of termites, caterpillars, locusts, etc., in substantial quantities was not taken into account . . ." It is notable that some of these insect foods are rich in essential vitamins.

To Australians, particular interest attaches to a large section of the book devoted to the insect foods of our aborigines, which provides the most complete summary of the existing literature published to date. In comparison with the peoples of other lands it is remarkable how little the termites and locusts were exploited by our natives. The use of these sources of food is fully discussed elsewhere in the book, together with honey and honey-hunting, the Biblical manna, and many other entomological by-paths.

Dr. Bodenheimer is to be congratulated on having produced a book not only comprehensive in scope, but extremely fascinating reading. It is heartily recommended to entomologists and others who take a wide interest in natural science.

One point only emerges for criticism. In a book covering so much detail an index is an essential; unfortunately this aid to reference is lacking. This omission will, it is hoped, be rectified in a future edition.

K. C. McK.


The issue of the third volume of Dr. Hyman's textbook will be welcomed by systematists and senior students in zoology since it completes the author's survey of those non-coelomate invertebrates not already dealt with in the second volume of this series. The groups concerned are the Phyla Acanthocephala, Aschelminthes (which includes Rotifera, Gastrotricha, Kinorhyncha, Priapulida, Nematoda and Nematomorpha), and Entoprocta.

As Dr. Hyman herself remarks, her scheme of classification differs somewhat from any previously published. For instance, she has removed the group Acanthocephala from the Phylum Aschelminthes (Phylum Nemathelminthes of Kukenthal-Krumbach) and raised it to the rank of a phylum in its own right. She follows A. H. Clark in removing the Entoprocta from the phylum Bryozoa and giving it the rank of a phylum also.

Volume III. is a direct continuation of the previous volume and really should not be read apart from the opening section of that book, for in it is a general introduction and a discussion of the origins and affinities of the pseudocoelomate bilateria. As in the previous volume, the author gives a historical account of each phylum and then sets out the classification of the group and deals with its morphology, phylogeny and physiology most clearly. Extensive bibliographies are quoted for each group and are, in themselves, very valuable.

This scholarly work, which has been illustrated by the author herself, will no doubt become a reference book wherever systematists and senior students of zoology have to study those groups of animals with which the book deals.

E. C. Pope.
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